Structure in Ontology – 22/11/2007

The Identity of Material Objects

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1. **"One object to one place"? Synchronic identity and material constitution.**
2. **Persistence-through-change or temporal parts? Diachronic identity and change.**

- Given that there are so different competing theories of the metaphysical structure of material objects, we may expect them to provide different characterization of their **identity conditions**: the conditions under which an entity counts as *one*, it is articulated from the rest of reality overall as *one single thing*.

- Material objects, as we know, have among their fundamental features an unrepeatable location in *space*, and in *time*. So the problem of identity conditions can be divided into two:

(1) **Synchronic identity:** we want our theory to provide us with criteria to *count* how many objects there are, and in particular how many of them occupy a certain place at one time. Questions of synchronic identity are often intermingled with questions concerning the **material** and **mereological constitution** of material objects.

(2) **Diachronic identity:** we want our theory to tell us under which conditions a material object keeps its identity through time, it remains "the same" object (it keeps existing) while undergoing minor or major changes. Questions of diachronic identity typically involve the classic problem of accounting for the phenomenon of **becoming**.

1. "One object to one place"? Synchronic identity and material constitution

- **Locke's Principle** claims: *two material objects of the same sort cannot occupy the same place at the same time.*

- This seems to be analytically entailed by one of the features of material objects we have examined: they are *concrete*, that is, completely filling the content of the region of space they occupy. But how do the various theories on the structure of material objects behave with respect to Locke's principle? All depends on what one takes "same sort" to mean. I will pick two of our five theories, which appear to be committed to opposite positions on synchronic identity.

1.1 More than one object to one place

- The interesting case comes with the *theory of substance*. Mainstream sortalism entails that **two things** satisfying different sortal predicates can **be in the same place at the same time** (Wiggins [2001]). The place currently occupied by this book now cannot be occupied by another *book* at the same time. However, this book and the amount of printed paper that composes it belong to different *sorts*, and despite being exactly *here*, they count as *two* material objects.

- The intuition is that the book is *made of* paper, but it *is* not (identical with) the paper it is made of. Two main kinds of argument to sustain the intuition can be found in the literature:

(a) *Modal arguments* involving modal predicates: the book *could* be made (say, partly) of different paper; and if we chopped the book by removing the paper, the paper *would* still be there, but the book would be destroyed; so there are modal features that make the difference, and the book is not the paper that composes it.

(b) *Temporal arguments* involving temporal predicates: the sheets of paper existed *before* the book, e.g. when the book was being printed by the publisher, but the pages hadn't been assembled together yet. So there is a temporal feature that makes the difference.

- These arguments are applications of the Indiscernibility of Identicals, which we already know, and which is also called Leibniz's Law:

(InId)   If $x = y$, then for every property P, $P(x)$ iff $P(y)$.

- Leibniz's Law or (InId) is employed as a tool for establishing ontological distinctions in its contraposed form:

(ContInId) If there is some property P, such that $P(x)$ and not $P(y)$ (or *vice versa*), then $x \neq y$.

  in order to ascertain whether x is distinct from y, let us look for something true of x but not of y, for some property that x, but not y, instantiates. So we can distinguish the book from the paper it constitutes, because there are some modal or temporal properties that make the difference (the book *could* be made of different paper, but the paper obviously couldn't; the paper *existed at time t*, when the book didn't exist yet, for the pages hadn't been assembled). This line of thought has its subscribers: Wiggins [2001], Fine [2003], Lowe [1989], Johnston [1992], Baker [1997], Thomson [1998].

- The theory of substance and sortals is particularly suited for this point of view: the distinction between two co-located objects can be corroborated by the fact that the theory assigns them to different *sorts*: one is a *book*, the other is an *amount of printed paper*, and since they "have different criteria of identity associated with them, and […] no individual of a sort ϕ can intelligibly be said also to belong to a sort ψ if ϕ and ψ have different criteria of identity" (Lowe [1989]: 70), we have two co-localized things of different sorts.

- But this faces various problems:

(1) The *modal supervenience thesis*: modal and temporal properties can only supervene on actual properties (Jubien [1993], Levey [1997], Sider [1999], and Olson [2001]). It is usually claimed that, say, B-properties (properties of a certain kind) supervene on A-properties (of a different kind), iff there could be no difference in the B-properties instantiated by something without there being a difference in the A-properties instantiated by that thing (for instance, reductionist accounts in the philosophy of mind claim that mental properties supervene on physical properties, in the sense that the features of our thought, our mental life, depend entirely on our physical and material constitution, so there could not be a mental difference not grounded on more fundamental physical differences). Now, the book and the paper it is made of share all of their *actual* properties: same size, shape, colour, overall weight, location, etc. If modal and temporal properties supervene on actual properties, where could their alleged modal differences come from?

(2) The *circularity argument* (Della Rocca [1996], Varzi [2000], [2002]). The distinction between the book and the paper composing it begs the question against those who claim that they are one and the same object. To stick just to the modal version: it is claimed that the book *could* be made of different paper; and that if we chopped the book by cutting away the various pages, the paper would still be there, but the book would be destroyed. But this *presupposes* that the book and the

paper constituting it are two different things. Suppose that what we refer to with the expression "the book" *is* the same thing as what we refer to with the expression "the paper composing the book" – which cannot be ruled out beforehand, on pain of a *petitio principii* against those who want to have only one object there. We could apply Leibniz's Law the other way round and claim that:

(a) The paper constituting the book [*this* particular thing], can be severed and survive;
(b) The book *is* the paper constituting it;
(c) ∴ The book can be severed and survive.

Now, it may sound strange to claim that a book can be split into the pages that constitute it and survive, but this is, at most, a linguistic oddity, with no metaphysical import.

(3) *The reproducibility argument* (Varzi [2007]). If the argument for having two things in the same place at the same time worked, it could be reproduced *ad absurdum*. We may easily find a modal property that makes the difference between this *book* and, say, *the thing which is composed exactly of its page 143 and of the rest of it*. One may argue that the book could lose his page 143 (we would call it the same book, after all), but the thing made exactly of page 143 and of the rest of the book, by definition, could not lose its page 143. So they are distinct. We could reason the same way for each other page of the book. So we would have *hundreds* of co-located objects here, in the place occupied by this book – and this seems preposterous!

1.2 One object to one place

- According to this "monistic" position, there is **only one object** in a certain region of space at a certain time. The book and the paper composing the book are one and the same thing, but *described* in different ways. We can resort to some descriptions when we want to highlight certain features of the object, whereas we resort to different characterizations when we focus on different features.

- This monistic position is particularly suited for the *stuff theory*: since the only "sort" around is precisely the sort *material object*, and this is taken as meaning only: "spatiotemporal occupier", then it is impossible that two material objects occupy the same place at the same time. Locke's Principle can be assumed in its strongest form (Sidelle [1989], Heller [1990], Jubien [1993]).

- This was also David Lewis' position:

  We have one thing. What we have two of, besides names for it, are ways of representing. There is some kind of equivocation built into representation *de re,* and the equivocation shows up when we get conflicting answers. […] It reeks of double counting to say that here we have a dishpan, and we also have a dishpan-shaped bit of plastic that is just where the dishpan is, weighs just what the dishpan weighs (why don't the two together weigh twice as much?), and so on. This multiplication of entities is absurd on its face" (Lewis [1986], p. 252)

- So the overall picture is: we have an object which occupies a certain region of space, and which does have certain properties (in some versions of the stuff theory, we have only *a region of space* which displays certain properties, and that we tend to carve and qualify as an "object"). All predicates work as *role-playing* predicates: they point, when true of an object (or of a region of space) at the role that object (or that region of space) can play because of its having certain properties.

- Of course, *before* the pages of the book were tied together, it would have been inappropriate to call *this* thing a "book". The pages had not been arranged in the right way yet. But :

This does not mean that, at that point, the book didn't exist yet […]. It means only that at that point the object in question was not a book yet, that is, it did not fulfil the requisites for satisfying the predicate "book" (whereas it fulfilled the requisites for satisfying the predicate "amount of paper") (Varzi [2007]: 26).

2.   Persistence-through-change or temporal parts? Diachronic identity and change

- The problems of diachronic identity for material objects have to do with the conditions under which we can claim that **a material object, x, which exists at time t_1 is the same as a material object, y, which exists at time t_2**. This is the traditional problem of **change** and of **becoming**.

- On the one hand, we have the strong intuition according to which material beings can in many circumstances *persist through change*: this chair, which is red at t_1 (say, in the morning) can be painted in blue at t_2 (say, in the evening), and nevertheless be *the same* chair, for its colour is an accidental feature of the object.

- On the other hand, this idea seems to fly in the face of Leibniz's Law (say, in contraposed form):

(ContInId)   If there is some property P, such that $P(x)$ and not $P(y)$ (or *vice versa*), then $x \neq y$.

It seems that Leibniz's Law requires that the chair x, which has the property of being red at t_1, be different from the chair y, which does not have the property of being red (it's blue!) at t_2. So the problem is: how can something be *qualitatively different*, but *numerically the same*?

- The problem, though, is in a sense easily solvable. The basic idea is that we should pay attention to the suitable temporal qualification, that is, we should understand rightly such claims as:

x is P at time t,

for the obvious intuition is that the chair is red and blue (therefore, not red), but this is no problem since we can introduce a temporal parameterization: it is not [red and not red] at the same time, but red *at time t_1*, that is, in the morning, and blue *at time t_2*, that is, in the evening. But *how* do temporal qualifications of the form "at time t" enter into play? Here the proposals diverge.

2.1 Three-dimensionalism and persistence through change

- **Three-dimensionalism** attaches the qualification "at time t" ("in the morning", "in the evening") to the predicate, so we have:

(1)   The chair is [red in the morning]
(2)   The chair is [blue in the evening]

- This view dates back to Aristotle's *Metaphysics*, XIII, and *Physics*, I. According to it, **material objects are three-dimensional things**: they extend along the three dimensions of space, and have spatial parts; but they do not have temporal parts. It is also called (after Lewis [1986]) *endurantism*: things like a chair **persist through change by being wholly at more than one time**, or precisely, by being entirely present **at each moment of time at which they exist.** The intuition that an object persists through change can be harmonized with Leibniz's Law by claiming that the attribution of temporal properties is the attribution of properties relative to a certain moment of time, at which the object exists.

- Three-dimensonalism has many subscribers – probably the majority among nowadays analytic ontologists: for instance, Wiggins [1980], [2001], Davidson [1985], Dau [1986], Simons [1987], Lowe [1989], van Inwagen [1990], Rea [1998]. It has the advantage, according to many, of sticking to commonsensical ideas about material objects, so it fits with the trend of "descriptive" metaphysics.

- Three-dimensionalism is *forced* to attach a (possibly implicit) temporal qualification to *any* predicate which does not express an essential and permanent feature of the material object in question (such as, e.g., "being a chair"). Each time we claim that the chair has a certain shape, or temperature, or weight, etc., all these claims should be considered as implicitly indexed to times, for we want to save the intuition that (numerically *one and*) *the same* chair can change from one temperature to another, etc. etc.

- According to some, three-dimensionalism faces the so-called *problem of temporary intrinsics* (Lewis [1986]: 203-4), that is to say, of intrinsic properties of enduring things that change from time to time. To claim that temporary intrinsic properties must be relativized to times is to misrepresent them as relations to times: redness should be a *property* of the chair, not a *relation* of the chair to some time. Similarly, having a bent shape should be my *property* insofar as I am sitting, not a *relation* I bear to the time at which I am sitting:

  Contrary to what we might think, shapes are not genuine intrinsic properties. They are disguised relations, which an enduring thing may bear to times. […] The solution to the problem of temporary intrinsics is that there aren't any temporary intrinsics. This is simply incredible, if we are speaking of the persistence of ordinary things. (It might do for the endurance of entelechies or universals.) If we know what a shape is, we know that it is a property, not a relation (Lewis [1986]: 204).

2.2 Four-dimensionalism and temporal parts

- **Four-dimensionalism** attaches the qualification "at time *t*" to the *subject*, so we have:

(3)   [The chair in the morning] is red
(4)   [The chair in the evening] is blue

- According to this view, **material objects are four-dimensional things**: they extend not only along the three dimensions of space, but also along time. Four-dimensionalism is also called (after Lewis [1986]) *perdurantism*: things perdure in time because they have **temporal parts,** which are present at different times. The objects themselves, as composed of different temporal parts, **are never wholly present**. So when we claim that the chair is red in the morning, what we claim is that the chair-which-is-in-the-morning (that is, a certain *temporal part* or *stage* of the chair) is red; and when we claim that the chair is blue in the evening, what we claim is that the-chair-which-is-in-the-evening (that is, a different temporal part or stage of the chair) is blue.

- We can stick to the vernacular, and keep claiming that material objects "persist through time and change"; but now, the reason why they persist is that their temporal parts come one after the other in time.

- Now there is no need to relativize properties and predicates to times, and to consider predicates devoid of an explicit temporal qualification as elliptic: temporal stages have their intrinsic properties *absolutely* (this temporal part of the chair is *red*, full stop), because different temporary features of material beings are ascribed to different temporal stages.

- Sentences like (3) and (4) are not different from such claims as:

(5)   The chair is red on its top

(6)   The chair is blue on its bottom

Just as (5) and (6) are compatible because they ascribe redness and blueness not to the chair as a whole, but to different *spatial parts* of the chair (its top, its bottom), so (3) and (4) are compatible because they ascribe redness and blueness to different *temporal parts* of the chair (its morning-stage, its evening-stage).

- Also four-dimensionalism has its subscribers – Quine, first of all, but also Carnap [1928], Whitehead [1929], Goodman [1951], Lewis [1986], Heller [1990], Jubien [1993]. Four-dimensionalism is far less conservative than three-dimensionalism with respect to our commonsensical intuitions (try and think of ordinary material beings as "**space-time worms**", as the usual four-dimensionalist story goes!). It goes towards strongly prescriptive or revisionist metaphysics. Some have claimed it is "mad metaphysics" (Thomson [1983]: 210). But according to its supporters, four-dimensionalism can match with **relativistic physics** and the idea of a space-time *continuum* much better than traditional three-dimensionalism.

- Also some commonsensical talk seems to show that we sometimes treat material objects as having temporal parts:

(7)   The *fin-de-siècle* Paris was awesome;
(8)   The second Wittgenstein hated metamathematics.

- Four-dimensionalism can become an *eternalism* (that is to say, a theory that dismisses *the very idea of change*). Peter Simons [1998] (following others: Mellor [1981], Lombard [1994]) has objected that to claim that change is just the having of different properties by different temporal stages is not much to *explain* change and becoming, but to *deny* it! When we claim that the left third of the French flag is blue, and the middle third is white, and the right third is red, we are not obviously pointing at any *progression*. Analogously, to claim that the morning-temporal-stage of the chair is red, the evening-temporal-stage of the chair is blue, is just to point at a temporal *diversity*, at different temporal parts. We have missed the very idea that change should be a temporal *process*.

- A possible reply: this is not a *con*, but a *pro* of the theory! (Heller [1992]) It means that temporal change is not more mysterious than the having of different properties of different spatial parts: that things change, within four-dimensionalism, means that different temporal slices of things have different properties; which is as simple to grasp as to grasp the fact that different spatial parts of things have different properties (red here, white there, blue over there).

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