HOW TO ENDURE AN ALLEGED PARADOX

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In recent work, Stephen Barker and Phil Dowe (2003; 2005) argue—through what they call *the mereological paradox*—that a certain theory of persistence, viz., endurantism, is contradictory. In this paper, I take issue with Barker and Dowe's argument. In addition to disarming an interesting philosophical argument against endurantism, my diagnosis of Barker and Dowe's mereological paradox underscores what is central to the endurantism/perdurantism debate and reveals the inadequacy of a familiar way of describing enduring objects. I begin with the alleged paradox.

I. THE MEREOLOGICAL PARADOX

Endurantism is the thesis that objects persist by being wholly present at every time at which they exist. What is it for an object to be wholly present at a time? It is surprisingly difficult to say. Non-controversial definitions of 'x is wholly present at time t' are hard to come by. Various proposals for defining the concept of being wholly present at a time or nearby concepts are in the offing and can be found in Crisp and Smith (2005), Hawley (2001), Hudson (2001), McKinnon (2002), Merricks (1999), Rea (1998), and Sider (2001). Such a definition, however, is not needed for my purposes here. All that is needed here is that we have an intuitive grasp of the concept of being wholly present at a time. For instance, Barker and Dowe (hereafter 'B&D') do not provide a definition and they have at least a firm enough grasp of the concept to offer an argument against endurantism. The extent to which they grasp the concept of being wholly present is strong enough for what I will say below.

The mereological paradox proceeds under the assumption of four-dimensionalism or what is sometimes called *eternalism*. This is the thesis that in addition to the present time and presently existing objects there are also at least merely past times and merely past objects and perhaps merely future times and merely future objects, as well. The important point for B&D's argument is that if eternalism and endurantism are both true, then some objects are wholly present at distinct times, such objects are *multiply located* throughout time. It is this feature—the multiple-location of enduring objects—that B&D seek to exploit. I develop their argument below.

Suppose eternalism and endurantism are true. Consider an enduring object, O, and suppose that it persists throughout, and so is multiply located throughout, a four-dimensional space-time region, R. Then, there is a foliation of R into time slices, the rs, such that O is wholly present at each of the rs. (I ignore, as do B&D, complications that arise with the introduction of special relativity. I take it, though, that their argument and my response could both be stated within a relativistic framework.) Moreover, at each r, there is an object, O_r, that is wholly present at r. Now consider the mereological sum of the O_rs, $F(O_r)$. B&D argue as follows:

(i) Each such O_r is a 3D entity, since it is located at a 3D sub-region r. O_r is an entity with non-zero spatial extent and zero temporal extent. Each O_r is identical to every other. So each O_r, is identical with $F(O_r)$. So, $F(O_r)$ is a 3D entity.

(ii) $F(O_r)$ has parts at every sub-region of R. So it has non-zero spatial and temporal extent. $F(O_r)$ is a 4D entity.
Conclusion: $F(O_r)$ is both 3D and 4D, but that is a contradiction since *being 3D means having no temporal extent*, and *being 4D means having temporal extent* (my emphasis added). (Barker and Dowe 2003: 107)

One response to the mereological paradox available to the endurantist is to reject eternalism. But to concede that B&D have shown the conjunction of endurantism and eternalism to be impossible is premature. Before arguing for this, I will make explicit how B&D understand the expression 'temporal extent', and I will make a harmless simplification to their argument.

In B&D's argument above, 'temporal extent' is used so that the temporal extent of a space-time region is the magnitude of that region along the temporal dimension, where magnitude of a space-time region along a dimension is a geometrical-*cum*-topological feature. (Likewise, spatial extent of a space-time region is the magnitude—again a geometrical-*cum*-topological feature—of that region along some spatial dimension.) By way of example, since each of the *r*s—instantaneous regions of space-time—has no magnitude along the temporal dimension, each of the *r*s has no temporal extent; *R*, however, (the union of the *r*s) does have magnitude along the temporal dimension and thereby has temporal extent.[1]

The harmless simplification I will make is to step (i) above. I will drop talk about the O_rs and talk instead about O and the *r*s, the time slices at which O is wholly present. This is harmless since B&D assume that each of the O_rs is numerically identical with every other and so, also with O. This modification not only simplifies matters but also makes it all the more obvious that $F(O_r)$ just is O. The revised version of (i), then, is this:

(i*) O is a 3D entity, since every r at which O is wholly present is a 3D sub-region. O is an entity with non-zero spatial extent and zero temporal extent. But O just is $F(O_r)$. So, $F(O_r)$ is a 3D entity.

II. DISARMING THE PARADOX

Throughout this section, I will speak as an eternalist-endurantist. I will proceed by arguing that B&D's argument is invalid. In particular, I will argue that a sub-argument contained in step (i*) is invalid. Moreover, I will argue that there is an independently well-motivated reason for eternalist-endurantists to deny the conclusion of the sub-argument in question. To begin, let us consider more explicitly the lately mentioned sub-argument:

(P1) Every r at which O is wholly present is a 3D sub-region.
Therefore,
(C1) O is a 3D entity.

This argument may strike you as obviously valid. This, however, is mere appearance. The impression of validity is I think affected by the use of '3D' in both the premise and conclusion. But a closer look at what B&D mean by 'is wholly present at a 3D sub-region' and 'is a 3D entity' in (P1) and (C1) respectively reveals that there is no good reason for thinking that (C1) follows from (P1). B&D's argument—in particular the portion of their conclusion I emphasized—make it clear that they take 'is a 3D entity' to mean 'has no temporal extent'. Given this reading of 'is a 3D entity', (C1) is equivalent to:

> (C1*) *O* has no temporal extent.

Furthermore, given the most natural interpretation of 'is wholly present at a 3D sub-region *r*', (P1) is equivalent to:

> (P1*) Every *r* at which *O* is wholly present is *a region with spatial extent (magnitude along spatial dimensions) but no temporal extent (no magnitude along the temporal dimension).*

Now, it is not at all obvious that (C1*) follows from (P1*); indeed, it seems to me—especially *qua* eternalist-endurantist—fairly obvious that it does not follow. Why should we think that *O* has *no* temporal extent—again, no magnitude along the temporal dimension—just because it is wholly present at every one of the *r*s each of which has spatial extent but no temporal extent? Though B&D do not explicitly defend the inference in question, they do endorse the following principle, which they could use to defend the inference:

> If an object Z is wholly located at region X, then the topological/dimensional properties of Z are possessed by X; they match.[2] (Barker and Dowe 2005: 72)

Given this principle, it would follow from the proposition that *O*—again, an entity wholly present at each of the *r*s—has temporal extent, that each of the *r*s has temporal extent. But none of the *r*s has temporal extent, and so, neither does *O*.

The problem with this defence of the inference from (P1*) to (C1*) is that no eternalist-endurantist should be at all inclined to accept B&D's topological/dimensional principle, for which, incidentally, B&D do not argue. Indeed, an eternalist-endurantist has the following good reason to deny the principle in question: Since *O* is wholly present at each of the *r*s and *R* is the union of the *r*s and *R* is a region with temporal extent (a region with magnitude along the temporal dimension), *O* too must have temporal extent (magnitude along the temporal dimension) unlike the *r*s at which *O* is wholly present. So, contra the above principle, it's possible for an object Z to be wholly present at a region X and for (at least some of) the topological/dimensional features of Z to not be possessed by X. Of course, the above reasoning also provides eternalist-endurantists with good reason to deny (C1*). Accordingly, an eternalist-endurantist should deny (C1) given B&D's interpretation of 'is a 3D entity'. An eternalist-endurantist, then, has good reason not only

to question the validity of the argument from (P1) to (C1) but to outright deny its conclusion as well.

Someone might object by pointing out (quite rightly) that if *O* is temporally extended, then *O* has *many* temporal extents. For there are many proper sub-regions of *R* each of which is extended along the temporal dimension as well as being divisible into time slices at which *O* is wholly present. Peter van Inwagen (1990: 252) for instance—himself an eternalist-endurantist—notices that if an enduring object is temporally extended, then it has many temporal extents. Van Inwagen concludes from this that enduring objects *fail* to be temporally extended. This is unfortunate and unnecessary. It is *unfortunate* because it suggests a misconception of the debate between endurantists and perdurantists. In particular, it suggests the misconception that perduring objects but not enduring objects are temporally extended. Van Inwagen's conclusion is *unnecessary* because all that follows from an enduring object having many temporal extents is that it fails to have a *unique* temporal extent. (Notice, however, that even though *O* has many temporal extents, *O* can still have a greatest temporal extent.) But there is nothing obviously paradoxical about an enduring object failing to have a *unique* temporal extent. Indeed, since a perduring object would also be extended along proper sub-regions of the largest four-dimensional region it exactly occupies, it too would have many temporal extents. Any proposed reason then for thinking that an object cannot have many temporal extents would pose as much trouble for perdurantism as it would for endurantism.

So far I have challenged B&D's mereological paradox for endurantism by challenging the sub-argument in step (i*) from (P1*) to (C1*). And this I have done by considering and rejecting one reason—viz. the one in terms of B&D's topological/dimensional principle—for thinking that (P1*) adequately supports (C1*). Perhaps, though, there is some other way of shoring up the inference from (P1*) to (C1*). B&D endorse another principle—what they call *the part/whole location principle*— they take to underwrite the argument contained in step (ii). Perhaps the part/whole location principle is also implicitly intended to underwrite the inference under discussion. Here is the part/whole location principle:

> WLP: If an entity *W* and space-time region *R* are such that for some division of *R* into sub-regions *r*, *W* has a part *p* located at each sub-region *r*, then *W* is located at *R* and is a 3 or 4D entity according to the dimension of *R* itself. (Barker and Dowe 2003: 109)

It is important to note that in order for WLP to support the inference from (P1*) to (C1*) '3D entity' and '4D entity' need still to be read as 'has no temporal extent' and 'has temporal extent' respectively. Given this, it does appear that (C1*) follows from the conjunction of WLP and (P1*). For consider one of the *r*s. Presumably, this *r* is divisible into sub-regions such that *O* has a part at each of these sub-regions. From WLP, it follows that *O* is located at *r* and is a 3D entity since *r* is three-dimensional. Given B&D's interpretation of '3D entity', it follows that *O* has no temporal extent, which is just what (C1*) says. While validity has been restored, the argument of step (i*) still fails. There are two reasons why the appeal to WLP is unhelpful.

First: The problematic ambiguity in uses of '3D' reappears in WLP. It does so in the phrase, 'and is a 3 or 4D entity *according to the dimension* of *R* itself', my emphasis.

This is just to say, 'and is a 3D entity if *R* is a 3D region and is a 4D entity if *R* is a 4D region'. Our earlier question was why we should think that *O* has no temporal extent *simply because* it is wholly present at regions that have spatial extent but no temporal extent. As I argued above, there is no obvious good answer to this question and there is a very good reason for thinking that *O* is temporally extended although it has no unique temporal extent. In short, WLP fails to provide a compelling answer to our earlier question. For it simply assumes the truth of the very issue raised by the question. It is no wonder then that from (P1*) and WLP, (C1*) follows. Moreover, WLP does not suggest any explanation of what goes wrong with the earlier argument from eternalism and endurantism to the proposition that *O* is temporally extended.

Second: If WLP were true, it would spell just as much trouble for perdurantism as it would for endurantism. Consider a perduring object *O** and the four-dimensional space-time region *R** that *O** exactly occupies. There is a foliation of *R** into three-dimensional sub-regions the *r**s such that *O** is only partly present at each of the *r**s. From this and WLP, it follows that *O** is a 4D entity, that is, that *O** has temporal extent. So far, so good; but not for long. For consider an *r** at which *O** is partly present. This *r** is also divisible into sub-regions such that *O** has a part at each of these sub-regions. From this and WLP, it follows that *O** is a 3D entity since *r** is a three-dimensional region of space-time. That is, it follows that *O** *does not* have temporal extent. So, *O** *has* and *does not have* temporal extent. Do we now have an argument for the impossibility of both perdurantism and endurantism? No. What we have is an argument for the falsity of WLP. (So, the fate of the mereological paradox is overdetermined. For as I said B&D employ WLP in their defence of step (ii) and since WLP is false, said defence fails.) Like the appearance of the argument from (P1) to (C1) being valid, here too I suspect that the initial intuitive appeal enjoyed by WLP can be traced to a failure to notice the different ways '3D' and '4D' are used in the principle. Is there some other plausible principle that can do the work needed to support B&D's argument? While I do not know how to *show* that there is not, the prospects for there being such a principle look very dim. I leave it as a challenge for someone to formulate such a principle.

My objection to B&D's argument exploits their own interpretation of '3D entity'. One might attempt to reinstate paradox by stipulating a different meaning to the expression. The only other suggestion I can think of is to use '3D entity' to mean 'enduring entity' or 'entity that is wholly present at every time at which it exists'. Given this reading, (C1) and the conclusion of step (i) are both obviously true. We are supposing, after all, that *O* is an enduring entity. However, in order for B&D's main conclusion to be contradictory, we must also stipulate '4D entity' to mean 'perduring entity' or 'entity that is *not* wholly present at every time at which it exists'. This latest suggestion only serves to relocate a similar problem. While step (i) is now beyond reproach, step (ii) becomes problematic. To see this recall step (ii):

> (ii) $F(O_r)$ has parts at every sub-region of *R*. So it has non-zero spatial and temporal extent. $F(O_r)$ is a 4D entity.

Given our new stipulated meaning of 'is a 4D entity', we can set out the argument of step (ii) as follows:

(P2) $F(O_r)$, i.e. O, has parts at every sub-region of R.
Therefore,
(C2) $F(O_r)$, i.e. O, is a perduring entity or an entity that is not wholly present at every time at which it exists.

The problem now is that there is no good reason to think that (C2) follows from (P2). No eternalist-endurantist should feel any pressure to accept that just because O has parts at each of the rs, O is a perduring entity, an entity that is not wholly present at every time at which it exists. A corresponding revised version of WLP is of no help here either:

> WLP*: If an entity W and space-time region R are such that for some division of R into sub-regions r, W has a part p located at each sub-region r, then W is located at R and is *an enduring or perduring entity according to the dimension of R itself*.

WLP* is as problematic as its cousin. It too relocates the problem. Before we wanted to know how (C2) followed from (P2). Now we want to know why we should believe WLP*. Why should O count as a perduring entity *just because* it is located at a four-dimensional region of space-time? Also, we have good reason not to believe WLP*. For it too would spell trouble for perdurantism and endurantism alike. Reconsider O*, a perduring entity partly present at a three dimensional region of space-time, r*. Recall that r* is divisible into sub-regions such that O* has a part at each of these sub-regions. From this and WLP*, it follows that O* is an enduring entity, an entity wholly present at every time at which it exists. So, O* is a perduring entity and an enduring entity; contradiction. WLP* is simply false.

In short: reinterpreting '3D entity' and '4D entity' to mean 'enduring entity' and 'perduring entity' respectively is of no help in rescuing the mereological paradox. No other plausible way of interpreting those expressions suggests itself and I conclude that B&D have not shown eternalist-endurantism to be contradictory.

III. THE BEARING ON ENDURANTISM V. PERDURANTISM

There is, then, no mereological paradox for eternalist-endurantism. Moreover, I resubmit that given eternalism and endurantism there is a compelling reason for believing that enduring objects are temporally extended. Of course, perduring objects are temporally extended, as well. This area of agreement between endurantists and perdurantists sheds light on what is central to their dispute. What is at issue between endurantists and perdurantists—B&D's mereological paradox and my diagnosis thereof serve to emphasize this—is *how* persisting objects manage to be temporally extended not *whether* they are. This is an underappreciated point since enduring objects are sometimes described as objects that are not extended across the temporal dimension. As we have seen, this is B&D's implicit description of enduring objects and as we've seen, it is this description that is ultimately the undoing of the mereological paradox. Moreover, Peter van Inwagen also describes enduring objects this way when he says,

> Thus, in saying that [Descartes] was a three-dimensional object, the [endurantist] means that he has a greater-than-zero extent in each of the three spatial dimensions—and that's all. (Van Inwagen 1990: 252)

This, however, is not how enduring objects should be described if eternalism is true. Such a description fails to take the eternalist-endurantists' claim that enduring objects are multiply located across space-time seriously. What is true of an enduring object, *O*, given eternalism, is that *O* is temporally extended by virtue of being wholly present at various distinct times at which *O* exists, i.e., by virtue of being multiply located. A perduring object, *O**, on the other hand, is temporally extended by virtue of being only partly present at various distinct times at which *O** exists.

The above is not a maximally informative account of the distinction between enduring and perduring objects since I have not here said what it is for an object to be wholly present at a given time. (See Crisp and Smith (2005) for my preferred account of whole presence.) However, the account is informative enough to make it clear that the issue between endurantists and perdurantists is not over *whether* persisting objects are temporally extended, but rather over *how* they are temporally extended. Moreover, the account does allow for a sense of '3D' that applies to enduring objects and a sense of '4D' that applies to perduring objects. Enduring objects can be said to be 3D by virtue of being wholly present at distinct times at which they exist and perduring objects can be said to be 4D by virtue of being only partly present at distinct times at which they exist. Finally, as we have seen, the account is informative enough for the purposes of defending endurantism against B&D's mereological paradox.[3]

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[1] This use of 'temporal extent' is implicit in Barker and Dowe's (2003) and it is explicit in their (2005: 72).

[2] I'm indebted to an anonymous referee for this journal for suggesting that I consider B&D's topological/dimensional principle as a way of defending the inference from (P1*) to (C1*).

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