ABSTRACT. The paper formulates and defends a version of the Identity of Indiscernibles and demonstrates that it entails a non-trivial version of the doctrine of essentialism.

The Identity of Indiscernibles (II) is a principle of many versions. What will be called 'actual-world II' is a version which confines its claims to the actual world. It may be formulated, in terms facilitating comparison with other versions, as follows.

**Actual-World II**

For any individuals x and y which exist in the actual world: if x (as it is in the actual world) is indiscernible from y (as it is in the actual world), then x is y.

What will be called 'intra-world II' claims for all possible worlds what actual-world II claims for the actual world.

**Intra-World II**

For any world w and any individuals x and y which exist in w: if x in w is indiscernible from y in w, then x is y.
More general yet is what results when the principle is made to apply across possible worlds.

**Cross-World II**

For any world \( w \), any individual \( x \) which exists in \( w \), any world \( w' \) possible relative to \( w \), and any individual \( y \) which exists in \( w' \): if \( x \) in \( w \) is indiscernible from \( y \) in \( w' \), then \( x \) is \( y \).

It is plain that actual world II is entailed by intra-world II and that the latter is entailed by cross-world II.

Due to the variety of possible construals of the term 'indiscernible', each of these versions itself comes in several versions.

Most of the recent discussion of II has dealt with versions of intra-world II. It has been asked, for instance, whether there is a possible world containing nothing but two qualitatively identical globes. As we will see in section V, Leibniz used and defended a cross-world version.

The present paper will focus on cross-world II. The objectives will be (a) to formulate and defend a very weak (but non-trivial) version of cross-world II and (b) to demonstrate that there is a connection, amounting actually to entailment, between (all non-trivial versions of) cross-world II and the doctrine of essentialism.

It is customary to distinguish "trivial," "weak," and "strong" versions of actual and intra-world II. In the present section, we will formulate a "very weak" version of cross-world II. This version will be defended in sections IV and V. The doctrine of essentialism will be derived from it in section III.

In order to provide a setting for the version of interest, let's formulate for cross-world II counterparts of the trivial, weak, and strong versions of actual and intra-world II. (Quantifiers will be provided for the more important "very weak" version.)

**Trivial CW II**

If \( x \) in \( w \) and \( y \) in \( w' \) are alike with respect to all properties, then \( x \) is \( y \).
ESSENTIALISM AND INDISCERNIBLES

Weak CW II

If x in w and y in w' are alike with respect to all suchnesses, then x is y.

Strong CW II

If x in w and y in w' are alike with respect to all non-relational suchnesses, then x is y.

Let's look first at the "trivial" version. If x and y are alike with respect to all properties, then assuming (as we will) that being x counts as a property, the identity of x and y follows trivially. For any individual x has, in any world in which it exists, the property of being x. Any individual y which, in any world, had that property, would, trivially, be, in that world, x. But given the principle of the necessity of identity, individuals which are identical in any world are identical in every world (in which either exists). (It is this principle, here to be assumed, which makes it unnecessary for formulations of CW II to specify in their consequents a world or worlds in which the identity would hold.)

In formulating the weak and strong versions, I have followed Robert Merrihew Adams in using the term 'suchness'. A "suchness" is any "purely qualitative" property (where 'qualitative' contrasts not with 'relational' but with 'referential'). That is, it is a property that "... could be expressed, in a language sufficiently rich, without the aid of such referential devices as proper names, proper adjectives and verbs (such as 'Leibnizian' and 'pegasizes'), indexical expressions, and referential uses of definite descriptions."[1]

So the properties of being red, being either four-legged or eight-legged, and being closer to a river than to a tree are suchnesses. Being Joan, being a child of that man, and being an American are not suchnesses (unless all properties are, as might be held by a proponent of the cluster theory of particulars).

In recent years it generally has been the weak version of (intra-world) II that has been at issue. Several writers have discussed the possibility of a world in which there is nothing but two indiscernible globes. The globes are supposed to be alike with respect to all suchnesses, relational as well as non-relational. The strong version, at least of actual-world II, was accepted by Leibniz. He argued that if there were two bodies, a and b, alike with respect to all non-relational suchnesses but differing in their relationships, God would have had no reason to assign to a, rather than to b, the relationships He in fact assigned to a. There would thus be a violation, Leibniz thought, of the
Principle of Sufficient Reason.

Let's move now to the version of II on which our discussion will focus. Although I believe it to be the weakest possible non-trivial version, I will call it simply 'very weak II'. Only the cross-world version will be given; its actual and intra-world counterparts will be obvious.

VW CW II

For any world w, any compositum x which exists in w, any world w' possible relative to w, and any compositum y which exists in w': if x in w and y in w' are alike with respect to all properties which refer neither to x nor to y, then x is y.

Before seeking to elicit the general import of this principle, I must ask the reader to bear with comments on four features of its formulation.

First, it will be noticed that the principle applies only to composita. By 'composita' we will mean individuals which are either (1) composed of two or more individuals or (2) composed of matter or some other kind of "stuff." (Of course, most material objects qualify under both clauses.) If quarks are incomposite (qualify under neither clause), then the principle does not apply to them.

Second, it is important that our principle does not apply to individuals in worlds which are mutually inaccessible (if there are such worlds). The advisability of this restriction, which does not unfit the principle for the use to which it is to be put, will be made clear in section IV.

Third, to exclude Alvin Plantinga's "world-indexed" properties, we will understand 'properties' to be short for 'non world-indexed properties'. Without such a provision, VW cross-world II would collapse into VW intra-world II.

Fourth, the clause 'which refers neither to x nor to y' has the purpose of saving the principle from triviality. As already noted, there are properties which are such that the identity of a and b would be a trivial consequence of their indiscernibility with respect to those properties. Examples: being b, not being a, being a and red, being that individual (where 'that individual' is used to refer to b). What these properties have in common is that they in some sense "involve" or "refer" to a or b. One might try to characterize them intentionally, say as properties which can be conceived only by reference to a or b. Instead, we will draw on Adams' linguistic criterion for suchnesshood (a suchness being a property which refers to no individual).

Property P refers to individual x if and only if P
ESSENTIALISM AND INDISCERNIBLES

cannot be expressed without the aid of a reference to x.

We will assume that on this definition, the trivializing properties cited above indeed do refer to a or b—and hence are excluded by the clause designed to exclude them.[2] As for the clarity of the definition, I believe (in view of note 2) that for our purposes it will be sufficient. The one point of clarification I want to provide concerns the expression 'without the aid of'.

Let 'X' be a proper name of the set containing just Socrates and Plato. When using 'X' (as in 'X has two members'), we refer to one thing, a set, not to three things. So when we express the property of being either Socrates or Plato by 'belonging to X', we refer neither to Socrates nor to Plato. Nevertheless, we can say that we express the property with the "aid" of such references, namely, the references that were involved in stipulating the referent of 'X'.

With these four preliminaries behind us, let's now try to get a clear picture of what is asserted by the very weak versions of II. We can do this by asking what would be needed for two (not necessarily different) composita, say two chairs, a and b, to be alike with respect to all properties which refer to neither.

In the first place, chairs a and b would have to be alike with respect to such qualities as size, shape, weight, color, and texture. That is, they would have to be qualitatively identical or, in Adams' language, alike with respect to all non-relational suchnesses. Of course, they would have to be alike also with respect to all relational suchnesses. A suchness refers to no individual; a fortiori, it refers neither to a nor to b. What's more, the chairs would have to have the same relationships to numerically the same individuals. If a is owned by Smith, the same would have to be true of b, since the property of being owned by Smith can be expressed without referring to a or b.

Furthermore, the chairs would have to be composed of numerically the same parts. It is possible to refer to any part of a chair without referring to the chair. We can identify the back of a as the back which was made by Jones on June 1. Alternatively, we can identify it by saying while pointing at it, 'this back'. We can then proceed to assign the back a name, say 'Bill'. If a and b are to be alike with respect to all properties which refer neither to a nor to b, then b, too, must have the property of having Bill as its back. The same applies to all of the other parts of a and b.

At this point, it may be suspected that the very weak versions, at least of actual-world and intra-world II, are
trivial. For isn't it trivially true that if chairs a and b are simultaneously composed of just the same parts, then a is b? The answer is "no," at least not in a sense (that of being a logical truth) in which it is trivial that if a and b share the property of being a, then a is b. In Max Black's dialogue, "The Identity of Indiscernibles"[3(R)], one of the characters seeks assurance that he has but one left hand, rather than three, four, or any other number, in the place where he always had assumed there to be just one. No doubt it is the possibility of hands made up of different (but place-sharing) molecules which Black's character has in mind. But suppose this more esoteric possibility should occur to him. "I have four left hands. All are made up of the same molecules. All are made up of the same one palm and the same five fingers. In fact, every proper part of one is numerically identical with the corresponding proper parts of the others." Notice that this description is not logically false. Nor is there any apparent way to convert it into a logical falsehood by replacing some of its terms with others equivalent in meaning. If we are to declare impossible the situation it describes, we must invoke a substantive metaphysical principle. A suitable one for the job would be very weak intra-world II.

Let's now focus specifically on the cross-world version. Suppose that a in w1 and b in w2 are (not necessarily different) chairs which are alike with respect to all properties which refer neither to a nor to b. Then, throughout their histories, a and b are qualitatively identical, they have qualitatively and numerically the same total environment, and they are composed of numerically the same parts, say pl-p20. In fact, the worlds w1 and w2 differ, if at all, solely with respect to the identity of the chair constituted by these twenty parts. Now if, indeed, a and b are different individuals, then, in the strictest sense, they differ solo numero. To put it in the most vivid terms: What is asserted by VW CW II is that no two worlds (such that one is possible relative to the other) differ solely with respect to the haecceity of one of their composita. It seems clear that very weak II actually is the weakest possible non-trivial version of the principle.[3]

Our task in this section is to formulate the doctrine of essentialism. In section III, we will derive essentialism from VW CW II. In sections IV and V, VW CW II will be defended.

Often, essentialism is understood to include two claims: (1) individuals have some of their properties essentially, and (2) individuals have some of their properties accidentally. So understood, Leibniz would not qualify as an "essentialist." We will be using the term less restric-
ESSENTIALISM AND INDISCERNIBLES

tively. We will understand essentialism to include only (a non-trivial version of) the first claim, and it is only this weaker version of the doctrine that will be derived from the Identity of Indiscernibles.

A second respect in which our formulation will be weaker than others commonly met with is this: We will identify essentialism with the claim that at least some individuals have essential properties,[4] not with the claim that all do. (What is entailed by VW CW II is that all composita have essential properties.)

Speaking roughly, we will identify essentialism with the contradictory of what Robert Stalnaker calls 'bare particular anti-essentialism'.

This theory holds, roughly, that for every individual and every property, there are possible worlds in which the individual has the property and possible worlds in which it does not. ([12(R)]: 344)

Roughly, then, we will identify essentialism with E1. (To say that a property P is essential to an individual x is to say that x has P in every possible world in which x exists.)

E1 There is an individual x and a property P such that P is essential to x.

A little less roughly:

E2 There is an individual x and a property P such that P is non-trivially essential to x.

Of course, E2 does not formulate what might be called 'sortal essentialism', the thesis that an individual's basic sort is essential to it. Nor does it assert the "essentiality of origins," the thesis that a compositum could not have begun its existence with parts entirely different (numerically) from those with which it actually did begin. These latter are specific essentialist theses. They make claims for particular sorts of properties. As befits the general doctrine, E2 claims only that individuals do have essential properties. It says that for at least one individual, there is some property, simple or complex, relational or non-relational, qualitative or referential, which is non-trivially essential to it. This is less than what one might like to establish, but the falsity of "bare particular anti-essentialism" is more than what has been established.[5]

Let's try now to refine the rough formulations with which we began. The first, E1, has the merit of being true. Its demerit is that it is but trivially true. There are several types of properties whose essentiality (to all or to
certain individuals) is all but uncontroversial and would hardly be taken to establish essentialism. Examples are the properties of being either spherical or not spherical, being Socrates, and not being Plato. All of these properties could be dismissed as but trivially essential to their possessors—in a sense of 'trivially essential' which could be explicated with the aid of the notion of logical truth. Hence E2.

Unfortunately, E2 does not do the job. Consider these properties, each of which is, or at least may be, essential to Socrates: (a) being unmarried if a bachelor, (b) not being both red and green all over, and (c) not being in the same place as any other individual of the same sort. No doubt the essentiality of (a) could be ruled trivial—in a broad sense of 'trivial' corresponding to a broad sense of 'logically true' (i.e., 'analytic'). Such a ruling may not be possible for (b) and almost certainly would not be possible for (c). Nevertheless, (b) and (c) are not the sorts of properties whose essentiality would be taken to establish essentialism. Speaking roughly, the essentiality of (b) is due to a necessary, if synthetic connection between two properties, being red all over and not being green all over, not to a special connection between a property and an individual. Both (b) and (c) are (or may be) what will be called universal properties, properties which are had by every individual in every possible world.

Well, then, how about this formulation?

\[ \text{E3 There is an individual } x \text{ and a non-universal property } P \text{ such that } P \text{ is non-trivially essential to } x. \]

(We need to retain 'non-trivially' because of non-universal properties such as being Socrates and not being Plato.)

E3 fails also. Consider the property of not existing at any time after a time at which Socrates ceases to exist. This property is non-universal, since we lack it. But if, as some philosophers believe, intermittent existence is impossible, then the property is essential to Socrates. It is not, however, trivially essential to him. The impossibility would be a matter of metaphysics, not of logic or definition. Since we don't want a formulation on which essentialism follows simply from the impossibility of intermittent existence, we must reject E3.

Not to burden the reader with a long series of unsuccessful formulations, I will move to one which I believe to be relatively satisfactory. It employs the notion, employed earlier in our formulation of very weak II, of a property's referring to an individual. But first I will give a transitional formulation, one whose failure will indicate the reason for dropping 'non-universal' in favor of a second indi-
ESSENTIALISM AND INDISCERNIBLES

E4 There is an individual x and a non-universal property P which does not refer to x such that P is essential to x.

E4 fails because of unworthy properties such as not being Plato. The latter is non-universal; it does not refer to Socrates; but it is essential to Socrates.

E5 There is an individual x, an individual y, and a property P which refers neither to x nor to y such that P is essential to x but not to y.

One important merit of E5 is that it does not employ the hard to define notion of non-trivial essentiality. Essentiality simpliciter can be defined easily and precisely within the possible worlds framework to which our discussion is, of course, committed.

Also relatively untroublesome is the notion of a property's referring to a given individual. For the reasons given in note 2, we can proceed on the assumption that (in the cases of interest to us) a given property refers to a given individual if and only if the property is "given" with the aid of such a reference.

It is easy to verify that E5 is not embarrassed by any of the unworthy properties mentioned earlier. Take, for instance, the property of not being Plato. This property is essential to Socrates, but it is essential also to every other individual to which it does not refer. [6]

I believe we now have a formulation which is strong enough to merit the label 'essentialist'. I also believe that it is too strong to formulate the minimum claim which would warrant that label. What I believe to be this minimum claim, and what I therefore will call 'essentialism', is the following.

E There is an individual x, an individual y, and a set S of properties which refer neither to x nor to y such that having at least one member of S is essential to x but not to y.

In order to get a fix on E, and on its relation to E5, let's for the moment neglect the features of these formulations whose purpose is to exclude unsuitable properties. Thus simplified, E5 says that at least some individuals have essential properties. Since to have a property is to lack the contradictory of that property, E5 says that for at least one individual there is a property which that individual had to lack. In other words, what E5 denies is that
just any individual could have had just any property. Similarly simplified, what E denies is that just any individual could have had just any set of properties.

It is obvious that E5 entails E. What may be less obvious is that E probably does not entail E5. To see this, let S be the set of suchnesses actually possessed by a but not by b; and suppose we could prove that having at least one member of S is essential to a but (obviously) not to b. This would establish E. But since having at least one member of S is a property which probably could not be expressed without the aid of references to a and b, it would not establish E5.

If, however, we did manage to prove for some set of suchnesses that a and b differ with respect to whether they could have lacked all members of that set, however the set might be identified, we would have refuted radical anti-essentialism. Since E seems to be the minimum claim that entails that for at least some individuals there are non-trivial limits to what might have been true of them, it is reasonable to take it as a formulation of "essentialism." In any case, not to argue about a name, E is a non-trivial essentialist thesis.

III

We will now derive E from very weak CW II. Stronger doctrines can be derived similarly from weak and strong CW II. In sections IV and V, very weak CW II will be defended.

Let's bring forward the two principles to which we will be referring. And let's now make explicit the qualification we have understood to apply to our formulations of essentialism. (See note 4.)

VW CW II

For every world w, every compositum x which exists in w, every world w' possible relative to w, and every compositum y which exists in w': if x in w and y in w' are alike with respect to all properties which refer neither to x nor to y, then x is y.

E

There is a possible world w in which there is an individual x, an individual y, and a set S of properties which refer neither to x nor to y such that having at least one member of S is essential in w[7] to x but not to y.

Here, then, is the derivation.
Let \( w \) be any world in which there are at least two composita. And let \( a \) and \( b \) stand for any two (numerically different) composita which exist in \( w \).

Let \( 'B' \) stand for the set of properties possessed in \( w \) by \( b \) which refer neither to \( a \) nor to \( b \).

Let \( '\overline{B}' \) stand for the set of contradictories of members of \( B \).

Since the contradictory of a property refers to nothing not referred to by the property itself, \( \overline{B} \) is a set of properties which refer neither to \( a \) nor to \( b \).

Suppose, for the sake of reductio, that having at least one member of \( B \) is not essential in \( w \) to \( a \). That is, suppose there is a world \( w' \), possible relative to \( w \), in which \( a \) exists but has no member of \( B \).

Then, in \( w' \), \( a \) has every member of \( B \). This is because to lack a certain property is to have the contradictory of that property.

But then: (1) \( w' \) is possible relative to \( w \), and (2) \( a \) in \( w' \) and \( b \) in \( w \) are alike with respect to all properties which refer neither to \( a \) nor to \( b \). So, by \( \forall w \, \forall w' \, \forall a \, a \equiv b \). (Note that the intra-world version would be insufficient.)

Since this contradicts our initial stipulation that \( a \) is not \( b \), we must conclude that having at least one member of \( B \) is essential in \( w \) to \( a \).

Having at least one member of \( B \) is not essential in \( w \) to \( b \), since, in \( w \), \( b \) has no member of \( \overline{B} \).

So, there is a set \( S \) of properties which refer neither to \( a \) nor to \( b \) such that having at least one member of \( S \) is essential in \( w \) to \( a \) but not to \( b \).

By existential generalization with respect to \( a \), \( b \), and \( w \), we arrive at \( E \).

We have succeeded in deriving \( E \); but before closing this section, I want to take notice of another interesting principle, one which also has, in effect, been derived. What this principle states, omitting the clause needed to save it from triviality, is that none of the composita of our world could have had all of the properties actually possessed by any of the others (even if the others had not had
them). (There is a very slightly strengthened version of VW CW II which entails that no compositum could have had all of the properties possibly possessed by any other.[8]) In section II, it was noted that essentialism is here being identified with the contradictory of what Stalnaker calls 'bare particular anti-essentialism'. Interestingly, Stalnaker remarks,

. . . there is something implausible about the assumption that any of them [individuals] might have had the properties of any other. But it is not easy to see why this is implausible. ([12(R)]: 349)

It seems fair to say that we have identified a source of the implausibility. Let's conclude this section by putting the derivation into the simplest possible terms. (We'll omit the clause needed to exclude trivializing properties.)

Let a and b be any numerically different composita which exist in the actual world. VW CW II tells us that there is no possible world in which a has all of the properties possessed in the actual world by b. (If there were, a would be b.) This is to say that there is an exemplifiable set of properties that a could not have had. Put thus, it is plain to see that cross-world II entails essentialism.

IV

In section V, we will see that the principal arguments for II apply, with whatever force they have, to its cross-world versions. In the present section, we will see that the usual arguments against II simply do not apply to its very weak versions. More importantly, we will dispose of the one objection to VW CW II that may occur to readers closely familiar with recent work on identity.

The standard objections to II are directed against the strong and weak versions of the principle. Why, it may be asked, could not the universe have consisted of nothing but two spatially separated, qualitatively identical globes? Unless there is something impossible about such a universe, the strong and weak versions of intra and cross-world II are false. Obviously, however, there is no threat here to the very weak versions. Since the parts of one globe would differ numerically from the parts of the other, all versions of VW II are entirely consistent with the possibility of such a universe.

The same point would apply to examples involving temporally separated, qualitatively identical events. The sub-events comprising one would differ numerically from the sub-events comprising another.

234
ESSENTIALISM AND INDISCERNIBLES

If the events involved incomposita, again there would be no threat: VW II has been formulated to apply only to composita.

I know of only one argument that has even the appearance of challenging VW CW II. It is an argument based on a puzzle first discussed in print by Hugh Chandler [4(R)], who gives credit for its discovery to Stalnaker. The puzzle arises if we make the plausible assumptions that (1) at least some types of material objects are such that they could have begun their existence with some small parts numerically different from those with which they did in fact begin, but (2) no material object could have begun its existence with all different parts.

Suppose, to use Chandler's example, that an "alpha" is a type of object that is made up of three (qualitatively identical) parts. And suppose that any alpha could have originated with one different part, but not with two different parts. More particularly, suppose that these two principles hold.

P1 For any world w, any alpha x, and any (qualitatively identical) alpha parts p, q, r, s: if in w, x originates from p, q, r, then there is a world w' possible relative to w in which x originates from q, r, s, but which is otherwise just like w.

P2 For any world w, any alpha x, and any alpha parts p, q, r: if in w, x originates from p, q, r, then there is no world possible relative to w in which x originates from none, or just one, of p, q, r.

(Of course, P1 and P2 are not logically implied by the assumptions of the preceding paragraph. But the same puzzle can be generated directly from those assumptions that will be generated, less laboriously, from P1 and P2.)

As for the final clause of P1, it, or something very much like it, must be included if P1 is to do its job in generating the puzzle. We will understand P1 to entail that parts p and s are qualitatively identical, that p does not exist in w', that s does not exist in w, that s has in w' the role had in w by p, and that the only differences between w and w' are those relating to the identities of p, s, and their constituent parts. This means that P1 could be accepted only by those who reject weak CW II, but we will make no objection to it on that count. We will be able to meet the challenge to VW CW II without taking issue with P1.

Let's now make the following suppositions. (It will help to refer to the figure below.) In the actual world,
MICHAEL B. BURKE

wl, an alpha, a, is made from alpha parts A, B, C. In another world, w2, possible relative to w1, and otherwise just like w1, parts C, D, E are used instead. Given P2, we must say that the resulting alpha, b, is not a. In a third world, w3, which is otherwise just like w1, alpha a originates from B, C, D. That such a world is possible relative to w1 is guaranteed by P1. In a fourth world, w4, which is otherwise just like w2, alpha b originates from B, C, D. That such a world is possible relative to w2 is guaranteed by P1. From our suppositions it follows that w3 and w4 are just alike except with respect to the identity of the alpha made from B, C, D.

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It may appear that we now have a result which conflicts with our principle, VW CW II. Actually, we do not. VW CW II has been formulated so as not to apply in the case of worlds which are mutually inaccessible. The case of w3 and w4 would be counter-exemplary only if at least one of these worlds were possible relative to the other. To obtain this further result, two additional principles would be needed.

P3 Relative possibility is transitive.

P4 Relative possibility is symmetrical.

P3 is a principle which holds for modal systems S4 and S5. P4 holds for S5, but not for S4. With their aid we will deduce that w3 and w4 are possible relative to one another.

Given our earlier suppositions, w4 is possible relative to w2, and w2 is possible relative to w1. By P3, it follows that w4 is possible relative to w1. Therefore, by P4, w1 is possible relative to w4. Since w3 is possible relative to w1, it follows, by P3, that w3 is possible relative to w4. So, again by P4, w4 is possible relative to w3.

In sum, when all four principles are put together, we get a result which is inconsistent with VW CW II: Worlds w3 and w4 are possible relative to one another, and they differ solely with respect to the haecceity of one of their composita.

Do we, then, have a serious challenge to VW CW II? It must be acknowledged that each of P1–P4 is a principle of
considerable plausibility. But then so is VW CW II. All that has been demonstrated, of course, is that we must give up at least one of these five principles. The object of Chandler's paper was precisely to urge that what is possible (in the "broadly logical" sense) varies from world to world. He is prepared to reject P3. I am inclined to agree that this is the best course. We could embrace the Brouwer system, on which relative possibility is reflexive and symmetrical, but not transitive. Also in favor of this solution is Nathan Salmon, who includes a very helpful discussion of the case, which he calls 'The Four Worlds Paradox', in his recent book, *Reference and Essence* ([11(R)]: 238-40) Alternatively, one might prefer to reject P1. Roderick Chisholm is one of several who have held that in the "strict and philosophical" sense, every part of an object, no matter how small, is essential to its identity[6(R)]. A further option is to reject P2. This will appeal to anti-essentialists.

Happily, there is a simple way to remove all pressure for the rejection of our principle, VW CW II. It is provided by another of the cases discussed by Chandler, one which shows that any set containing P1, P2, and P3 is inconsistent. This other case features a bicycle, but it will be easier for us to stay with Chandler's "alphas."

Suppose that in the actual world, w1, an alpha, a, originates from alpha parts A, B, C. (See figure below.) Given P1, it follows that there is a world, w2, possible relative to w1, in which a originates from parts, B, C, D. But then, using P1 twice more, there is a world, w3, possible relative to w2, in which a originates from parts, C, D, E, and there is a world, w4, possible relative to w3, in which a originates from D, E, F. When P3 is added, it follows that w4 is possible relative to w1. This is contrary to P2.

Chandler takes this case to indicate that the relative possibility relation is not transitive. According to Chandler, it is open to us to say that w3 is possible relative to w2. w2 is possible relative to w1, but w3 is not possible.
relative to \( w_1 \). Given that \( w_1 \) is the actual world, \( w_2 \) is a possible world and \( w_3 \) is not. The latter is merely a possibly possible world. If \( w_2 \) had been actual, then \( w_3 \) would have been possible.

As already indicated, I am inclined to agree with Chandler's solution. Others may instead find in these cases confirmation of their mereological essentialism. But all that matters for our present purposes is that this second case shows that we must reject at least one of \( P_1, P_2, \) and \( P_3 \). This relieves all of the pressure on VW CW II arising from the first of Chandler's puzzle cases, which established the inconsistency of the set containing \( P_1, P_2, P_3, P_4, \) and VW CW II. Since I neither know nor can conceive of any other threat to VW CW II, I believe this clears the way for us to accept the principle, at least until someone shows why we shouldn't, on the strength of its great intuitive appeal.

In this final section, we will see that the principal historical arguments for intra-world II apply, with whatever force they have, to cross-world II. I will not develop these arguments, because I don't wish to rely on them. VW CW II is much closer to being indubitable than any of the doctrines on which strong and weak IW II have been based. Nevertheless, it will be worth noting that by strengthening II to make it apply across possible worlds, we have not deprived it of its traditional sources of support. Two such sources will be considered: the bundle theory of particulars and the Principle of Sufficient Reason.

The connection between II and the bundle theory is explained succinctly by D.M. Armstrong.

If it is true that a particular is a bundle of properties, and if properties are universals, then these truths are necessarily true. If so, then, necessarily, if particulars \( a \) and \( b \) have exactly the same properties, then \( a \) and \( b \) are the very same particular. That is to say, the Identity of Indiscernibles is necessarily true.\(^{(1)}\)

Without wishing to endorse the bundle theory, or even Armstrong's derivation from it of intra-world II, I want to observe that it would do no apparent damage to the derivation to replace 'if particulars \( a \) and \( b \) have exactly the same properties' by 'if particular \( a \) in world \( w_1 \) and particular \( b \) in world \( w_2 \) have exactly the same properties.' The reason Armstrong's derivation at least appears to succeed is that it appears to depend on nothing more than the transitivity and symmetry of identity. Suppose that particular \( a \) has a certain set of properties. Then, on the bundle theory, \( a \) simply is the "bundle," \( B \), of those properties.
ESSENTIALISM AND INDISCERNIBLES

If \( b \) has just the same properties, then, on the bundle theory, \( b \), too, simply is \( B \). (Obviously, the derivation can succeed only on a version of the theory on which for any set of properties, there can be no more than one "bundle" of that set of properties.) But if \( a = B \) and \( b = B \), then \( a = b \).

Assuming (as we are) the necessity of identity, the same result can be obtained if \( a \) is identified as an individual in \( w_1 \) and \( b \) as an individual in \( w_2 \). Suppose that in \( w_1 \), \( a \) is \( B \). Then in \( w_2 \) also, \( a \) is \( B \) (at least if \( a/B \) exists in \( w_2 \)). So if in \( w_2 \), \( b \) is \( B \), it follows that in \( w_2 \) (and hence in all worlds in which \( a/b \) exists), \( a \) is \( b \).

In the writings of Leibniz, the Identity of Indiscernibles is derived from the Principle of Sufficient Reason (PSR). On some occasions it is the actual-world version, or at most the intra-world version, which is derived.

It is indifferent whether three bodies which are equal and alike in every respect be placed in any order whatsoever, and consequently they never would be placed in order by Him who does nothing without wisdom. But also, being the Author of things, He will not produce any such; and consequently there are none in nature. ([9(R)]: 204)

On other occasions Leibniz appeals, in effect, to cross-world II. As usual, the justification is PSR.

... if space were an absolute being, there would happen something for which it would be impossible that there should be a sufficient reason, and this is contrary to our axiom... If we suppose that space is something in itself, other than the order of bodies among themselves, it is impossible that there should be a reason why God, preserving the same positions for bodies among themselves, should have arranged bodies in space thus and not otherwise, and why everything was not put the other way round (for instance) by changing east and west. But if space is nothing other than this order or relation... these two conditions, the one as things are, the other supposed the other way round [my italics], would not differ one from another: their difference exists only in our chimerical supposition of the reality of space in itself. But in truth the one would be just the same as the other, as they are absolutely indiscernible [my italics]; and consequently there is no occasion to search after a reason for the preference of the one to the other. ([9(R)]: 199-200)

Note that "the one" and "the other" are situations obtaining in (supposedly) different possible worlds, not two supposedly different situations obtaining in a single possible
MICHAEL B. BURKE

world. For a full discussion of this point, the reader is referred to a recent paper by Fred Chernoff [5(R)]. Although Chernoff distinguishes only "logical" and "non-logical" versions of II, he does show, in effect, and very carefully, that Leibniz's argument depends on what we are calling 'cross-world II'. What is also of interest to us is that PSR appears to provide for cross-world II the same support it provides for actual and intra-world II.

To see the connection between PSR and our principle, VW CW II, let's imagine that we are confronted by someone who denies that VW CW II is true. Recalling the first of Chandler's puzzle cases, let's suppose this time that the actual world is w3. And let's suppose that our imagined adversary believes that there indeed is a world, w4, possible relative to w3, which differs from w3 solely with respect to the haecceity of the alpha made from parts B, C, D.

That there is such a world is entailed by the four plausible principles formulated in section IV, but we established that the inconsistency of VW CW II with those principles provides no reason whatsoever to doubt the truth of VW CW II: The four principles are inconsistent with one another. But suppose that despite the absence of any principled basis, our adversary holds that there is such a world. Is there anything we could say to persuade him/her to give up this position? We would begin, and could reasonably end, by saying that his/her position seems both (utterly) counter-intuitive and (utterly) unmotivated. If this had no effect, we might in our exasperation appeal to a principle, PSR, which enjoys substantially less intuitive certainty than the principle we would be trying to support. We might reason as follows. "In the actual world, w3, when we put together alpha parts B, C, D, we got alpha a. On your view, we could have instead have gotten alpha b, despite using the same alpha parts, and despite putting them together in precisely identical circumstances. If so, there was no reason why we got a rather than b. Your position is inconsistent with the Principle of Sufficient Reason."

Let's conclude by summarizing our results. We began by distinguishing actual-world, intra-world, and cross-world versions of the Identity of Indiscernibles. The cross-world version has received almost no notice, but it is the version which was employed by Leibniz in certain of his arguments against absolute space and time. We then formulated a very weak version of II, distinguishing it from the familiar weak and strong versions. Thenceforth it was very weak cross-world II which was the object of our interest. We derived

w3  w4
a   b
BCD  BCD

240
from it the doctrine of essentialism--after laboring to find a satisfactory formulation of that doctrine. It must be emphasized that our version of essentialism is not one on which individuals are asserted to have purely qualitative essential properties. It amounts simply to the denial of the radical anti-essentialist thesis that any individual could have had any set of properties, qualitative or non-qualitative, excluding only those which are trivially incompatible with its identity. In the final two sections, we saw that the principal motives for accepting intra-world II apply equally in the case of cross-world II; more importantly, we saw that the usual objections to strong and weak II do not apply to very weak II. Most importantly, we were able to dispose altogether of the one objection to VW CW II which might occur to readers closely familiar with the recent literature on identity. This left any denial of our principle not only counter-intuitive, but unmotivated.

In brief: We have formulated and defended a non-trivial version of the Identity of Indiscernibles, and we have shown that it entails a non-trivial version of the doctrine of essentialism.[9]

REFERENCES


9(R) Mary Marris, trans. Leibniz: Philosophical Writings (London:


FOOTNOTES

1. Adams, ([1(R]): 7). Adams provides also a more technical, "possibly more illuminating" definition.

2. We are assuming that on the definition provided, properties such as being Socrates do refer to Socrates. An advocate of the cluster theory of particulars may hold that there is some complex property which (1) could be expressed without referring to Socrates, and (2) is logically equivalent to the property of being Socrates. But logical equivalence generally is thought not to be a sufficient condition of property identity. Indeed, if the relation between being Socrates and the complex property were to be one of analysandum to analysans, then the relation could not be that of identity. (On this point, see [7(R)].) In any case, this is is not something we need to worry about. If, contrary to our assumption, the property of being Socrates does not (on our definition) refer to Socrates, that would not mean that VW CW II is but trivially true. VW CW II follows trivially from the proposition that the property of being a certain individual does not refer to that individual. But the latter amounts to a non-trivial version of the doctrine of individual essences, which has as a corollary a non-trivial version of essentialism. If, for example, it were shown that being Socrates could be expressed by 'originating from gametes Fred and Sally', or by any other expression involving no reference to Socrates, essentialism would have been established. So, the assumption we are making is the one which is unfavorable to the achievement of our objectives.

3. Nathan Salmon formulates a similar, though stronger principle, which he calls 'the "reductionist" principle' ([11(R]): Appendix I, 237-38).

4. To avoid making essentialism contingent on the existence of individuals, by 'some individuals' we must mean 'some individuals in some possible worlds'. (I am indebted here to an anonymous referee for this journal.) In the interests of readability, this qualification will not again be made explicit until the beginning of section III, when it will become useful to do so. But all formulations of essentialism in this section are to be understood as prefaced with 'There is a possible world in which'.
5. For the best available arguments for the stronger theses, see [13(R)] and [8(R)].

6. The one threat to the non-triviality of E5 is posed by the "world-indexed" properties of Alvin Plantinga [10(R)]. Consider the property of being snub-nosed-in-k. (We'll use 'k' as an abbreviation of 'Kronos', which Plantinga uses as a proper name for the actual world.) Being snub-nosed-in-k is the world-indexed property which a thing has in every world just in case it has in k the ordinary property of being snub-nosed. Now the property of being snub-nosed-in-k refers neither to Socrates nor to the Parthenon; and it is essential to the former but not to the latter. Still, it is a property whose essentiality to Socrates is, in some sense, trivial. It is not, of course, trivial that Socrates is snub-nosed. But it is trivial that if in k Socrates is snub-nosed, then in every world in which he exists he has the property of being snub-nosed-in-k.

In section I, the world-indexed properties had to be excluded in order to prevent the collapse of VW CW II into VW IW II. Here, to block their trivialization of E5, we again will understand 'properties' to be short for 'non world-indexed properties'.

7. For reasons that will become evident in section IV, I want to avoid assuming that an individual's essential properties are world-invariant. (Nor do I want to assume otherwise.) To say that property P is essential in world w to individual x is to say that x has P in every world possible relative to w in which x exists.

8. For the record, it is this. For every world w, every compos- situm x which exists in w, every world w' such that w' and w are both possible relative to some world w'' (even if not relative to one another), and every individual y which exists in w'': if x in w and y in w' are alike with respect to all properties which refer neither to x nor to y, then x is y.

9. I am most grateful to Prof. Arda Denkel and to an anonymous referee for this journal for helpful corrections and suggestions.