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The metaphysics of individuation

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lays down on coincidence for co-satisfiable sortals provide a bridge between the A- and B-arguments. While the A-argument makes much of coincidence and continuity, the B-argument underplays it in favour of the necessary conditions of change. The invocation of the falsity of R, combined with either of these (preferably B) arguments, provide the strongest case that can be unearthed on the transcendental front for the claim that individuation requires (substance) sortals. It now remains to be seen whether, in following Wiggins' use of 'individuation', one is not handed sortals with one's eyes closed.

Section 4
Identity is not a Property or Relation

In considering whether there is more to the notion of identity than identity at a time, one is also examining whether individuation is possible without sortals. This latter possibility would invalidate Wiggins' third descriptive premiss concerning individuation, viz., the claim that singlings out must reach 'backwards and forwards' to times other than that of the current individuation. Now, Wiggins also claims that that "... which individuates,...is in the first instance a thinker, and derivatively a substantive or predicate." (SS, p.5). But if this is so, one may legitimately ask whether the thinker, in individuating in a basic way, is bound to use sortals. This is not to claim that she need not use any predicates, but simply whether her predicates must always be ones implicitly circumscribing the bounded histories of things. It would seem that they need only be if one ascribes to her highly Aristotelian intuitions, intuitions which sit badly with equally strong Humean intuitions to the effect that identity is exhausted by reflexivity, and not by 'coincidence as a substance'.

The non-sortal sense of individuation I wish to isolate for consideration is neatly put by Wiggins himself: " By 'single out' I mean to isolate x in experience; ...to fix upon x in particular by drawing its spatial [temporal] boundaries..." (SS, p.5). I would bracket the notion of temporal boundaries until it has conclusively been shown that continuity or persistence is so basic as to be inamenable to constructive endeavours (cf. SS, p.3: "For there is persistence through change, and no inquiry of the kind here envisaged could take leave of a datum so fundamental...", my italics).

That Wiggins is not free to consider the bracketing of the temporal arises from the further conditions which he lays down: "... what is required in a given case [of individuation] derives from what it would be to single that particular thing out as whatever it is." (SS, p.6); "...his relational state towards s... sufficiently approximates to,... the singling out of s... as a thing of a kind f..." (SS, p.6); "When something is singled out, ...the subject takes the object for something that it is (say, a man). He apprehends it in at least one way correctly, in however many ways he misapprehends it." ('On Singling out an Object Determinately', p.169).

I do not want to question the claim, implicit in the above quotations, that insofar as a thinker wants to reidentify a man or a star as the same star/man again, she must use sortals. I can grant Wiggins that reidentification criteria are tied to sortals. But this does not mean that either identity per se or individuation is. The thesis that they are may be made less plausible by showing how an individuator can be justified in accepting false identity statements, and hence succeeds in individuating under the wrong sortal (only less plausible, for sortals still figure, albeit in a more rarified way).

Consider someone saying, of Venus, 'That's the same star I saw yesterday, I traced its path through the heavens'. (Although Venus is not visible throughout the night, I shall ignore this complication). Two separate questions should be distinguished in relation to this statement. Firstly, 'Could that (i.e. Venus) have been a star?', and secondly, 'Could that (i.e., Venus) have been identified as a star?'. As regards the first question, one would want to deny that Venus, in fact a planet, could have been a star. Being a star is sharing the right features, features which planets do not have. This denial need not prejudge the question of whether 'star-properties' are preformed or written in the stars. I can deny that planets are possible stars without appealing to an eternal edition of the universe.[12]

As regards the second question, the answer is 'yes', Venus was in fact so identified, twice over, by the Babylonians. But if this was a successful identification, it was one ascribing the wrong persistence and identity conditions to the object identified, one under an incorrect sortal. And this point is independent of the Babylonians' ignorance that 'Hesperus' (that star visible in the evening) and 'Phospherus' (that star visibile in the morning) applied to the same object.

Wiggins might reply that Venus was merely individuated under a more general sortal, 'heavenly body'. But the point is that if this is to count as a singling out in the weighty Wigginsian sense, an indeterminate object has been singled out. Surely not all heavenly bodies have the same persistence conditions, comets do not last as long as suns. It might be conceded that 'heavenly body' is not as general as 'entity' or 'substance' and the like. Heavenly bodies do certain specific things, or seem to. They move and glow overhead, something not all entities do. But 'heavenly body' is not an adequate answer to 'same what?', even if it is in one way a correct apprehension of the individuated object.

The upshot is therefore that the initial Babylonian individuation was a successful one, even in the presence of ignorance as to the persistence conditions of the object picked out. Persistence is indeed a datum here, but very few people observe the comings into existence and ceasings

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[12] Cf. Schwartz, 'I'm going to make you a star' in French, et.al., (1986).

to be of heavenly bodies. As far as the masses are concerned, these are eternal objects. The success of their individuations cannot, however, be contingent upon some theory supplying the appropriate sortal, even if there is a presumption in favour of such a discovery. And this success relates not only to temporally indexed individuations, but also to reidentification, as the first claim put into the mouth of the individuator makes clear. The reidentification criteria, in this case, are tied to the wrong sortal ('star') but nevertheless successful. Insofar as 'star' will determine the wrong sort of beginning in time for Venus, as well as the wrong principle of activity, the claim that individuation must proceed by means of a sortal which allows one to determine the creation and destruction of the entity concerned, is shown to be at most a sufficient condition. I can successfully identify Venus as a star, even if that gets its bounded history completely wrong.

My aim is to strengthen this claim further. Such a project involves a brief re-examination of the notion of identity as well as an attempt to 'construct continuity', pompous as that may sound. If successful, the latter part of the project will show that persistence or continuity need not be implicit in an individuation in the sense that a substance sortal must be used.

Now, the falsity of R has shown that 'is identical with' may be treated as a legitimate relational predicate in its own right. This is also conceded by Wiggins in his argument for D, there is no semantical indeterminacy involved. Whether identity as such is to be treated as a (reflexive) relation is another question. It may be conceded that there are genuine reflexive relations, expressed by such predicates as 'kicking oneself' or 'feeding oneself'. But this is not to say that, because of parity of form, 'identity with oneself/itself' is necessarily to be viewed as expressing a relation. One can only gain philosophically, by ridding oneself of the view that language corresponds in a one-one fashion to reality. There are not properties or relations corresponding to every predicate. Emeralds may satisfy 'green' by instantiating a different property than that in virtue of which grass satisfies it. Similarly for descriptions such as 'either male or female'. This is indeed a description I satisfy, but only the foolhardy would claim that it expresses a property I possess. The view I wish to accept in this area is nicely summarized in Pendlebury ('Facts as Truthmakers', (1986), p.177), who expresses the point in the idiom of facts: "Thus the naive fact ontologist is committed to a thoroughgoing isomorphism between the structure of the world and the structure of our thought and talk about it [by viewing the 'making true' relation as 1-1]. But for those of us who do not regard facts as artefacts of thought and language, this is surely, on reflection, incredible. I find it more plausible to assume that a relatively simple thought or sentence may be made true by a relatively complex set of facts, and vice versa. The set of facts that makes it true that Smith is a bachelor is clearly far more complex than the thought that he is".

This takes care of those predicates satisfiable in virtue of different properties or in virtue of a

complex, conjunctive set of properties. Identity, on the view here propounded, falls into neither of these classes. It is to be assimilated to 'existence', following the line of thought initiated by Kant when he said that existence is not a predicate (by which he meant that it does not express a property). When one specifies an individual, thereby placing it in the world, one does not say, in addition, that it exists. Its existence and (self-) identity simply follow once it is in the world. It might be objected, on Kripkean grounds, that such a view cannot account for aposteriori identities which hold necessarily, i.e., that, in order to explain the aposteriori discovery that 'Hesperus = Phosphorus', one is committed to relational properties which hold necessarily (specifically, the relation between a and b in a = b). But I can agree with Kripke that some aposteriori identities are necessary (the true ones). The phenomenon is to be explained by the simple fact that, once an individual is part of the passing show, its self-identity is there also. This may then be combined with the view that identity statements, for example those under proper names, are necessarily true only by accident, not by virtue of intrinsic properties or natures of what the terms of the statements refer to. Once I have specified x as 'the man who denounced Cataline', and proceed to call it 'Cicero', the identity statement, necessarily true, 'Cicero = Cicero', follows automatically. If the x so specified is also called 'Tully', then 'Cicero = Tully' is also necessarily true, simply because 'Tully = Tully' is, and the two terms are co-referential. But it is contingent that x should be baptized twice, so the statement 'Cicero = Tully' can both express the contingency of that linguistic practice and the necessity of self-identity without the aid of necessary relational properties. It is clear, from the above, that self-identity behaves like trivial predicates such as 'F or not-F'. Once an individual has been specified, it will satisfy this predicate; in fact, all individuals do. But not in virtue of a disjunctive property. Similarly, all specified objects satisfy 'is identical to itself', but not in virtue of a relation it bears to itself.

The above view may be reinforced by conditionally accepting a certain view of properties and relations in terms of which properties are individuated by their causal efficacy (cf. Shoemaker (1979) and Armstrong (1978)). It is then far from clear that the dyadic predicate 'is identical with' contributes to the causal powers of the object which satisfies it. How does the property, if it is one, of being self-identical make a difference to what x can do or undergo which is not there independently? The friend of identity may object, at this stage, that she is not concerned with the universal, logical property of self-identity, but with whatever corresponds to attributions of specific identities, e.g., 'is identical with a', 'is identical with b'. But this is no more than convenient short-hand for whichever conjunctive set of properties a or b satisfies at or over time. The only other interpretation is to postulate a haecceity of a to correspond to 'is identical with a'.[13]

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[13] Cf. Kaplan, 'Transworld Heirlines' in Loux (1979), pp.88-109.

However, if such a haecceity is not a conjunctive set of properties, I do not know what it is. It may solve transworld individuation problems, but it is causally idle. In any case, the postulation of haecceities is equivalent to viewing the world as permeated with primitive thisness, it need not follow from taking identity as primitive in the Humean sense. Occam's Razor is important in this context, and may be invoked to reinforce the intuition that identity is not a relation. It is more prudent to get along with less rather than more (properties and relations). In the present case, the use of 'is identical with itself' is not to be viewed as the isolation of another genuine relation, over and above those that are needed to make sense of the world causally.

"We cannot, in any propriety of speech, say, that an object is the same with itself, unless we mean, that the object existent at one time is the same with itself existent at another." (Treatise, Bk I, Part IV, Sect.2). This is how Hume expresses the view that identity is not relational or categorically different from existence. He also implies that identity is predicated of momentary things only, and hence that it is paradoxical to ascribe it transtemporally unless such use is accompanied by the 'invention' of time-consuming entities: "...a succession of related objects places the mind in this disposition [where continuity in a presented object is seen as a change in time only, not in objects], and is consider'd with the same smooth and uninterrupted progress of the imagination, as attends the view of the same invariable object." (ibid., p.204). But this is what one in fact does, ascribe identity to different objects, objects related by non-identity relations. When the strict Humean view of identity is so baldly stated, it seems to debunk current conceptions in such a radical fashion as to be totally unacceptable. But this is not an inevitable dilemma for the Humean, as I shall try to show later.

The position arrived at may be put as follows: for ever x and y, if x = y, then the fact that x = y obtains solely by virtue of x's existence, and not by virtue of any other facts. Whatever x may be, the trivial fact that x = x is grounded only in the fact that x exists. Perhaps this could be rephrased as saying, de re of x, that it has the complex property being such that the fact that x is identical with it is grounded only in the fact of x's existence.[14] But by Leibniz's Law,

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[14] For my purposes, a purely syntactical de re/de dicto distinction will suffice. De re modal predications attribute essential properties to the res or thing in question, de dicto ones attribute necessary truth to the dictum or proposition in question. A formula containing a modal operator with within its scope either an individual constant, a free variable or a variable bound by a quantifier outside the scope of the modal operator, is to be seen as de re. Using 'P' for possibility and 'N' for necessity, the following formulas are therefore all de re : P(Fa), N(Fx) and $(x)\overline{N(Fx)}$. All other formulas containing modal operators are de dicto, e.g., P(Ex)(Fx) or $P(x)(\overline{Fx} \rightarrow N(x)(\overline{Gx})$. Throughout I use 'N' for non-epistemic necessity. I am not concerned with the modalities attaching to what is consistent with everything known at a time. A semantical version of the above distinction concerns the transworld identity conditions of objects, given a standard possible worlds semantics for modal logic. By translating formulas which are either de re or de dicto, according to the syntactical criterion, into possible worlds discourse, it can be seen that it is the de re which requires the availability of transworld identity criteria. Translation of the de dicto N(X)(Fx) yields $(w)(x)(\overline{E(x,w)} \rightarrow Fxw)$. Translation of the de re (x)N(Fx) requires a connection between existents in the actual world and the possible world under consideration. Using 'w*' to represent the actual world, the above de re formula is translated as $(x)(E(x,w^*) \rightarrow (w)(Fxw))$. I am not interested in the various problems associated with the availability of such transworld identity conditions. As a general objection to modal talk, it seems to me to take the semantics of modal logic too seriously. Although this is not the place to discuss modal logic as such, something should be said about Quinean reductions of all modal talk to the de dicto. A champion of de

for every y such that x = y, y will have this property. Then the fact that x = y will be grounded in nothing but x's existence; it just is the fact that x = x.

This way of putting the matter rests squarely on the determinacy of identity. That identity is indeed determinate may be shown in three short steps, if any proof is required. Suppose it is indeterminate whether x and y are identical. Then they already differ in that x is determinately identical with x, whereas y is not. That is, y does not have x's property being such that the 'is' of identity is determinately true of it. But then it is not indeterminate whether x = y, they are determinately distinct. This proof has obvious affinities to the necessity of identity, stated as: for every x and y, if x = y, then it is necessary that x = y. The exact hidden premiss used in the proof, however, is derived from the contrapositive of the necessity of identity. Alonzo Church calls it 'Murphy's Law of Modality': for every x and y, if it is possible that x ≠ y, then x ≠ y.[15] The possibility of x and y's non-identity would now hinge on y's lacking x's property of being necessarily identical with x.

The necessary identity theorist may object, at this point, to the short shrift that was made of her position a few pages back. It was denied, in that context, that the truth of this theorem of modal logic requires the invocation of properties corresponding to the identity predicate. But now a modalized property has been invoked. What next? Well, it was also denied that any object a satisfies 'is identical with a' in virtue of a relation it bears to itself. What needs to be shown, I think, is that the necessity of identity is far less contentious than it is thought to be. I shall accept it, but attempt to show that such acceptance is metaphysically innocuous.

The formal argument for the necessity of identity proceeds quite straightforwardly given any true identity statement 'a = b' plus Leibniz's Law. These yield, by universal instantiation, the claim that if a = b, then Fa iff Fb. By taking 'necessarily identical with a' ('N(a = ...)') as a substituend for the predicate-letter F, one derives N(a = a) iff N(a = b). Since N(a = a) is a logical truth, one can infer N(a = b) by modus ponens. From all this one has, by conditional proof: if a = b, then N(a = b). There have been various objections to and qualifications of this argument, for instance concerning the apriori status of 'a = a', and the restriction to statements containing proper names. I am not, however, concerned with these niceties, most of which presuppose that the argument is about identity statements. It is not (cf. Kripke, 'Identity and Necessity', p.137). In any case, the conclusion can be reached in the following

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re modality might block the reduction to propositions for Aristotelian reasons. The fact that the matter realizing itself as that individual (Socrates) could not so realize itself unless it realized itself as human, has nothing to do with language or the necessity of 'a is human'. A second anti-reductionist stand is to construe names as always picking out the object (if names have no content and always have the widest scope). The same holds for indexicals. 'Necessarily, I am human' is really just de re, despite surface appearances. 'I' as used by me always picks out the same object (ignoring problems associated with the notion of a continuing self), and it is asserted of that object that it is necessarily human.

[15] Alonzo Church in 'A Remark concerning Quine's Paradox about Modality'. I rely on Salmon's (1986) account of Church's position.

way.[16]

How is one to interpret 'N(a = a)'? If it is read as 'a is necessarily self-identical', it is no doubt true but unhelpful, for everything satisfies 'is necessarily self-identical'. But not everything satisfies 'is necessarily identical to a'. Now, if anything satisfies this latter predicate, a does. Given, however, that a = b, it is clear that b also satisfies it. Therefore, by accepting statements of the form 'N(a = a)' as true, one is committed to the generalization that, for any names m and n, if 'm = n' is true, so is 'N(m = n)'. It is still unclear, however how one is to determine whether any object satisfies a predicate of the form 'N(F)...'. It might be obvious that a necessary condition is that the object satisfy 'F'. What exactly the sufficient conditions are, is not evident. A possible worlds theorist may propose as a sufficient condition for satisfying 'N(F)' the satisfaction of 'F' in all worlds. Granting that transworld identity is coherent, this proposal still seems circular. For, given an a which is F in the actual world, the issue of whether there is a possible world where this very a is not F would seem to turn solely on one's intuitions about whether a satisfies 'N(F)'. (cf. Kripke, Naming and Necessity, p.267). Perhaps the satisfaction of 'F' throughout its lifetime is a sufficient condition for a to satisfy 'N(F)'. But such satisfaction throughout a life-time can surely be accidental, e.g., the case of a blue chair which is blue as long as it exists, though surely not necessarily blue. What needs to be added would seem to be something akin to Wiggins' substance sortal requirement, where the satisfaction of 'N(F)' means that the appropriate substituend for 'F' yields that specification which maintains a in existence. This is not an obvious role for identity to play, insofar as identity is introduced on the back of existence, so to speak. The most that can be said, for 'a = ...' as substituend for 'F', is that if a satisfies it throughout its history, it may satisfy 'N(a = ...)'. Since a in fact satisfies 'a = ...' throughout its lifetime, its also satisfying 'N(a = ...)' reduces to the truism that if a = b, then a is identical with b throughout its lifetime. This is the uncontentious conclusion of the formal argument for the necessity of identity. Whatever specific reading one wishes to ascribe to 'N(a = ...)' so that the argument goes through, the conclusion will remain uncontentious. This can be seen by considering the following two statements:

(1) If Byron is the author of Beppo, then if Byron limps, then the author of Beppo necessarily limps;

(2) If Byron is the author of Beppo, then if Byron is identical with Byron, then Byron is necessarily identical with the author of Beppo.

(1) alerts one to the fact that statements of the form: If a = b, then (Fa → N(Fb)), are sometimes true.

(2) follows by substituting 'a = ...' for 'F' in (1), not substituting 'N(a = ...)', and has the following

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[16] Pendlebury, op.cit.

form:

If a = b, then (if a = a, then N(a = b)).

It is clear that (2) is equivalent to the desired conclusion of the formal argument, which may be stated, by universal instantiation, as a = b → N(a = b). Note, however, that if 'N' is viewed as expressing more than satisfaction throughout the object's lifetime, thus rendering (2) and the necessity of identity contentious, (1) would be false. Say, for example, that 'N(Fa)' is read as 'Fa in all possible worlds'. Then the consequent of (1) says that the author of Beppo limps in all possible worlds which, if not straightforwardly false, is highly counterintuitive. Surely Byron need not limp in all possible worlds, that disablement is accidental to him. Even granting that he must, 'the author of Beppo' need not refer to him in all worlds. In a world where 'Sophocles wrote Beppo' is true, it does not, and the author of Beppo does not limp. Nothing turns on this example, if it is objected that there is a more intimate modal connection between the creator and her work of art than I have allowed for. The same holds for a more pedestrian example such as the following:

(3) If John Doe is the local disc jockey, then if John Doe is tone-deaf, then the local disc jockey is necessarily tone-deaf.

Again, surely the local disc jockey is not tone-deaf in all possible worlds. The important fact to note is that (2), the equivalent of a = b -> N(a = b), is established as true without ever invoking 'N(a = ...)' as a predicate. It may therefore be conceded that all actual identicals are necessary identicals without invoking either a modalized or unmodalized relation of identity.

Section 5
Continuity and the Coinstantiation of Properties

I now proceed to examine the plausibility of individuation in the absence of sortals. Given the asumption that the notion of identity is exhausted by that of identity at a time, continuity, persistence or endurance through time is not to be viewed as primitive, as a datum. The fact that the current conceptual scheme utilizes concepts of continuants will not make it one either. This Humean starting-point therefore rejects the view that "Enduring is in no need of explanation" (cf. Simons, (1981), p.353) is to be accepted as a methodological principle. But one need not therefore disagree with Wiggins' claim that there is "...no primitive purely synchronic notion of horse" (or whatever) (SS, p.70, fn. 16). The compatibility of these two positions will emerge below. It is not clear that a Humean about identity needs to deny that continuants have a different ontological status than sums, sets or series of momentary things, a difference which makes it proper to ascribe to them a unity and identity over and above that

ascribed to arbitrary sums or series. If identity holds only at a time, continuants must indeed be viewed as sequences of momentary things. But a momentary reconstruction of continuants need not claim that there are no temporal facts which determine the preferred sequences, i.e., it need not be conventionalist. The extent to which a momentary ontology debunks common-sensical notions will depend entirely on the nature of the relation which goes proxy for transtemporal identity. Should it be possible to discover a relation which defines continuants in terms of its intrinsic content, it should also be possible to reconstruct the ordinary ontology. What will not escape unscathed, though, is the Wigginsian overdescription of individuation. What follows serves to substantiate this charge of 'overdescription'.

A first approximation of the sort of position sought in this area may be gleaned from David Lewis's article 'Survival and Identity'[17]. Although he is specifically concerned with the problem of personal identity through time and change, I shall abstract from issues which are peculiar to this problematic in order to arrive at a more general view regarding continuants and their transtemporal identity conditions per se.

Lewis disclaims any desire to reduce continuants to something more basic. His view about continuants as aggregates of time-slices or stages is no more a reduction, he claims, than is the view that trains are maximal aggregates of cars interrelated by the ancestral of the relation being coupled together. He assumes that these stages have temporal duration (i.e., they can be more or less momentary, his are less) although they do not last very long. This aspect of his position reveals why it is a first approximation, for the friend of persistence may legitimately object that such a reconstruction of persistence presupposes it, insofar as the postulated states themselves are said to persist through time. I note this only to shelve it until later.

The relation in which persistence consists, for Lewis, is somehow based on continuity and connectedness. Since the relata of this relation are stages, the interconnection between successive stages is further circumscribed as based on similarity (changes must be gradual) and lawful dependence. The latter of these two necessary conditions is all-important for the overall project. In the present context, its combination with similarity serves merely to underline the insufficiency of resemblance per se as good evidence for identity through time. What is wanted is a counterfactual dependence between the similarity of object b at t2 and object a at t1, such that b is the way it is because a was thus and so at t1. Shoemaker gives the following illustrative example ('Identity, Properties and Causality', p.324), strengthening the above principle by considering rare, localized properties. Take the domain of objects to be all the chairs in a building, all of them same-shaped and same-sized. Suppose that they are rarely the same colour and are repainted once a year, on January 1st. Since new colours are chosen

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[17] Lewis (1983), Philosophical Papers, Vol.1, pp.55-77.

at random, any one chair will have the same colour before and after repainting only by coincidence. If I am asked in December 1988 whether this chair is the same as the red one I saw in February 1988, the fact that this chair is also red might be good, though not conclusive, evidence for an affirmation. Asked the same question in December 1989 of a chair I saw in December 1988, it is clear that sameness of colour is no evidence of identity at all. The point is simply that the redness of the one cannot be relevant to the redness of the other.

Lewis needs to show that he can account for all those 'natural relations' common-sensically taken to be true of continuants without invoking either identity through time or identity between successive stages. He does this by showing the necessary coextensiveness of two weaker relations among states, the S- and I-relations. (I use 'S' for Lewis' R-relation). The S-relation is that relation holding in virtue of continuity and connectedness; to see whether x persists is merely to see whether a later stage is S-related to x-now (similarly for x's past, see whether x-now is S-related to certain past stages). This accounts for the determinacy of x's past and future without sortals. It is clear that S is not identity, it need not be one-one and may be a matter of degree (this takes care of fission and fusion cases of personal identity). More simply, the relata of these relations are different, the temporally indexed versus the temporally extended. Nevertheless, if S holds among stages, it unifies them into the history of a single continuant. Lewis calls this relation holding between the several stages of a continuant the I-relation, it is a 'substitute' for identity among stages. Transtemporal identity questions are now seen to turn on whether stages later than this one are I-related to it, i.e., whether they are stages of the same donkey, star or cabbage. If one takes the aggregate of I-related stages as a mereological sum, as Lewis does, then the stages are literally <u>parts</u> of the continuant concerned. But this construal is optional. Any series of stages defining a continuant need only be, at the formal level, I-interrelated (each one I-related to all the rest) and maximal (a continuant is not part of any larger I-interrelated aggregate). If now, a certain stage D is related to other stages by connections of similarity and lawful dependence, then it is also related to the same stages as those of a single continuant. That is, D cannot be S-related to some future stage but I-related to none or <u>vice versa</u>. But then D is I-related and S-related to exactly the same stages, i.e., the I-relation is the S-relation by necessary coextensiveness. This allows Lewis to broaden his definition of a continuant to that of a maximal S-interrelated aggregate of stages.

The above seems to me to indicate the need for a much more detailed and <u>specific</u> account of the nature of the I- and S-relations. Lewis employs too many problematic notions to convince the continuity theorist. First of all, there are his 'less momentary' stages; these beg the question unless it can be shown that there is some middleground between the instantaneous and the persisting. Perhaps a middleground is needed within the Aristotelian context of unproblematic persistence, and hence where the question of the possibility of change is paramount. Aristotle solves the latter problem by means of unchanging continuants. But then

one can hardly, in the present context, proceed with the construction of continuants by assuming unchanging continuants. Secondly, it is not at all clear by virtue of what the S-relation holds for any specific continuant. If natural laws are the basis for the connectedness between any stages P and Q in the history of x, no argument to this effect has been given. Why believe in non-conventional laws anyway? And if one accepts them, is it not possible that P and Q may be lawfully connected and yet not be parts of a single continuant history?

Perhaps no account of identity through time can be given which does not presuppose persistence at some level. The persistence might, for instance be transposed to the level of properties, construed as abstract objects. Whether properties are in fact to be construed in such a way, I shall not consider at this stage. The examination of something more modest will suffice for the moment. Perhaps persistence simply supervenes on causal relations between different property-instantiations, where it is left open how exactly 'property' is to be interpreted. Shoemaker has written powerfully on this subject, and I shall attempt to follow his thought in this context in order to see how much it accomplishes.

On Shoemaker's account, one distinguishes between those series of stages which are the histories of continuants (i.e., I-interrelated) and those that are not in terms of the counterfactual dependence between those properties instantiated at later and earlier times in the history of the continuant. On this view, change at a continuant level is simply a case of the new properties being a function of the old ones, i.e., there is continuity of properties from stage to stage. This does not mean that all causal relations between stages preserve the same properties, this only happens in some cases. Rather, when a continuant has a property F and later a property G, this can be explicated in terms of appropriate temporal subdivisions which expose the continuous nature of the transition. It is quite clear that one needs to appeal to something more than spatiotemporal continuity as an account of transtemporal identity. This point is repeatedly urged by Wiggins himself. It may, however, be reinforced by considering Shoemaker's rather outrageous example. The example turns on the possibility of having a spatiotemporally continuous series of say, table-stages, (i.e., the causal relations between these stages make them table-stages) which are nevertheless not the history of a single table. Imagine a table-cancelling machine and a table-producing machine, the controls of both of which have been set on my wobbly dining-room table (of course, the controls of the latter have also been set to reproduce that wobbly table exactly). Pressing both buttons at t, there is a spatiotemporally continuous series of the relevant stages, but the nature of the table-stages after t are not a function of those preceding t. The tables are distinct, or rather, a distinct I-interrelated series of stages has replaced another, and spatiotemporal continuity is therefore an insufficient account of persistence. This reinforces the more general Wigginsian point that spatiotemporal position is insufficient for individuation. For Wiggins this is so because two objects of different kinds can coincide in one place at one time. But then a sortal specifying

the relevant kind plus spatiotemporal specification should be sufficient for individuation. However, this combination is clearly powerless in Shoemaker's imagined case. 'Table' plus place and time will not give me the same table. Individuation by functional property dependence can, it seems, make discriminations which a sortal-based individuation cannot (even if the former employs sortals, such use is not taken as primitive). The singling out of my table just prior to t is certainly singling out something with a determinate past and future, something which is the same something as that on which I ate yesterday, something which is one instance of a kind at a place. It is just that, granted these conditions on individuation and one's epistemological access to identity, I still get everything wrong. I take the table after t to continue the history of the table before t. The example is perhaps too contentious to use against Wiggins. In any case, it would need to be made more and more complex in order to deal with all possible objections. What has emerged, however, is that if individuation per se is dependent on individuation under a sortal, then perhaps the latter is itself dependent on more basic relations between different property-instantiations.

But by what right does one appeal to continuity of properties in order to overcome the insufficiency of spatiotemporal continuity? A charge of circularity may be levelled at any philosopher who refuses to take persistence as basic, and yet ascribes properties to momentary things which are intimately connected to persistence. It is a charge which Kripke in fact makes.[18] If states of motion are properties ascribable to things, and there is no reason why they should not be, are they therefore also ascribable to things at a time? On any analysis of transtemporal identity in terms of non-identity relations between momentary stages, this seems impossible. For how can a state of motion characterize a momentary object? How does something existing at a durationless instant move? It would seem that motion is explicable only by means of transtemporal identity.

Kripke illustrates the circularity inherent in a continuity of properties account with the aid of an example, showing that some identity questions are unanswerable by means of it. If the continuity account is correct, the truth-conditions of all transtemporal identity questions are determined by a description of the history of the world. In order not to beg any questions, view this description as a series of Kripkean holographic stages (i.e., a maximal world-description at a particular instant). Since quantification is only over durationless objects, no description may imply the existence of any thing at any moment other than that of the description (it could not say, for instance, that a red cube is moving towards a blue circle). Now imagine that the world described in this manner includes a uniform sphere of homogeneous material. Then the description of that world's history will underdetermine the states of motion of the sphere, i.e., the description will be the same independently of whether

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[18] In a lecture entitled 'Time and Identity'. I rely on the accounts of Shoemaker and Forbes (1986).

it rotates or not. To ask, in this context, whether one portion of the sphere at p at t is the same as the portion occupying p2 at t2, is to ask an unanswerable question.

The continuity theorist might reply that the question is in fact answerable by means of the different counterfactuals true of the shpere when it is either moving or stationary.[19] Take the sphere as stationary. Then the phases of say, the eastern portion from t1 to t2, will bear to each other that causal relation distinctive of different phases of the same thing. The existence of earlier phases will be nomically required by the existence of the latter. But these causal relations will not hold when the sphere is moving. To make this counterfactual dependence more graphic, suppose the eastern portion has 'emerose' scratched on it at t. Also suppose that the sphere rotates 180 degrees between t1 and t2. Then, at t2, the western portion of the sphere has 'emerose' scratched on it. If the sphere has not rotated, then at t2 the eastern portion would have had 'emerose' scratched on it. But if counterfactuals are not barely true, this difference must be grounded in different causal relations between the stages in each case. Now, this response to Kripke will only work if the relevant causal relations are specifiable independently of the idea of motion. But are they? It seems not. Let A be the eastern portion at t1, B the eastern portion at t2 and C the western portion at t2. When the sphere is stationary A = B, and B at t2 is counterfactually dependent on A at t1. When the sphere rotates 180 degrees between t1 and t2, the same sort of counterfactual dependence holds in virtue of causal relations, and A = C. But surely the causally relevant state of A is underdetermined by its size, composition, etc. A has these properties whether the sphere moves or not. Given the transitivity of identity and the fact that B ≠ C, A must have causally relevant properties, in each case, which renders it identical to either B or to C. These can only be the fact that A is either stationary or moving. But this is circular, hence transtemporal identity is not analysable in terms of causality.

The continuity theorist need not, I think, despair. Shoemaker provides an analysis of motion and velocity which does not presuppose the notion of persistence. He works with two notions, that of a "...subclass of spatio-temporally continuous series of states...", and an "...appropriate sort of causal relationship..." ((1980), p.330). Combining the two yields the notion of a causally connected continuous series of stages (CCCS), which is equivalent to Lewis' S-relation. Shoemaker spells it out as being such that "...for each stage S of the series, and for each segment of the series that includes S, that segment includes an earlier stage that stands to S in the appropriate sort of causal relationship." (ibid.). It is then claimed that any momentary stage has a state of motion property (e.g., velocity z at t) only if it is part of a CCCS which has that property. He then asks us to consider "...a case in which a light-source is revolving around a sphere, illuminating one-half of it at any given moment. If the sphere is stationary, or rotating

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[19] Cf. Annstrong (1978).

on an axis other than that on which the light-source is revolving, the series of illuminated hemisphere-stages will not be the history of any particular part of the sphere. Nevertheless, it will have an 'angular velocity' which depends on the angular velocity of the revolving light-source." (ibid., p.330). The reason why the velocities in this case are not those of a persisting object, is simply that the series is not a CCCS. This manner of proceeding does not appeal to persistence; states of motion properties are ascribed on the basis of the instrinsic nature of the series to which a stage belongs. To return to those stages of the eastern and western portions of the sphere called A, B and C respectively. According to the present account, A need not be a persisting thing to have a state of motion ascribed to it, it need only be a stage in a CCCS. Since all continuants are CCCS's (the converse need not hold), only persisting things, so defined, will move. But the notion of identity through time is not presupposed in ascribing a state of motion to a momentary stage, only that of a series interrelated in a specific sort of way.

Shoemaker does not attempt to state necessary and sufficient conditions for Lewis' I-relation. Having shown that some sort of causal dependence between successive stages is necessary to unify them into the history of a single continuant, and that such dependence can include states of motion without fear of circularity, he contends himself with a supervenience claim. Expressed in a possible worlds idiom, it may be put as follows:

(V) If in any world a set S of property-instantiations constitutes the history of a single continuant, then S or its counterpart set will likewise make up the history of a single continuant in any qualitatively identical world.

Here 'qualitative identity' involves the same property-instantiations at the same space-time points, as well as the same causal connections between them (i.e., a world more like the actual one than merely nomologically accessible). Note that Shoemaker's supervenience claim is a weak one, it is not concerned with the transworld identity of the respective continuants, but merely with the transtemporal unity of any qualitatively identical series of stages. There is no commitment here to a transworld version of the Identity of Indiscernibles.[20]

If momentary stages are thought of as sets of simultaneous property-instantiations, the above idea may be expressed by saying that identity or persistence through time is nothing over and above the holding of causal and spatiotemporal relations between sets of simultaneous property-instantiations. This seems like extreme reductivism, to say the least. The Humean debunking of common-sense has now, it seems re-emerged. But Shoemaker lays such fears to rest by proposing a specific theory of properties, to which I now turn.

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[20] Cf. Forbes (1986) and Salmon (1981)

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