Chapter 15
Castles Built on Clouds: Vague Identity and Vague Objects

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15.1 Evans's Argument Stated

Evans's 1978 article is entitled 'Can There Be Vague Objects?' and opens with the following passage:

> It is sometimes said that the world might itself *be* vague. Rather than vagueness being a deficiency in our mode of describing the world, it would then be a necessary feature of any true description of it. It is also said that amongst the statements which may not have a determinate truth value as a result of their vagueness are identity statements. Combining these two views we would arrive at the idea that the world might contain certain objects about which it is a *fact* that they have fuzzy boundaries. But is this idea coherent? (Evans 1978, p. 208)

Evans then presents the following argument:

(1) $\nabla(a = b)$
(2) $\lambda x \, [\nabla(x = a)] \, b$
(3) $\sim\nabla(a = a)$
(4) $\sim\lambda x \, [\nabla(x = a)] \, a$
(5) $\sim(a = b)$

'∇' is a sentential operator that is to be read 'it is indeterminate whether'. (1) is an assumption for *reductio*. (3) is supposed to be self-evident. (2) is supposed to follow from (1), and (4) from (3), by property abstraction. And (5) is supposed to follow from (2) and (4) by an application of (the contrapositive of) Leibniz's Law. It is clear from the title of Evans's paper and the passage quoted above that Evans himself takes this argument to establish both that there cannot be identity statements that are indeterminate for ontic reasons and that there cannot be vague objects. As we will

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see, the argument does not establish either of these conclusions. But it does establish another important conclusion, namely, that identity *itself* cannot be vague. And we take this to be the main lesson that Evans wishes to impart.

Identity itself can be vague iff identity statements can be indeterminate *in virtue of* the vagueness of identity. To see what this means, first consider that one can hold that an identity statement is indeterminate for a number of reasons. One can hold that it is indeterminate because either (or both) of the terms flanking the identity sign is referentially indeterminate. To do so is to hold that it is indeterminate *in virtue of* the referential indeterminacy of (at least one of) its singular terms. One can also hold that an identity statement is indeterminate because we are irremediably ignorant about its truth-value. To do so is to hold that it is indeterminate *in virtue of* our epistemic limitations. But suppose that we have an identity statement that is indeterminate, but for neither of the reasons above. Then, it seems, the only place left to locate the source of its indeterminacy is in the identity that it expresses. Thus, the view that identity itself can be vague is a negative thesis; it is the view that identity statements can be indeterminate, but not in virtue of referential indeterminacy or our epistemic limitations. Evans's argument is directed at those who believe that identity itself can be vague. (1) is supposed to be a representative expression of this view. So '∇' is to be taken as a non-epistemic operator and '*a*' and '*b*' to be referentially determinate.

15.2   Resisting Evans's Argument

How might the defender of the view that identity itself can be vague resist Evans's argument? Note once more that (1) is an assumption for *reductio*, (2) is supposed to follow from (1) by abstraction, (4) is supposed to follow from (3) by abstraction, and (5) is supposed to follow from (2) and (4) by (the contrapositive of) Leibniz's Law. So, there are only four possible ways to resist the argument:

(i) By denying premise (3)
(ii) By rejecting one or both abstraction steps
(iii) By rejecting (the contrapositive of) Leibniz's Law
(iv) By denying that the argument is a genuine case of *reductio*

Of course, it is possible to consistently take any of these ways and so resist Evans's argument. But this should not be surprising. *Any* argument can be resisted somehow. One could take way (iv), for example, by adopting dialetheism and claiming that the assumption and conclusion of the argument constitute an example of a true contradiction. But because dialetheism is far more controversial than the thesis that identity itself cannot be vague, unless one has independent reasons for endorsing dialetheism, to resist Evans's argument in this way would be inapposite. The conclusion of Evans's argument is not an unpalatable one, so one cannot reasonably reject otherwise plausible assumptions purely in order to resist it.

Williams ([2008]) makes just this point and identifies the following conditions (amongst others) that any way of resisting Evans's argument must meet if it is to be acceptable:

A. Classical logic should be preserved.
B. 'Properties' should be taken in a thin or 'merely abundant' sense; so even if there is no Armstrongian Universal corresponding with 'being identical with a', there is still (in standard cases) a property accurately so described.
C. Leibniz's Law (the principle of the indiscernibility of identicals) [and its converse] should be recognised as holding.
D. The logic of 'indeterminately' is to be S5; a consequence of this is that if something is indeterminate, it is determinate that it is indeterminate (Williams [2008], p. 136).

Williams goes on to justify these conditions (see pp. 136–138). We do not repeat those justifications here but merely signal our agreement with Williams about these conditions and note that they immediately rule out most of the possible ways of resisting Evans's argument (and with them nearly all of the published responses to Evans's argument).[1] Way (iii) of resisting the argument is obviously immediately ruled out by C. The most obvious way of developing way (ii) (namely, by claiming that $\lambda x \, [\nabla(x = a)]$ is not a genuine property) is immediately ruled out by B. Way (iv) is ruled out by D. One might deny that (1) contradicts (5) as each stands, but in the presence of the characteristic S5 axiom mentioned by Williams above, the argument can be strengthened so that $\sim\nabla(a = b)$ can be derived from $\nabla(a = b)$.[2] D (along with A) also rules out way (i), for it is an axiom of S5 that all theorems of classical logic are determinately true. (Indeed, this is also an axiom of S4, and even the much weaker T.) All instances of the schema $(\alpha = \alpha)$ are theorems of classical logic, whence it follows from D that $\Delta(a = a)$ is true, and this of course is equivalent to $\sim\nabla(a = a)$. In fact, quite independently of D, we consider the truth of premise (3) to be unimpeachable. The very concept of an individual is tied up with the notion of self-identity. No individual can fail to be self-identical. So (3) cannot fail to be true. Thus, even if one adopts a non-standard modal logic in which the axiom mentioned above is rejected, we do not think one can reject premise (3).[3]

Given the above conditions, the only remaining possible way of resisting Evans's argument (to defend the view that identity itself is vague) is to develop way (ii)

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[1]To give just a few examples, the responses to Evans's argument given in each of the following rely, in one way or another, on the rejection of one of the conditions A to D and are thus immediately ruled out as admissible responses on our view: Broome ([1984]), Cook ([1986]), Johnsen ([1989]), Garrett ([1991]), Parsons and Woodruff ([1995]), Copeland ([1997]), Parsons ([1987], [2000]), Lowe ([2005]), French and Krause ([1995], [2003], [2006]), van Inwagen ([1988], [1990], [2009]), and Cowles and White ([1991]) (the response given in this last paper is explicitly directed at Pelletier ([1989]) but is also applicable to Evans's argument). (See also fn. 7 for additional comments on French and Krause ([1995], [2003], [2006]).)

[2]See Heck ([1998], pp. 282–283) for precisely how to derive $\sim\nabla(a = b)$ from $\nabla(a = b)$.

[3]See also fn. 7 below for more on this.

somehow. There are, so far as we know, only two places in the published literature where anyone has attempted this.[4] The first is Lowe (1994, 1997, 1998), and the second Barnes (2009). So (given conditions A–D above), in order to defend Evans's argument, all that remains is to reject Lowe's and Barnes's arguments, to which we now turn.

15.3   Lowe's Denial of Abstraction

Lowe's original argument for his denial of the abstraction steps in Evans's argument is in his 1994 'Vague Identity and Quantum Indeterminacy'. He asks us to consider the property $\lambda x\,[\nabla(x = b)]$. This property, he argues, is symmetrical to the property ascribed to b in (2) (i.e. $\lambda x\,[\nabla(x = a)]$) because it differs from it only by permutation of 'a' and 'b'. By parity of reasoning, if b possesses $\lambda x\,[\nabla(x = a)]$, a must possess $\lambda x\,[\nabla(x = b)]$. But given the premise that it is indeterminate whether $a = b$, he argues, it must be indeterminate whether these two properties are identical. So it cannot be right to say, as (4) does, that a does *not* possess $\lambda x\,[\nabla(x = a)]$. Thus, Lowe argues, the step from (3) to (4) must be an illegitimate one.

Two responses can be given to this argument. The first is that even if the argument succeeds, it does so only for cases that involve only identity-involving properties. But concrete examples of supposed vague identity invariably involve features that allow us to apply Evans-style arguments without making use of identity-involving properties. We first illustrate this using Lowe's own example.

Example: Lowe's Electrons

Electron a is free at time t_0 and whizzing around an ionisation chamber. At time t_1 it becomes trapped by a helium atom (whereupon the atom becomes a negative helium ion) and enters into a superposed state with the two other electrons within it. At a later time t_2, electron b is emitted by the atom (whereupon the atom returns to a neutral state).

Here 'a' and 'b' are supposed to refer to single electrons, but it is also supposed to be indeterminate whether $a = b$. There are a number of ways in which an Evans-style argument that makes no reference to identity-involving properties can be utilised here. Here is one way:

(1) $\nabla\,(a$ is emitted at $t_2)$
(2) $\lambda x\,[\nabla\,(x$ is emitted at $t_2)]\,a$

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[4]Some of the papers cited in fn. 1 above do also reject one or both of the abstraction steps in Evans's argument. But where they do so, they do so not for independent reasons, but on the basis of one of the other rejected ways of rejecting Evans's argument. For example, Parsons (2000, ch. 4) argues that the abstraction step from (1) to (2) fails *because* there is no property of 'being indeterminately identical with a' (see pp. 50–52). Lowe and Barnes, by contrast, offer independent reasons for rejecting the abstraction steps that (at least *prima facie*) do not rely upon a prior commitment to one of the other rejected ways of rejecting Evans's argument.

(3) $\sim\nabla$ (b is emitted at t_2)
(4) $\sim\lambda x$ [∇ (x is emitted at t_2)] b
(5) $\sim(a = b)$

Here no property can be constructed that is symmetrical to the one ascribed to a in (2), so Lowe's argument does not apply.

Lowe's example is quantum mechanical. But nothing hangs on this. A second illustration of this style of argument is Hawley's (2001: pp. 118ff.) application of it to van Inwagen's fiendish Cabinet thought experiment (van Inwagen 1990, Ch. 18):

Example: van Inwagen's Cabinet
   A person, Alpha, steps into a fiendish Cabinet at t_1, which then disrupts those features, whatever they are, that are relevant to personal identity. Later at t_2 someone, Omega, steps out.

Here it is supposed to be indeterminate whether Alpha is Omega. Hawley gives the following Evans-style argument for their distinctness:

(1) It is indeterminate whether Alpha steps out of the Cabinet.
(2) Alpha is such that it is indeterminate whether she steps out of the Cabinet.
(3) It is not indeterminate whether Omega steps out of the Cabinet.
(4) Omega is not such that it is indeterminate whether she steps out of the Cabinet.
(5) So, Alpha is distinct from Omega.

Again, Lowe's argument does not apply.

Lowe replies to this response in his 1997 'Reply to Noonan on Vague Identity'. He argues that *at t_2 it is indeterminate whether a has been emitted* (in the electron example) but that *at t_1 it is indeterminate whether b is going to be emitted*. He then goes on to say:

> We have to remember that the names 'a' and 'b' have been introduced with an implicit time reference built into them: a has been introduced as the *captured* electron and b as the *emitted* electron ... Granted that there is a property that is assignable to a in virtue of the fact that at t_2 it was indeterminate whether a had been emitted from the atom, we can nonetheless see that there is no reason to suppose that this property is determinately distinct from the property that is assignable to b in virtue of the fact that at t_1 it was indeterminate whether b was going to be emitted from the atom. Consequently, a's possession of that 'first' property can provide no reason for thinking that a determinately differs in at least one of its properties from b. (Lowe 1997, p. 90)[5]

The difficulty with this reply is that it is just false to say at t_1 that it is indeterminate whether b will be emitted (mutatis mutandis, in Hawley's case that Omega will step out). If the reference of the name 'b' is fixed by the description 'the emitted electron' (or the reference of 'Omega' by 'the person who steps out'), then b is the emitted electron (Omega is the person who steps out), but it is not correct

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[5]Again, nothing hangs on the fact that the example is quantum mechanical. Lowe does not think this reply appropriate only with respect to employment of the non-identity-involving property style of argument in quantum mechanical examples. He would give the same reply to Hawley.

to say at t_1 that it is indeterminate whether the emitted electron (the person who steps out) is going to be emitted (is going to step out). So it is equally not correct to say that it is indeterminate whether b (Omega) is going to be emitted (step out). Lowe says in the passage quoted, 'we have to remember that the names "a" and "b" have been introduced with an implicit time reference built into them'. It is this, we think, that has misled him. All that is true is that the names 'a' and 'b' (and 'Alpha' and 'Omega') have had their references fixed by descriptions which identify their denotata by properties which they (the denotata) only possess at certain times. But this makes them no different from any other name whose reference is fixed by such a description, and insofar as the references of names are fixed by descriptions, it will typically be by appeal to such descriptions that their references are fixed. (Maybe the reference of 'Einstein' can be fixed by the description 'the creator of the Special Theory of Relativity' – no need to say when he created it; but most people are no Einsteins, with such unique and time-independent achievements; rather they are known by, and can only be identified by, properties which involve reference to time. Who is John Major? The man who led the Conservative Party to electoral disaster? No, that has been done before. He is the man who led the Conservative Party to electoral disaster *in 1997*. The case is entirely typical.)

Lowe returns to the topic in his book (1998, pp. 67–69) and replies slightly differently. But the modified reply still exhibits a confusion about historical properties. A historical property, like being a mother, may be had at some time and not at another (earlier) time. A woman becomes a mother when she gives birth. So suppose Mary gave birth in 1950. Then in 1960 it was correct to say 'Mary gave birth in 1950'. But in 1940 it was not correct to say 'Mary gave birth in 1950' (but only, 'Mary will give birth in 1950'). However, the form of words 'In 1960, Mary gave birth in 1950' is meaningless. It is to just such a meaningless form of words that Lowe appeals in his modified reply. The argument he is opposing is that at t_2 one can correctly assert that it is indeterminate whether b was captured at t_1 (Omega stepped in at t_1) and correctly deny that it is indeterminate whether a was captured at t_1 (Alpha stepped in at t_1). Lowe objects that no mention of the time at which this property is allegedly had by b has been made. But there is no need to mention an additional time. Lowe suggests that what should be said is 'at t_2, b has the property of being such that it is indeterminate whether it was captured by the helium atom at t_1'. But this is comparable to the meaningless 'In 1960, Mary gave birth in 1950'.[6]

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[6]Lowe again returns to the topic of vague identity in his 2005 'Identity, Vagueness, and Modality', developing earlier material (from his 1982), though he does not specifically discuss the variant of Evans's argument which appeals only to non-identity-involving properties. His main claim in this paper is that the Evans argument, like the Barcan-Kripke argument for the necessity of identity, involves a transition (in the Evans argument in the move from (3) to (4)) from an ascription to an object a of the property of being determinately/necessarily self-identical to an ascription to a of the property of being necessarily identical to a, but that this transition is illegitimate since these are different properties (everything has the first, only a has the second). The flaw in Evans's argument (and mutatis mutandis in the Barcan-Kripke argument) which he thinks this reveals is that (3) and (in the Barcan-Kripke argument) '$\Box(a = a)$' are ambiguous between two modally

The first response to Lowe's (original) argument might save the spirit of Evans's argument, but it does not save the letter of it. Whether this matters depends on whether concrete cases of vague identity that involve only identity-involving properties can be described. We are not convinced that they can be, but offer no argument for this here because the second response to Lowe's argument does save the letter of Evans's argument. (If this is so, why do we bother giving the first response? Because its main point will be important later.) Lowe claims that he is rejecting the abstraction step from (3) to (4). But he must also reject the abstraction step from (1) to (2) and, ultimately, premise (3) itself. To see why note that in giving his argument Lowe first assumes that the abstraction step from (1) to (2) is legitimate. It is only because he makes this assumption that he is able to maintain on the basis of (1) that b possesses $\lambda x\,[\nabla(x=a)]$. He then claims that $\lambda x\,[\nabla(x=a)]$ and $\lambda x\,[\nabla(x=b)]$ are indeterminately identical and so claims that it is not right to say that a does *not* possess $\lambda x\,[\nabla(x=a)]$, which renders the abstraction step from (3) to (4) illegitimate. But suppose we reason in the opposite direction. Suppose we assume that the abstraction step from (3) to (4) is legitimate, and so assume that a does not possess $\lambda x\,[\nabla(x=a)]$. Then we can conclude that b does not possess $\lambda x\,[\nabla(x=b)]$. So, from the claim that $\lambda x\,[\nabla(x=a)]$ and $\lambda x\,[\nabla(x=b)]$ are indeterminately identical, we can conclude that it is not right to say that b possesses $\lambda x\,[\nabla(x=a)]$, which renders the abstraction step from (1) to (2) illegitimate instead. If Lowe's argument is sound, so is this one, and so the abstraction steps cannot both be true. But neither of these arguments, in the presence of the other, can give us reason to deny one of the abstraction steps rather than the other. So, both must be rejected.

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non-equivalent readings, one ascribing to a the property of being determinately/necessarily self-identical and the other ascribing to a the property of being determinately/necessarily identical to a. (As he notes, he has to make this ambiguity claim since he must deny the validity of the 'stripped down' Evans argument which omits steps (2) and (4) and the original Kripkean formulation of the Barcan-Kripke argument (2005, p. 305).) Despite the obvious non-identity of the properties, the supposed non-equivalence seems difficult to defend. Suppose a possesses the property of being determinately/necessarily self-identical. Then it is a determinate/necessary truth that a possesses the property of being self-identical. But if a has the property of being self-identical, then a has the property of being identical to a. That is also a determinate/necessary truth. Whence we can conclude that it is a necessary truth that a has the property of being identical to a (not just the distinct property of being self-identical, which everything has). So a has the property of being necessarily identical to a. Whatever may be said about this argument, the response to Evans in Lowe's 2005 paper is different from the one presently under discussion in this section and, in fact, is a version of way (i) of responding to Evans listed above (i.e. not accepting the determinate truth of (3)) which is why we list Lowe's 2005 paper in fn. 1 above.

The other development in Lowe's 2005 paper is that he now denies that the names 'a' and 'b' in the electron example make determinately identifying reference. But he insists that these terms could not be made determinate by precisification. If he is right, then this is another example of what we emphasise the possibility in Sect. 15.5 below – singular terms which are referentially indeterminate but not on account of semantic indecision. But as Williams (2008) explains, the possibility of such cases (of 'ontically induced') referential indeterminacy is no objection to Evans.

Now, Lowe does not deny that $\lambda x\,[\nabla(x=a)]$ is a genuine property. Rather, he denies that it is determinately distinct from $\lambda x\,[\nabla(x=b)]$. But if it is a genuine property, there should be some fact of the matter regarding b's possession of it. According to the reasoning above, we cannot conclude on the basis of $\nabla(a=b)$ that b *possesses* $\lambda x\,[\nabla(x=a)]$. But given that $\nabla(a=b)$, surely it cannot be that b *fails* to possess it. So why *can't* we conclude that b possesses it on the basis of $\nabla(a=b)$? The answer must be that, on Lowe's view, the most that we can conclude on the basis of (1) is that it is indeterminate whether b possesses $\lambda x\,[\nabla(x=a)]$. And so, by parity of reasoning, it must be indeterminate whether a possesses λx $[\nabla(x=b)]$ too. But given that the properties are not determinately distinct, it must therefore also be indeterminate whether a possesses $\lambda x\,[\nabla(x=a)]$. But if it is indeterminate whether a possesses $\lambda x\,[\nabla(x=a)]$, then it cannot be determinately true that $\sim\nabla(a=a)$. So, ultimately, Lowe must also reject premise (3). As we have already argued that premise (3) is beyond reproach, we reject Lowe's argument on this basis. This does not, of course, offer a diagnosis of what is wrong with Lowe's argument. But we think the matter is clear enough. Despite Lowe's claim to the contrary, '$\lambda x\,[\nabla(x=a)]$' and '$\lambda x\,[\nabla(x=b)]$' must pick out properties that are determinately distinct.[7]

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[7]French and Krause have, in various places (e.g. 1995, 2003, 2006), defended the view that in quantum mechanical cases such as the one that Lowe describes, it is indeterminate whether the particles involved are identical. Unlike Lowe, however, they explicitly endorse the view that such quantum particles are non-identical with themselves (they refer to particles with such a characteristic as 'non-individuals') (1995, p. 24; 2003, p. 109; 2006, p. 143). This does allow them to respond to Evans's argument, but in a way that we have explicitly rejected (i.e. way (i) – by rejecting premise (3)). Above we said that it is dialectically inappropriate to deny premise (3) purely in order to reject Evans's argument. But French and Krause take themselves to have independent reasons for rejecting premise (3) with regard to quantum particles – that is, they think that considerations from quantum mechanics itself strongly support the view that quantum particles are non-individuals. To consider French and Krause's arguments for this claim in any detail would take us beyond the scope of the current essay. But briefly, we do not think French and Krause are right about this. French and Krause's main argument for the conclusion that quantum particles are non-individuals, and so indeterminately identical with each other and non-identical with themselves, is in effect that such particles are absolutely indistinguishable (i.e. that they share all of their non-identity-involving properties) (2003, p. 99; 2006, ch. 4). But we simply do not see why we are supposed to conclude that two entities are indeterminately identical, and so non-identical with themselves, from the fact that they are indistinguishable. And even prescinding from this, we have further worries about French and Krause's view. For one, it is difficult to see how it is possible to secure determinate reference to a non-individual in the first place. And secondly, if it is true that for some quantum particle a, that it is not the case that $a=a$, then how can it be indeterminate, for some quantum particle b, whether $a=b$ (for surely, if it is not the case that $a=a$, then it should also be that it is not the case that $a=b$). But whether or not these latter worries amount to anything, we do reject the view that anything can fail to be self-identical, and can see no reason to revise our opinion based on quantum mechanical considerations. So we reject French and Krause's response to Evans's argument along with all other responses that deny premise (3).

15.4   Barnes's Denial of Abstraction

Barnes, in giving her argument for rejecting the abstraction steps in Evans's argument, first gives an interpretation of the determinacy operators wherein they are considered to be quantifiers that range over the possible worlds that are admissible precisifications of the actual world (Barnes 2009, pp. 83–85). Her thought is that if identity itself is vague, then (because this is a species of ontic vagueness) the world itself is vague, so there will be many precise ways that the world could have been, and it will be indeterminate whether the world itself is one of those ways. Thus, ΔP iff P is true in all possible worlds that are admissible precisifications of the actual world or false in all possible worlds that are admissible precisifications of the actual world, and ∇P iff P is true in some, but not all, possible worlds that are admissible precisifications of the actual world. The result is that if there is vagueness in the actual world with regard to any P, then there are (at least) two possible worlds in the space of (admissible) precisifications, one of which represents the world as being P and one of which represents the world as being not-P.

In Evans's argument, it is crucial that the predicate '$\lambda x\ [\nabla(x = a)]$' picks out the same property when used in (2) as it does when used in (4). But Barnes proposes that we read *de re* property ascriptions that are prefixed with the determinacy/indeterminacy operator in a counterpart-theoretic manner. So, because in counterpart theory *de re* modal predication is inconstant, if we do so, then the predicate '$\lambda x\ [\nabla(x = a)]$' picks out a different property in (2) from the property it picks out in (4) (2009, pp. 89–93). Taking counterparts of actual individuals to be individuals from worlds that are admissible precisifications of the actual world, when prefixed to 'b', Barnes argues, '$\lambda x\ [\nabla(x = a)]$' refers to the property *having some b-counterparts that are a-counterparts and some b-counterparts that are not a-counterparts*, but when prefixed to 'a' it refers to the property *having some a-counterparts that are a-counterparts and some a-counterparts that are not a-counterparts*. So, premise (2) of Evans's argument now says that b has the former property and (4) says that a lacks the latter property. Evans's argument would still go through if a and b differed over whether they have *these* properties – but they do not. Just as b has the former property, so does a, and just as a lacks the latter property, so does b.

All of the above should sound quite familiar to those who know the literature on contingent identity.[8] The response isn't just analogous to the response given by the defender of contingent identity – it *is* that response with the modal quantifiers restricted to precisifications. Barnes, of course, is fully aware of this and in fact presents her account as standing or falling with that of the contingent identity theorists:

> Indeterminate identity simply is contingent identity, where 'contingency' here is the contingency defined on the restricted necessity that is determinacy. Thus, any vindication

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[8]For those who do not, see Gibbard (1975) for a classic introduction.

of the coherence of (absolutely) contingent identity will automatically yield a vindication of the coherence of indeterminate identity. The coherence of both stands or falls together. (Barnes 2009, p. 93)

However, we think that Barnes obscures the real issue here. It is true that if either of the accounts above is *consistent*, then so is the other, and if either is *inconsistent*, then so is the other. But the real question is whether the account Barnes develops deserves the name she bestows upon it. It is one thing to develop a consistent account that diagnoses a fallacy in the Evans argument, and quite another to develop a consistent account that diagnoses a fallacy in the Evans argument *and* deserves to be called an account of vague identity. We are in no doubt that Barnes achieves the first of these things, but we do not think that she achieves the second.

To see this, first consider contingent identity again. The thought that an object *a* is contingently identical to an object *b* is the thought that *a* and *b are* identical, but that they might not have been identical (and, in general, the thought that an object *a* is contingently *F* is the thought that *a* is *F*, but might not have been). Anyone wishing to defend contingent identity has to respect this thought. If they fail to do so, no matter whether their account is consistent or not, it will not deserve to be called an account of contingent identity. To illustrate this idea further, first note that by replacing the delta operator '∇' in Evans' argument against indeterminate identity with an operator 'C' that is read 'it is contingent whether', we can obtain an exactly parallel argument against contingent identity:

(1) $C\,(a=b)$
(2) $\lambda x\,[C\,(x=a)]\,b$
(3) $\sim C\,(a=a)$
(4) $\sim \lambda x\,[C\,(x=a)]\,a$
(5) $\sim (a=b)$[9]

Suppose one responds to this argument by diagnosing a subtle fallacy, but that in order to make the diagnosis one ends up being committed to the claim that all instances of contingent identity are cases in which *a* and *b* actually designate *distinct* objects. In making such a reply, one wouldn't necessarily have made any logical error – but one would have changed the subject. One's account will not deserve to be called an account of contingent identity. Of course, by adopting a counterpart-theoretic account of modal predication, contingent identity theorists can identify a fallacy in the argument without having to change the subject in this way. According to their account, when an object *a* and an object *b* are contingently identical, they actually share all properties (including modal ones) and so turn out to be *actually* identical.

But now consider Barnes's so-called account of vague identity. Precisely because it is modelled on the contingent identity account, Barnes is committed to the view

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[9]That this is so is by no means a new insight. Noonan (1991) makes just this point. Incidentally, in that paper it is also argued that one cannot respond to Evans's argument in a counterpart-theoretic manner (see p. 191).

that whenever we have a case such that it is indeterminate whether an object *a* and an object *b* are identical, then it might be that *a* and *b* are *actually* identical. That is, the truth of 'it is indeterminate whether *a* = *b*' is consistent with the truth of '*a* = *b*'. But this, we think, *does* change the subject. The claim that an identity statement '*a* = *b*' is indeterminate due to the vagueness of identity itself precludes the actual identity of *a* and *b* (and in general the claim that '*a* is *F*' is indeterminate due to ontic vagueness precludes the actual truth of '*a* is *F*'). If identity itself is vague, then it must be that *a* and *b* are *not* actually identical, *nor* actually non-identical. So, we think that even though Barnes produces a consistent account that Evans's argument does not refute, we do not think that it deserves to be called an account of vague identity.

That completes our defence of Evans's argument. We thus endorse the conclusion that identity itself cannot be vague.

15.5   Ontic Indeterminacy of Identity Survives

Evans's argument establishes that identity cannot be vague, and so that if a statement of identity is indeterminate in truth-value one of the terms flanking the identity sign must be referentially indeterminate. Evans's article is, of course, in fact entitled 'Are there vague objects?' It clearly never occurred to him that someone might take on board its lesson but endorse the possibility of vague objects, but to many subsequent authors it has seemed evident that there is no inconsistency in this position. A vague object is not an object with indeterminate identity. It is an object, such as the eponymous cloud, with indeterminate boundaries and it seems obvious that Evans's argument cannot show that vague objects, so defined, are impossible (e.g. Edgington 2000; Tye 2000). Even if the argument succeeds, it seems, all it can establish is that every vague object is determinately distinct from every precise object and every other vague object. So it is consistent to hold both that there are vague objects and that the identity relation is precise – in the sense that in any identity statement of indeterminate truth-value, one of the terms flanking the sign of identity must be indeterminate in reference between several, possibly vague, candidate referents.

Furthermore, Evans's argument does not, at least by itself, establish that either of the following two theses is false:

1. Identity statements can be indeterminate for ontic reasons.
2. Identity statements can be indeterminate *in virtue of* the existence of vague objects.

One might think that theses 1 and 2 amount to the same thing. But they do not. In this section, we first show, by drawing upon Williams (2008), how the existence of vague objects can give rise to indeterminate identity statements in a way that is consistent with the soundness of Evans's argument. We then show that there can be ontic indeterminacy that involves only *precise* objects and that gives rise to indeterminate identity statements in a way that is consistent with the soundness

of Evans's argument. In the sections that follow, we offer supplementary arguments to show that vague objects cannot, after all, exist (i.e. that thesis 2 is false). But the supplementary arguments will not show that there cannot be ontic indeterminacy that involves only precise objects, and so will leave thesis 1 standing.

Above we said that the terms 'a' and 'b' are to be taken as being referentially determinate in Evans's argument. If instead we take either (or both) terms to be referentially indeterminate, it is easy to show that the abstraction steps fail and so that the argument is invalid. If 'b' is referentially indeterminate, for example, it does not follow from $\nabla(a = b)$ that there is some object that satisfies the predicate '$\lambda x [\nabla(x = a)]$', and a fortiori it does not follow that b does. It is perhaps easiest to see that this is so by considering a concrete example (the example is due originally to Shoemaker (Shoemaker and Swinburne 1984: 146)):

Example: Alpha Hall and Beta Hall

Jones is lecturing in Alpha Hall. Alpha Hall is linked by a flimsy walkway to Beta Hall in such a way that is unclear whether Alpha Hall and Beta Hall count as two distinct buildings or merely as two parts of one and the same building.

It is clear that here the identity statement 'The building in which Jones is lecturing is identical to Alpha Hall' is indeterminate in truth-value. But it also seems perfectly clear why this is so. The term 'building' is such that it is indeterminate whether it applies to the whole structure or just to the two halls. So, it is indeterminate what 'the building in which Jones is lecturing' denotes. There are two perfectly precise candidates for the denotation of the term, namely, Alpha Hall itself, or the structure consisting of Alpha Hall and Beta Hall. But neither of these perfectly precise things is such that it has the property of being indeterminately identical to Alpha Hall. The first is determinately identical to it, and the second determinately non-identical. So the abstraction step fails.

According to the most well-known account of the phenomenon, referential indeterminacy is a matter of semantic indecision. The world contains only precise objects, but we have not fully fixed the application conditions of our terms, so that in certain cases it is indeterminate which precise objects they apply to. So, the reason why the term 'the building in which Brown is lecturing' is referentially indeterminate is that we have just not decided how to apply the general term 'building' in this case. The application conditions of the general term are such that in borderline cases like this they supply no determinate answer to questions regarding their application. On this view, however, if we liked, we could precisify our terms by laying down more precise application conditions that do supply answers in all cases.

The above account has dominated the literature on semantic indeterminacy, and many seem to assume that it is the *only* account of referential indeterminacy available. But it is not. This is what Williams (2008) makes clear. If we suppose that there can be vague objects, namely, objects that are such that it is indeterminate where their boundaries are, then referential indeterminacy can arise without semantic indecision. Williams gives an example involving identity over time to illustrate the point in his 2008 'Multiple Actualities and Ontically Vague Identity', but that it involves identity over time is not an essential feature of the example and in fact

adds extra complications. In a later paper, Barnes and Williams (2009, p. 181) give a synchronic example to illustrate the point that serves just as well, so here we use that example.

Example: Table and Front

Table is a vague object and it is ontically indeterminate whether it is located between you and Wardrobe or in another room. 'Front' is a name introduced to refer to whatever object is in front of you. 'Front' is thus referentially indeterminate between Table and Wardrobe, and thus the identity statement 'Table = Front' is indeterminate in truth-value.

Here, then, we have an example of an identity statement that is indeterminate in virtue of the existence of a vague object that is consistent with the soundness of Evans's argument.[10]

The above kinds of case arise because, as Lewis (1984) has argued, reference is both a matter of what we do to fix the meanings of the terms we use and the way the world is. Sometimes, as the defender of semantic indecision maintains, referential indeterminacy arises because we have not done enough: 'our reference-fixing procedures fail to isolate one amongst a range of suitable candidates' (Williams 2008, p. 147). But it is also possible that we have done all that we can, but that we still fail to refer determinately because the world does not play its part. Such cases will be cases of ontic indeterminacy of reference. Williams seems to think that ontic indeterminacy of reference can only arise in the kind of way he describes, that is, in virtue of the existence of vague objects. But this, we think, is false. Ontic indeterminacy of reference can arise even in the absence of vague objects. And when it does it can also give rise to identity statements that are indeterminate in a way that is consistent with the soundness of Evans's argument.

Consider the following suggestive passage from Quine (drawn to our attention by Greenough (2008)):

Where to draw the line between heaps and non-heaps . . . or between the bald and the thatched, is not determined by the distribution of microphysical states, known or unknown it remains an open option . . . On this score the demarcation of the table surface is on a par with the cases of heaps and baldness. But it differs in those cases in not lending itself to any stipulation, however arbitrary, that we can formulate; so it can scarcely be called conventional. It is neither a matter of convention nor a matter of inscrutable but objective fact. (Quine 1981, p. 94)

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[10]Vague objects, if such there be, must be weird. But Table is very weird indeed. An example due originally to Hawley (2002) provides us with a (comparatively) less weird example:

Example: Hawley's Mouse

Algernon and Socrates are two mice in a cage. Whilst Socrates is a perfectly precise mouse, Algernon is a vague object. Algernon's vagueness consists in indeterminacy in whether his tail, which is hanging by a thread, is a part of him. It may then be that 'the largest mouse in the cage' is indeterminate in reference between Algernon and his more fortunate companion Socrates with an intact, but shorter, tail. So, the identity statement 'the largest mouse in the cage = Socrates' is indeterminate in truth-value.

This passage is drawn from a discussion of bivalence, and Quine goes on to say that if we commit ourselves to bivalence, then we are committed to 'treating the table as one and not another of this multitude of imperceptibly divergent physical objects' (ibid.). But if, as we should, we allow statements to be indeterminate in truth-value and so reject bivalence, what becomes of the point Quine is making? In short, that sometimes there may be nothing that we can do, even in principle, to secure reference to one thing rather than another. To successfully refer requires not only that we engage in reference-fixing activities but also that there be eligible referents. But even once we have done everything that we can do, there may still be ties in eligibility, and if there is, there will be referential indeterminacy. And such referential indeterminacy will be properly classified as *ontic* rather than semantic, for it will be the world, and not us, that isn't playing its part.

That there is ontic referential indeterminacy of this kind is, we think, entirely plausible. Indeed, it is plausible that it is widespread. If there are no vague objects in the vicinity of the table, or the cloud, or the mountain, or indeed any macroscopic object, but just a host of overlapping precise ones, it is overwhelmingly plausible that we do not secure reference to any one of them rather than another using those general terms of our language that we use to construct singular referring terms. The defender of semantic indecision supposes that there are precisifications, that is, ways in which we could, in principle, revise our general terms in order to secure a determinate reference. But it is plausible that this is mere fantasy. We are not suggesting here that it is a fantasy to suppose we can always find a way to refer to any of the precise objects that stand in the vicinity of ordinary macroscopic objects. What we are suggesting is a fantasy is that we can always do so using terms that count as precisifications of our extant general terms. At any rate, if what we are suggesting is right in even a single possible case, then there will be the possibility of identity statements that are ontically indeterminate in the absence of vague objects in a way that is consistent with the soundness of Evans's argument. Suppose, for example, that we single out a precise mountain-like object in the vicinity of some mountain using the singular term 'M'. And suppose that 'mountain' is one of those general terms that cannot be precisified to secure a determinate reference. Now consider the identity statement 'the mountain on the horizon is identical with M'. This may be indeterminate in truth-value due to the referential indeterminacy of the term 'the mountain on the horizon'. But the referential indeterminacy will be ontic rather than being a matter of semantic indecision.

15.6 Ontic Indeterminacy in Boundaries Entails Vague Identity

So far we have argued that Evans's argument against vague identity can be defended. Our conclusion is that it establishes that if a statement of identity is indeterminate in truth-value, one of the terms flanking the sign of identity must be referentially indeterminate – an imprecise designator. We have acknowledged, however, that the

soundness of Evans's argument is consistent with the existence of vague objects and that it is even consistent with existence of identity statements that are indeterminate in virtue of the existence of vague objects. But are there vague objects and can Evans's argument be used to in fact demonstrate that they are impossible?

The question we are concerned with can be expressed as follows. Does ontic indeterminacy in boundaries entail ontic indeterminacy in identity? One understanding of this question can be expressed in this way. If a is an object with an indeterminate boundary, does it follow that there must be an indeterminate statement of identity '$a = b$', in which 'b' as well as 'a' is determinate in reference? For example, if Kilimanjaro (henceforth, K) has a vague boundary because a particle, Sparky (henceforth S), is neither indeterminately part of it nor determinately not a part of it, does it follow that there must be some indeterminate statement of identity '$K = c$', in which 'c' as well as 'K' is determinate in reference (see Weatherson 2003, p. 222)? The sense in which it is correct to say that Edgington and Tye and the view they represent are right is that if the question whether ontic indeterminacy in boundaries entails ontic indeterminacy in identity is understood in this way, its answer is negative.

It will be useful to look at an argument for an affirmative answer (given in Weatherson 2003) and how it must be answered, to see to what the defender of ontic indeterminacy in boundaries is committed if he endorses Evans's argument. Suppose it is indeterminate whether K contains S, 'K' and 'S' being precise designators and 'contains' determinately having as its extension the set of pairs $<x$, $y>$ such that y is part of x. Now let us dub the fusion of K and S 'K+' and the fusion of the parts of K not overlapping S, 'K−'. It is definitely the case that K is K+ if and only if S is part of K. And it is definitely the case that K is K− if and only if S is not part of K. But it is indefinite whether K has S as a part. So it is indeterminate whether K is K+ and it is indeterminate whether K is K−. Generalising, if a is any object with indeterminate boundaries, there must be an indeterminate statement of identity '$a = b$', in which 'b' as well as 'a' has a determinate reference ('b' standing to 'a' either as 'K+' stands to 'K' or as 'K−' stands to 'K').

The believer in ontic indeterminacy in boundaries who endorses Evans's reasoning can resist this argument in only one way. He must refuse to assent to the proposition that it is definitely the case that K is K+ if and only if S is part of K. Mutatis mutandis, he must refuse to assent to the proposition that it is determinately true that K is K− if and only if S is not part of K. He must say that in each case the left-hand side of the biconditional of which the proposition is a definitisation is indeterminate in truth-value (since it is an identity statement containing no imprecise terms). So since the right-hand side is indeterminate, the biconditional is not true and its definitisation is false. Hence, he must say that it is not definitely the case that objects with the same parts are identical.

He can say this without inconsistency and still endorse the inference from 'a and b share all their parts' to '$a = b$', just as a supervaluationist who equates truth with truth under all precisifications (supertruth) can endorse the inference from 'p' to 'it is (definitely) true that p' and not accept the conditional 'if p then it is (definitely) true that p'.

Hence, just as the supervaluationist identifier of truth with supertruth must say that 'p' and 'it is definitely true that p' differ in ingredient sense, though they are identical in assertoric content (Dummett 1991, p. 47), the defender of ontic indeterminacy in boundaries who does not wish to dispute Evans's reasoning must distinguish the ingredient senses of 'a and b have the same parts' and '$a = b$', but may maintain the identity of their assertoric contents.[11]

That this is the *only* way the proponent of this position can respond to Weatherson's argument from ontic indeterminacy in boundaries to ontic indeterminacy in identity has been disputed, in effect, by Barnes and Williams in their (2009) paper mentioned earlier, who argue that the believer in vague objects can accept that it is definitely true that things with the same parts are identical and so accept that it is definitely true that K is K+ (K−) if and only if S is (not) part of K, whilst denying that it can be inferred from these propositions and the indeterminacy of 'S is part of K' that there is vague identity in the world in the sense Evans denies. He can do so, they say, because he can reject the assumption that 'K+' and 'K−' are referentially determinate. In fact, they say, the believer in vague objects can say that these terms are another example of referential indeterminacy in the absence of semantic indecision. He can say that the situation with Kilimanjaro is the following. There are two distinct (and hence, consistently with Evans's reasoning, determinately distinct) objects, Kilimanjaro and dual-Kilimanjaro (henceforth K and dual-K). Of each of these, it holds that it is indeterminate whether S is part of it. For each x apart from S, it is determinate that x is part of K if and only if it is part of dual-K. But determinately, S is part of K just in case it is not part of dual-K. So K and dual-K are determinately distinct. Each of 'K+' and 'K−', understood as introduced above, is referentially indeterminate between K and dual-K. Hence, even though 'K is K+' and 'K is K−' are both indeterminate in truth-value, this does not mean that there is ontic indeterminacy in the sense intended to be ruled out by Evans's argument.

The problem with this proposal is straightforward. 'K+' and 'K−' relate to K and dual-K as 'the smartest child' relates to Mary and Jane (if these are the two competing candidates for the title). Just as 'the smartest child has brown hair' is determinately true if and only if each of the candidates has brown hair, 'K+ contains Sparky' is determinately true if and only if each of its candidate referents contains Sparky – and the same is true of 'K− contains Sparky'. So neither of these is determinately true, and neither is determinately false. However, both 'K+ is such that it indeterminately contains S' and 'K− is such that it indeterminately contains S' are true since each of the candidate referents is such that it indeterminately contains S. In fact, if 'K+' and 'K−' are referentially indeterminate terms whose contribution to the truth-conditions of predications of which they are the subject is fixed in the supervaluational manner indicated, they mean the same – misleading spelling aside. So if 'K is K+ if and only if S is part of K' is determinately true and 'K is K− if and only S is not part of K' is determinately true, each of 'K is K+'

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[11]This is assuming, of course, that such a defender does not wish to reject the classical mereological inference from identity of parts to identity.

and 'K is K−' is determinately false. (Another comparison may be helpful. K and dual-K may be compared to i (the positive square root of minus one) and $-i$. The proposal that 'K+' and 'K−' may be introduced as terms with distinct meanings each referentially indeterminate between K and dual-K is like the proposal that two referentially indeterminate terms may be introduced for each of which the two equally eligible candidate referents are i and $-i$.)

The conclusion must be that the believer in ontic indeterminacy in boundaries who does not wish to dispute Evans's argument must say that 'K is K+' is false and deny that it is definitely true that K is K+ if and only if K has S as a part. But this is an option he can take, and he can point to the precedent set by the supervaluationist identifier of truth and supertruth.

Nevertheless, we shall now argue, Evans's argument is not one a believer in vague objects can ultimately endorse, for there are additional kinds of vague object to be considered, as well as those, like Kilimanjaro, that can, prima facie, be pictured as having fuzzy boundaries, and the existence of vague objects of these kinds requires ontic indeterminacy in identity. But it is plausible that if any case of ontic indeterminacy in boundaries is possible – for example, the Kilimanjaro case – then some (other) case that involves ontic indeterminacy in identity is possible. Hence, the possibility of *any* vague objects is incompatible with the soundness of Evans's argument.

We have already seen two examples of vague objects whose vagueness is prima facie different from that of Kilimanjaro, namely, Table and Hawley's mouse. Here's another (gleaned from Lewis 1993, pp. 35–36) for good measure:

Example: Fred's House

Fred's house is a vague object of which a newly constructed garage is a questionable part. So the reference of 'the largest house in the street' may be indeterminate between it and, say, No. 27.

Fred's house, considered as a vague object, either contains a garage or does not. Its size is either 1,200 m^2 of floor space or 1,000 m^2 of floor space. It is not correctly pictured as, prima facie, Kilimanjaro, or still more obviously a cloud, as having a fuzzy boundary.[12] Of course, someone who wishes to deny the existence of vague objects can redescribe this case as one in which there are two objects – the home, as we may call it, and the mereological sum of the home and the garage – and say that 'Fred's house' is referentially indeterminate, no doubt as a result of semantic indecision. But someone who wishes to say that K is a vague object determinately designated by 'K' can also say the same, without any of evident absurdity, of Fred and 'Fred's house'.

An example of another type of vague object can be provided by again considering Shoemaker's structure mentioned earlier. There we supposed that the example was

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[12]Whether it is right so to picture mountains and clouds, of course, depends on whether they have minimal extended parts – a mountain-sized heap of footballs does not have a fuzzy boundary in the sense in use here.

one in which 'the building in which Jones is lecturing' is referentially indeterminate. But suppose now we reconstrue it as an example of a vague object. We said Jones is lecturing in Alpha Hall. Suppose also that Smith is lecturing in Beta Hall. It is definitely true that Jones is located in just one building – even those who think that Alpha Hall and Beta Hall are two buildings agree – so we can speak of '*the* building in which Jones is located'. Mutatis mutandis, we can speak of '*the* building in which Smith is located'. If we think of these descriptions as precise designators of vague objects, we again cannot picture these objects as having fuzzy boundaries. Rather, they must be thought of, like Fred's house or Hawley's mouse, as having either a minimum or maximum spatial extent, but as overlapping:

_____...................... THE BUILDING IN WHICH JONES IS LOCATED
.... _____ THE BUILDING IN WHICH SMITH IS LOCATED

The continuous line represents the determinate region of each vague object and the line of dots the indeterminate region.[13]

It is tempting to describe cases such as this in a way that is consistent with the non-existence of vague objects by regarding the relevant definite descriptions as referentially indeterminate, but there is no obvious reason why a believer in vague objects cannot regard the descriptions instead as precise designators of vague objects.

These cases, of course, have temporal analogues which it is much more tempting to describe as involving vague objects.

van Inwagen describes a case (mentioned earlier) in which a man, Alpha, goes into a fiendish Cabinet which disrupts those identity-relevant elements of his existence to just such an extent that Omega, the man who emerges, is neither definitely Alpha nor definitely not Alpha. It is tempting to think that the descriptions 'the man who entered' and 'the man who emerged' are neither indeterminate in reference nor empty. But if so Alpha and Omega have to be regarded as vague objects, and they must also be regarded as having vague temporal extents: it is indeterminate whether Alpha, the man who enters, exists later and indeterminate whether Omega, the man who emerges, existed earlier. Another example of the same form is Shoemaker's Brown/Brownson case (in which Brownson post-transplant has the brain and psychology of the pre-transplant Brown and the body of the pre-transplant brain donor Robinson) if we suppose (contrary to Shoemaker's own view) that the case is one of indeterminacy in temporal boundaries (because our criteria for personal identity give weight both to psychological continuity and bodily continuity or because, say, Brown's psychology is not perfectly replicated in Brownson).

Now in cases of this type, it can be argued that ontic indeterminacy in boundaries entails ontic indeterminacy in identity. Assume that Brown is alone in Room 100

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[13]Other examples of the same type are Edgington's landmass which is either two mountains divided by a valley or one twin-peaked mountain and van Inwagen's example of two places connected by a narrow and frequently inundated isthmus that is not definitely land or sea (Edgington 2000, p. 40; van Inwagen 1990, p. 243).

before the transplant and Browson is alone in Room 101 afterwards. Then (1) It is determinately the case that there is just one person in Room 100 before the transplant, (2) it is determinately the case that there is just one person in Room 101 after the transplant, (3) someone who is determinately in Room 100 before the transplant is such that it is indeterminate whether he is in Room 101 afterwards, and (4) someone who is determinately in Room 101 after the transplant is such that it is indeterminate whether he is in Room 100 before the transplant.

Now the person in Room 100 before the transplant is not determinately identical with the person in Room 101 after the transplant. Are they determinately *non*-identical? This is inconsistent with the description given of the case as one in which there is just one person in Room 100 before the transplant (for Brown is determinately there, and Brownson is indeterminately there, so if Brown and Brownson are determinately distinct, it cannot be that it is determinately true that there is *just one* person there). But it cannot be denied even by the vague object theorist that there is just one person in Room 100 before the transplant since even those who think that the man who receives the new body dies and Brownson is someone else (Robinson or someone new), so that the situation involves two determinately distinct people, agree that before the transplant just one man is in Room 100, and, of course, those who think of the transplant as merely providing Brown with a new body think there is just one person all along and hence just one person in Room 100 before the transplant. So the vague object theorist who thinks of the case as involving ontic indeterminacy in temporal boundaries must accept that the person in Room 100 before the transplant is indeterminately identical with the person in Room 101 after the transplant.

The same reasoning applies in the structurally analogous case of putative indeterminacy in spatial boundaries. Given that (1) it is determinately the case that there is just one building in which Jones is located, (2) it is determinately the case that there is just one building in which Smith is located, (3) some building in which Jones is determinately located is such that it is indeterminate whether Smith is located in it, and (4) some building in which Smith is determinately located is such that it is indeterminate whether Jones is located in it, it follows that the building in which Jones is located is indeterminately identical with the building in which Smith is located if each of the descriptions 'the building in which Jones is located' and 'the building in which Smith is located' is a referentially determinate designator of a vague object. For it cannot be denied that there is just one building in which Jones (mutatis mutandis, Smith) is located since even those who think that Alpha Hall and Beta Hall are two buildings agree with that.

Thus, some cases of ontic indeterminacy in boundaries do involve ontic indeterminacy in identity, even if others, like the Kilimanjaro case, do not.

But, as said previously, it is plausible that if there are (in logical space) any cases of ontic indeterminacy in boundaries at all there must be (in logical space) cases of the type just described. So in this sense it is true that the possibility of cases of ontic indeterminacy in boundaries entails the possibility of ontic indeterminacy in identity.

15.7   Vague Identity Entails Ontic Indeterminacy in Boundaries

However, as we shall now argue, even if the possibility of ontic indeterminacy in identity is acknowledged, it cannot by itself account for all vagueness in reality. Not only does ontic indeterminacy in boundaries entail ontic indeterminacy in identity, but also the converse holds.

The crucial point here is that whenever a singular statement of identity is indeterminate, there will also be a statement not involving the concept of identity which is indeterminate.[14] It is indeterminate whether van Inwagen's Alpha, the person who enters the fiendish Cabinet, is Omega, the person who emerges. So it is indeterminate whether someone both enters and emerges. It is indeterminate whether Brown is Brownson. So it is indeterminate whether someone is both in Room 100 pre-transplant and in Room 101 post-transplant. Other statements not involving identity will similarly be indeterminate in truth-value. Thus, if Brown is thin and Robinson, the body donor, is fat, it will be indeterminate whether someone is both thin at the earlier time and fat at the later time. The point, of course, holds generally, not just for persons. If it is indeterminate whether the new church is the old church, it will be indeterminate, say, whether some church which was made wholly of granite is now partly made of brick. And in Shoemaker's case of Alpha Hall and Beta Hall, it is indeterminate whether there is a building in which both Jones and Smith are located.

Of course, all these statements are logically equivalent to ones in which the concept of identity figures (so is any statement). But their indeterminacy cannot be explained just by reference to indeterminacy in identity – just as we cannot explain the (possibly multiply determined) indeterminacy in 'the smartest child is tall' just by reference to indeterminacy in identity. If a statement is indeterminate in truth-value, some expression occurring in *it* (or some grammatical feature of *it*) must be the location of the indeterminacy; it can be neither necessary nor sufficient that some expression not occurring in it is characterised by indeterminacy.

So consider again the case of Brown and Brownson. It is indeterminate whether Brown is Browson. So it is indeterminate whether the man in Room 100 before the transplant is the man in Room 101 afterwards. So it is indeterminate whether there is a man who is both in Room 100 before and in Room 101 afterwards.[15] To make sense of this reference to indeterminate identity is insufficient. We need, if we are thinking of the indeterminacy as ontic, to appeal to the notion of a vague object. Moreover, because of the temporal symmetry of the situation, comparable to the spatial symmetry in the Alpha Hall/Beta Hall case, *one* vague object cannot suffice. It is definitely true that some person exists at the earlier time and definitely true that some person exists at the later time. So to postulate a single vague object which is

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[14]If only because if '$a = b$' is true '$\exists x(Ax \& Bx)$' is true in which the predicates 'A' and 'B' relate to 'a' and 'b' as 'Socratizes' relates to 'Socrates'.

[15]Though it is definitely true that there is a man, just one, in Room 100 before and definitely true that there is a man – just one – in Room 101 afterwards.

indeterminately a person is inconsistent with the description of the situation as one in which it is definitely true that a *person* exists at the earlier time and definitely true that a *person* exists at the later time. And if there is a single vague object which is determinately a person but is such that it is indeterminate whether it exists at the earlier time and indeterminate whether it exists at the later time, it is false that the situation is one in which it is *definitely* true that a person exists at the earlier time and *definitely* true that a person exists at the later time. So to accept the case of Brown and Brownson as a case of ontic indeterminacy in identity, one must accept that there are at least two vague objects sometime present, one of which determinately exists at the earlier time and is such that it is indeterminate whether it exists at the later time and the other of which determinately exists at the later time and is such that it is indeterminate whether it exists at the earlier time. If the Brown/Brownson case is one of ontic indeterminacy in identity, therefore, it is also one of ontic indeterminacy in boundaries.

15.8   Evans's Conclusion by a Safer Route

But, of course, we can now argue that, contrary to the description given of the case as one in which it is definitely true that there is just one person present earlier and definitely true that there is just one person present later, these two vague objects are determinately distinct, since one of them has the property: *is such that it determinately exists at the earlier time (and is thin then)* and the other lacks this property. The reasoning here parallels that in Evans's argument but appeals only to the identity-free property: *is such that it determinately exists at the earlier time (and is thin then)*, the possibility of which was drawn attention to earlier in the discussion of Lowe.

It may be that there are vague objects which can only be distinguished by identity-involving properties. The reasoning just given cannot refute the possibility of their ontic indeterminacy in identity. For that we need Evans's argument. Setting these aside, we can conclude that any case of ontic indeterminacy in identity must involve ontic indeterminacy in boundaries and hence, by the reasoning just given, will after all be one in which the putatively ontically indeterminately identical objects are distinct after all. If, as is plausible, the possibility of cases of ontic indeterminacy in the identity of vague objects only distinguished by identity-involving properties entails the possibility of cases of ontic indeterminacy in the identity of vague objects which can be distinguished by identity-free properties, we can conclude that vague identity is impossible *simpliciter*.

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