6. SYMMETRICAL UNIVERSES AND THE IDENTITY OF INDISCERNIBLES

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ABSTRACT. The view that numerical difference entails qualitative difference has come under attack from various quarters. One classical attack, advanced by Black, involves possible worlds which are symmetrical. In a symmetrical world, it is claimed, the identity of indiscernibles is false. I argue that such attacks are mistaken, basically because they confuse epistemological issues (such as, how to specify a quality difference) with ontological ones (such as, whether there is such a quality difference). In brief, though there may be some reasons for doubting the necessity of the Identity of Indiscernibles, the possibility of a symmetrical world is not one of them.

I.

Is it possible for two individuals to share all properties in common? Such a question introduces the problem of whether or not the identity of indiscernibles (henceforth 'IdI') is necessary. Typically, arguments against the necessity of the identity of indiscernibles are governed by more or less explicit notions of what counts as a "property" and what sentences are held as "necessary." Then some possibility is described in which the IdI is claimed to be false. If it is false in one case, it is not true in all, hence, not necessary. An instance of this argument against the necessity of IdI involves possible universes which are symmetrical in character. Black, Strawson, and others have commented on such worlds. I shall take Black's presentation of and attack on the IdI as representative of, at least in part, what some of these other philosophers have claimed. If Black's claim about the universe he describes are correct, then he has shown that the IdI is not necessary. Recently, Castaneda has argued that the difficulties Black raises have not been fully explored. For individuals can be distinct without differing in a property, if Black's claims are right.

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Black describes his world in the following passage: "Isn't it logically possible that the universe should have contained nothing but two exactly similar spheres? We might suppose that each was made of chemically pure iron, had a diameter of one mile, that they have the same colour, and so on, and that nothing else existed. Then every quality and relational characteristic of one would also be a property of the other."\(^7\) Black takes this to be a counter example to the IdI. He chooses a symmetrical world because he wants a world in which spatial (and temporal) relations behave in the "ordinary" fashion; i.e., he wants to rule out as "possible" a world in which something is at a distance from itself, or a world in which two things can be in the same place at the same time. Many philosophers have believed that the system of spatial and temporal relations will distinguish any (material) object from any other. Black's claim is that this is not so in a symmetrical world.

There are two objects in Black's world. Represent this fact by the employment of two logically proper names, "a" and "b". Consider, then, the properties being-identical-to-a and being-a-distance-from-b. Both are properties exemplified by a but not by b. So either seems to entail the truth of the IdI in Black's world. For Black, however, neither is permissible. By formulating the IdI so that relational properties involving identity are excluded, Black disallows the first "property." This exclusion has several roots. To begin with, the notion of "identity" is sometimes held to be a logical and not a descriptive notion. Black may want to exclude properties which are not purely descriptive from a proper statement of the IdI. Further, a "property" such as being-identical-to-a is had by a alone. It cannot, by its very nature, be held in common with another object. Black believes that it renders the IdI trivial, and thus ought to be excluded.\(^8\)

The second property, being-a-distance-from-b, avoids these difficulties. That is, there could be two things exemplifying this property. Some philosophers, however, have argued that one should not employ such a property. Ayer, for example, claims we must exclude from the range of "f" in the statement of the IdI any predicate involving a name or definite description since the predicate "being-a-distance-from-b" surely could be true of more than one object.\(^9\) Black also refuses to allow the defender of the IdI to employ names, but for different reasons. Before attending to Black's reasons, let us examine the results. The property, being-a-distance-from-b is represented by a predicate with a name for an individual embedded in it. Without using names, such a property cannot be represented. All that can be concluded, however, is that if one does not (or cannot) use names in describing such a possible universe, then, if there is a property difference between the objects, that difference cannot be represented. One cannot conclude that there
is no property difference. So the proper conclusion is about language, not about the world the language describes.

Black's reason for the crucial refusal to let the defender of the IdI employ names is the following: "You talk as if naming an object . . . were the easiest thing in the world. But it isn't so easy. Suppose I tell you to name any spider in my garden: if you can catch one first or describe one uniquely you can name it easily enough. But you can't pick one out let alone 'name' it, just by thinking."10 Black claims here the naming of an object presupposes a unique description. To place this objection in perspective, return to the original question: Is it possible that there be two different objects such that all the properties of one are also properties of the other? The problem is about what there is, or at least what there could be. The problem is not about what one must know (a unique description perhaps?) in order to apply a name. To take the IdI to involve such questions is to introduce epistemological issues where they are irrelevant.11

The introduction of names has no bearing on the truth of the IdI within Black's universe. My use of "a" and "b" above may be taken merely to reflect what Black says, namely, that there are two things. If a and b are different, then the properties being-a-distance-from-a and being-a-distance-from-b are also different. In a way, that is all that is involved. Black would object, claiming that I am "just pretending to use names,"12 since he holds it impossible to name the spheres without some prior unique description. Black would claim that, in the above examples, I have not really used names. I may be attempting or proposing to use names; but the attempt is unsuccessful and the proposal is unfulfilled. He would urge that my use is vacuous, since I have failed to tie the labels to the spheres by some such christening as: "let 'a' stand for the object which is f," where the predicate 'f' is true of one and only one object.

Black takes the lack of definite descriptions to entail that the IdI is false. In this paper I propose that one arguing as Black does commits a crucial error: the conflation of the issue of whether it is possible to specify a property with the issue of whether the property exists. This error, stemming in part from an introduction of epistemological issues where irrelevant, leads Black to view conclusions about language as if they were about the world. The error also fuels two fallacious arguments. First, Black argues that since the objects of his example are not nameable it is impossible to specify a property difference. And since we can not specify some such property, the IdI is false. Second, Black argues that since all the monadic and relational properties the spheres have are the same, the IdI is false. In the next section I will discuss the issue of nameability; section III will deal with the claim that one
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need specify a property difference; section IV addresses the issue of relational properties; the last section touches on some broader issues connected to this discussion.

II.

In claiming that the IdI is false in a symmetrical universe, Black is demonstrably mistaken. To illustrate the mistake, view Black as asserting:

(a) To show the IdI true, it must be possible to specify some property had by one of the objects but not the other.

(b) If it is impossible to name the objects, it is impossible to specify any such property.

(c) It is impossible to name the objects.

What follows from (a) through (c) is that it is impossible to show the IdI true, not that the IdI is false. So the first point to make about this distilled version of Black's argument is that it does not establish that the IdI is false in any universe. At most, it establishes an epistemological point about our ability to exhibit the difference. Even further, it can be shown that (a) and (c) are both false, rendering the argument unsound. Further yet, the IdI can be shown to be as a matter of fact true in the world Black describes. To these points we now turn.

With respect to premise (c), is it really true that the spheres are unnameable? This is not one question, but at least several.

1. Does the world have a namer?

2. Could the world have a namer?

3. Would the presence of a namer (or namers) break the symmetry Black's example demands?

4. Supposing the world has a namer or namers, could we employ those names.

The answers to 1. and 2. are "no" and "yes" respectively. Black thinks (incorrectly) that the answer to 3. is "yes," and concludes from this (again incorrectly) that the answer to 4. is "no." Though I shall show that there is a sense in which Black's response to 4. is correct, an understanding of why this is so involves an appreciation of the property differences of the objects.

Black concedes the possibility that someone "enter" his world (whatever that would mean) and thereby name the
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But, in entertaining this possibility, Black commits two errors. First, he does not preserve the symmetry his example requires. He has his namer name one of the spheres "Castor" and the other "Pollux," thus breaking the symmetry crucial to his example. Second, he refuses to let the defender of the IdI employ a predicate like "being-a-mile-from-Pollux," since, he urges, the defender is in no position to use these names. This is his denial of 4. above. But why not use the names? Obviously Castor is the sphere which was not named "Pollux"--or, alternatively--which was named "Castor." This may have a ring of circularity, but that is easily dispelled. If, by saying, "Castor is the sphere which is named 'Castor'," I was attempting to establish reference, that is, christen a sphere, clearly I would fail. However, such is not the case here. Given the situation as Black describes it, such reference has been established by the namer. So, by saying, "Castor is the sphere which is named 'Castor'," I am stating a reference, not attempting to establish one. As a result, the spheres have unique descriptions since the universe is no longer symmetrical. Hence, in Black's (elaborated) example, the IdI is true.

However, we are not obliged to proceed as Black does. We may set the situation differently. Suppose Jones is "in" Black's universe, sitting on one of the spheres, labeling the sphere he is not sitting on with the sign "a". To preserve the symmetry of the situation, introduce Jones' twin on the other sphere, also labeling the sphere he is not sitting on with the sign "a". The situation looks hopeless, for just as both spheres have the same color, and cannot be distinguished in color terms--now it appears both spheres have the same name, with neither having a unique description. This reasoning, however, is mistaken. Since the two uses of "a" refer to different objects, they are in that crucial sense two names. We have similar signs, but different names. The uses of "a" are two in the significant sense that each refers to a different object; they are not two in the insignificant sense that both refer to one object (that would destroy the symmetry), nor in the sense that each refers to both objects (each namer names just the sphere that he is not sitting on). Then, since the names are different, the objects have unique descriptions for each twin. For us, standing "outside" Black's possible universe, as it were, an utterance of "a" lacks the context which would make it one or the other of the two uses to which it is put "in" Black's world. So Black may be right in claiming that we cannot name the spheres, but wrong if he concludes from this that they cannot be named. So, his claim that 4. is true is correct--but for the wrong reasons.

Happily, we may side-step the entire issue of labels and its epistemological flavor. For it turns out that premise (a) in the above argument is also false. Contrary to Black, one need not hold that to show that IdI true one must
be able to specify some property had by one object but not the other. For although such specification would be sufficient to show the IdI true, it is not necessary. The minimal requirement is merely to show that the objects differ in some property or other. Our ability to specify that property is simply beside the point. To know that \( a \) and \( b \) differ in some property we need not know the truth of a sentence which would be similar to one like "\( Pa \ . \ -Pb \)", where '\( P \) ' is some predicate constant. Knowledge of "(\( \exists f \) (fa . -fb))" is sufficient to know that \( a \) and \( b \) differ in some property. Of course the former is sufficient as well, since it entails the latter. We may view Black as not seeing this difference, thus requiring predicate constants (a sentence like "\( Pa \ . \ -Pb \)") which, in a symmetrical universe, would involve names. The failure to see the difference between these two requirements prevents Black from seeing that the IdI can be shown true in his world without using names. To this I now turn.

III.

To show that the spheres in Black's world differ in some property or other, I shall employ a reductio which involves describing Black's world without using names. To that description one conjoins Black's claim that the objects share all properties, and derives a contradiction. From this, one concludes that either Black's world is impossible or that the spheres do not share all properties. Granting Black the possibility of his world, it follows that the IdI is true within it.

Since there are at least two objects in Black's world, part of a proper description is:

1. \((\exists x) (\exists y) (x \neq y)\)  
The spheres are said to be a distance apart, or:

2. \((x) (y) (x \neq y \supset Dxy)\)  
Since the spatial relations are ordinary, no object can be a distance from itself, or:

3. \((x) \neg Dxx\)  
Black's claim is that the objects share all properties, or:

4. \((x) (y) (f) (fx \equiv fy)\)  
By a series of instantiations, one obtains:

5. \(x \neq y\)

6. \(x \neq y \supset Dxy\)

7. \(\neg Dxx\)
8. \((f) (fx \equiv fy)\)
The variable 'f' of 8. ranges over relational as well as non-relational properties. Thus one may instantiate 8. to obtain:

9. \(Dxx \equiv Dxy\)
From the above lines one obtains:

10. \((\exists x) (Dxx \cdot \neg Dxx)\)
That is, in Black's world there is at least one object both distant from itself and also not distant for itself. To preserve Black's example, one must hold 1.-3. true. From this and the contradiction in 10., it follows that 4. is false, or

11. \((\exists x) (\exists y) (\exists f) (fx \cdot \neg fy)\)
is true in Black's world. The objects differ in some property or other. This has been shown without specifying a property had by one but not the other.

The above deduction may seem suspect, especially the transition from 8. to 9. What is suspicious is that 9. seems to express something stronger than "symmetry", while one of the ground rules of this game is that the universe is supposed to be symmetrical. Crucial here is that the symmetry Black ascribes to his universe is a geometrical symmetry. He cannot conclude from that that the universe is symmetrical in the stronger sense that the object on one "side" shares all properties with the object on the other without question begging. And, in fact, 9. gives expression to this latter kind of symmetry. But this is not due to some error in moving from 8. to 9.; it is due to the falsity of 4. in Black's world.

In light of this, let us recast the argument, retaining 1.-3. but replacing 4. with

4'. \((x)(y)(R) (Rxx \equiv Rxy)\)

From 4'. and 1.-3. our contradiction follows. To avoid it, Black would have to deny 4'. in his world. However, I shall argue that 4'. is part of an appropriate transcription of the notion: sharing all relational properties.

Black might (correctly) urge that sentences like

(i) \((x)(y)(R) (Rxx \equiv Ryy)\)

and

(ii) \((x)(y)(R) (\exists y \equiv Ryx)\)
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are true in the universe he describes. He might further claim that 4'. is false in the universe he describes. Though this is also correct, it is so only if the IdI is true. That is, though (i) and (ii) capture part of what is involved in sharing all relational properties, do they capture the entire notion? Notice that this issue is not one of proof, but rather one of transcription. In considering what is an appropriate transcription, I am free to use devices which Black argues are not to be employed in speaking about his world, viz., names. The use of names enables us to focus on the meaning of: having all relational properties in common.

Suppose John loves Mary. Then John exemplifies the relational property loving-Mary. Suppose that, with respect to loving, John and Mary share all relational properties. Then Mary also exemplifies the relational property loving-Mary. So we know that if John loves Mary, then Mary loves Mary. Similar reasoning can produce the biconditional

\[ L_{jm} \equiv L_{mj} \]

and a parallel argument can be made for

\[ L_{mm} \equiv L_{mj} \]

Important to focus on here is the structure of the above biconditionals and their similarity to the structures of

\[ 4'. \quad (x)(y)(R) (R_{xx} \equiv R_{xy}) \]

In a word, 4'. is (part of) what is meant when one claims that IdI is false. But 4'. is also the sentence that (together with 1. - 3.) yields the contradiction. Notice that my use of names above is not question begging in that I am naming the spheres in Black's example. The employment of names is a device to focus on the proper transcription of the sentence: the objects share all relational properties in common. This notion, that the objects share all relational properties, will be explored from a slightly different angle in the next section.

IV.

At a critical point in the dialogue, Black has the defender of the IdI claim: "Let me try to make my point without using names. Each of the spheres will surely differ from the other in being at some distance from that other one, but at no distance from itself—that is to say, it will bear at least one relation to itself—being at no distance from, or being in the same place as—that it does not bear to the other. And this will serve to distinguish it from the other." To this Black replies: "Not at all. Each will have the relational characteristic being at a distance of
two miles, say, from the centre of a sphere one mile in diameter, etc. And each will have the relational characteristic (if you want to call it that) of being in the same place as itself. The two are alike in this respect as in all others. 14 Let us expand Black's argument a bit. We already know that

(a) The objects share all monadic properties.

What Black is claiming above is something like

(b) Relational properties which might be thought to distinguish the objects, such as the property expressed by "being at a distance from something", turn out--upon reflection--to be exemplified by both objects.

And this claim is correct. However, the conclusion Black draws from this is

(c) The objects share all relational properties.

Jointly, (a) and (c) entail the falsity of the IdI. I shall show here both that--contrary to Black--(b) does not entail (c) and that (c) is false, as a matter of fact. The pattern of argument I will employ should by now be familiar. By assuming that all relational properties are shared (assuming (c)), we will be led to a contradiction.

Consider two objects, a and b. Suppose each is a distance from something. That is

1. $(\exists x)(\exists y) (D_{ax} \cdot D_{by})$

Suppose, further, that the "something" that each is a distance from is one and the same thing. This we may express with

2. $(\exists x) (\exists y) (D_{ax} \cdot D_{by} \cdot x = y)$

or, more simply,

3. $(\exists x) (\exists y) (D_{ax} \cdot D_{bx})$

Reflection on this shows that we can express both: each of two objects is a distance from something, namely:

4. $(\exists x) (\exists y) (x \neq y \cdot (u) (u=x \lor u=y) \cdot (\exists z) (\exists w) (D_{xz} \cdot D_{yw}))$

and: each of the two objects is a distance from the same thing, namely:

5. $(\exists x) (\exists y) (x \neq y \cdot (u) (u=x \lor u=y) \cdot (\exists z) (D_{xz} \cdot D_{yw}))$
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Call the former expression of sameness a general relational property (each object is a distance from something), the latter expression a sameness of specific relational property (each object is a distance from the same thing). Important to note here is that we can express sameness of specific relational property without specifying that property—as we would in specifying, say, being-a-distance-from-Manhattan. This point will be crucial in our argument against Black. That is, we can state that two objects differ in some specific relational property without thereby being forced to specify that property.

We may view Black's point embodied in the quote beginning this section as stating that what is expressed in 4., viz., that there are two objects each of which is a distance from something, will not distinguish (by property) one object from the other. Put in terms of warding off a reductio we simply note that 4., even in conjunction with

6. (x) ¬Dxx

fails to entail a contradiction.

In reply, however, we must insist that if the objects share all relational properties, then they will share all specific relational properties (whether or not they are specifiable). In a word, if the IDI is false, and either of the objects is a distance from anything, then 5. must be true. Now 5. by itself does not entail a contradiction—though in conjunction with 6. it does.

Consider again (part of) 5. and 6.:

(∃z) (∃w) ((u) (u=z v u=w) . (∃x) (Dzx • Dwx))

(x) ¬Dxx

By elementary logic we arrive at

Dzu
Dwu
u=z v u=w
¬Dzz
¬Dww

Since these are jointly inconsistent we may conclude that

(∃x) (Dxx • ¬Dxx)
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This contradiction shows that even though the objects share all general relational properties, it does not follow from this that they share all specific relational properties. Put in terms of the "deduction" at the beginning of this section, we note that, contrary to Black, (b) does not entail (c).

V.

Sometimes Black speaks as if the IdI were a way of determining how many objects there are. But the IdI is not a way of counting. That is, the IdI is not the claim that if x and y differ in a property, they are two. Rather, the implication goes the other way: if x and y are two then they differ in a property. At a crucial point in his paper, Black claims that "in order to show the places the things occupied were different you would first have to show, in some other way, that the spheres were different."15 But that the objects are two is just not at issue. If they were only one in number Black has lost his alleged counter-example.

Black's refusal to allow names may be illuminated in the light of his doubt as to how many objects there are in his possible world. On the one hand, if Black is unclear as to the number of objects, he will balk at applying two names. On the other hand, since there are no ways to tie labels to the objects, perhaps it is thereby unclear how many objects there are. Thus two errors may support each other, connecting the issue of naming with the question of how many objects there are. The reductios in this paper have all depended on some assumption regarding how many objects there are. But if Black doubts that there are two objects, then of course he would not see the reductios. For there is no issue, no problem, no counter-example, and no reductio in a one-sphere universe.

From the perspective now obtained it should be clear what is correct and what is mistaken in Black's restriction on constants. Black is correct in observing that we cannot formulate a rule such as

Let 'a' stand for (\(\exists x) Fx\)

where 'F' is some unique predicate. However, a pair of constants can be taken to reflect that there are two objects. Taken in such a way the constants are not labels so much as shorthand for what we express with quantifiers and the identity sign. When Black asks, "What is named by 'a'?") he asks for a rule such as above. The response, "It doesn't matter," is a way of saying that no questions are begged by using constants as the above mentioned shorthand.

Thus Black's (possible) response, "Which property is it
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that one object has that the other hasn't?" has the effect of reintroducing the requirement that one must be able to specify the property difference. But the IdI is not the claim that objects differ in specifiable properties, it is rather the weaker claim that they differ in some property or other. Or, Black may be worried that the distinguishing property involves the identity relation. Some philosophers have maintained that the instantiation to the identity relation is sufficient to arrive at a contradiction. Though this is correct, it violates a basic "ground rule" of Black's, namely, including identity among the relations under consideration. We have not had to instantiate to the identity relation to show Black mistaken. Notice, however, if Black is to be consistent, he should argue as follows: Each of the objects is self-identical, and in that they are alike; or, each of the objects is different from the other, and in that they are alike. So Black should argue that no relation—even identity and difference—would distinguish the spheres.

The reductios of the last two sections may be sketched as follows: First, from

A. \((\exists x) (\exists y) (x \neq y \cdot R_{xy})\)

\((x) \neg R_{xx}\)

\((x) (y) (x \neq y \supset (R) (R_{xx} \neq R_{xy}))\)

a contradiction follows. Second, from

B. \((\exists x) (\exists y) ((u) (u=x v u=y) \cdot (\exists z) (R_{xz} \cdot R_{yz}))\)

\((x) \neg R_{xx}\)

a contradiction follows. We could note further that these reductios are not limited to two-membered possible worlds, or even to finite worlds. Consider an infinite series of notes patterned as follows:

.........abcabcabcabc...........

Let the predicate \(A\) mean being-an-a, while \(R\) means being-prior-to. The following are truths about the series:

1. \((\exists x) (\exists y) (x \neq y \cdot Ax \cdot Ay \cdot R_{xy})\)

2. \((x) (y) (R_{xy} \supset \neg R_{yx})\)

2. says prior-to is an asymmetrical relation. Though this feature (of asymmetry) is not part of Black's world, irreflexive relations are, and asymmetry entails irreflexivity. Note also that this series of notes is like Black's universe of spheres in that one cannot specify a (relational) property had by one of the A's that is not had by the others. Not
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surprisingly, if we assert that A's share all relational properties--this assertion, represented (in part) by

\[ 3. \ (x) \ (y) \ ((Ax \cdot Ay \cdot x \neq y) \supset (R) \ (Rxx \equiv Rxy))\]

is inconsistent with 1. and 2.

To all of the above a defender of Black has several routes of reply. One is simply to deny that there is some such relation R such that either:

(1) (x) \neg Rxx and
(2) (x) (y) (x \neq y \supset Rxy) or
(3) (x) Rxx and
(4) (x) (y) (x \neq y \supset \neg Rxy)

Such a denial--assuming there are two objects--is equivalent to

\[ 5. \ (x) \ (y) \ (R) \ (Rxy \equiv Rxx) \]

But (5) is part of what is involved in the claim that the objects share all relational properties, viz., that the IdI is false. The denial that some such relation exists is tempting--for it undercuts my refutations of Black's argument. But it undercuts them in a question-begging way. For now the defender of Black must include in the very description of the possible world that the objects do not differ in a relational property.

One motive for denying the existence of some such relation R might be the absence of any logical necessity to accept such a relation. But suppose there is no such relation. Then we either have a case in which our two spheres occupy the same place, or each sphere occupies more than one place, the same ones for each sphere. Now each of these "cases" is symmetrical, yet in neither of them is the IdI true for the kinds of reasons I have offered. The problem with such speculations is that they lose sight of the very point in speaking of symmetrical universes. If there is no such relation R (as above described), then the notion of what counts as a "possible" world has expanded. We are all aware that some of the old arguments against the IdI have been an appeal to the facts that there is no logical necessity behind relations of space and time. So one could argue that it was "possible" that he be sitting on two chairs, etc. The introduction of symmetrical universes by Black (and others) has been an attempt to avoid such "arguments" while still raising questions about the truth of the IdI.

As a final note, suppose that one of the spheres changed some non-relational property, say, color. The
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spheres could then be named, and a specific relational property one had that the other lacked specified. So a change in monadic properties would entail—given Black's fusion of the existence of a property with our ability to specify it—an appearance of specific relational properties. This is startling consequence of Black's position, perhaps a further reductio.17,18

FOOTNOTES

1. The identity of indiscernibles (hereafter abbreviated as the IdI) is expressed, in standard notation, by

\[(x) (y) (x \neq y \supset (\exists f) (fx \neq fy))\]

For the purposes of this paper, I will take the '=' sign as primitive or undefined. This leaves the truth of the IdI undetermined, thus avoiding begging questions.


6. Another route of attack against the IdI, independent of Black's, lies in the postulation of special individuators which are not themselves properties. Bare particulars are an example.


8. Black, "Identity . . .", 204-6. Notice that the demands that the IdI be both non-trivial and necessary seem to conflict, at least on some standard notions of "trivial" and "necessary."


11. Castaneda, "Individuation . . .", 134-5. In claiming that "There seems to be no way of telling one object from its twin," Castaneda preserves this epistemological cast the issue has been given by Black. Also Ayer, "Identity . . .", 222. Although not employing Black's epistemological reasons for not allowing names, Ayer still argues against their use. Strangely, he does not side with Black and conclude that the IdI is false. Rather he seems to claim that, as a matter of fact, we cannot imagine such symmetrical universes. "Imagination"
FOSTER may be his criterion for what counts as a "possible" universe; it surely has been a traditional one. In any event, his claim seems patently false as well as his criterion mistaken.


17. This is not entirely fair to Black's position. He could claim that if one of the objects ever changed then the universe was not symmetrical over time, hence not symmetrical.

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