

## ***Four Dimensionalism—Reading group 3***

In this chapter, Sider characterises more precisely endurantism (roughly: the view that objects are three-dimensional and are wholly present at any particular time) and perdurantism (roughly: the view that objects are four-dimensional ‘spacetime worms’, with temporal parts at particular times). He takes this to be an important task, because “our doctrines have often been misleadingly or obscurely formulated” (p. 54).

### **Chapter 3: Three- and four-dimensionalism stated**

#### **Four-dimensionalism stated**

The first things which Sider seeks to formalise are the notions of (i) temporary parthood, (ii) overlap, and (iii) instantaneous temporal parthood. Here’s how he puts these (pp. 57-59):

**P@T:**  $x$  is part of  $y$  at  $t$  iff  $x$  and  $y$  each exist at  $t$ , and  $x$ ’s instantaneous temporal part at  $t$  is part of  $y$ ’s instantaneous temporal part at  $t$ .

**PO:** If  $x$  and  $y$  exist at  $t$ , but  $x$  is not part of  $y$  at  $t$ , then  $x$  has some part at  $t$  that does not overlap  $y$  at  $t$ .

**ITP:**  $x$  is an instantaneous temporal part of  $y$  at instant  $t$  iff: (i)  $x$  exists at, but only at,  $t$ ; (ii)  $x$  is a part of  $y$  at  $t$ ; (iii)  $x$  overlaps at  $t$  everything that is part of  $y$  at  $t$ .

As Sider states, “Four-dimensionalism may then be formulated as the claim that, necessarily, each spatiotemporal object has a temporal part at every moment at which it exists” (p. 59). He then goes on to give the following provisos about his view:

*Four-dimensionalism as I have stated it merely implies the existence of temporal parts. It does not imply that temporal parts are in any sense prior to or more fundamental than the objects of which they are parts. Nor does it imply that objects are ‘constructed’ from their temporal parts. Nor does it imply that identity over time is reducible to temporal parts.* (Sider p. 60)

*My statement is likewise neutral about the relationship between temporal parts and ordinary language. A four-dimensionalist is free to accept any number of possible views about this relationship. On the worm view, it is spacetime worms that are continuants—the referents of ordinary terms, members of ordinary domains of quantification, subjects of ordinary predications, and so on. This is the usual view adopted by four-dimensionalists. On the stage view, on the other hand ... it is instantaneous stages rather than worms which play this role. (Sider pp. 60-61)*

Sider's latter point here is this: the *semantics* for temporal objects can come apart from the *metaphysics*. (For related discussion, see Wallace, *The Emergent Multiverse*, ch. 7.)

### Three-dimensionalism stated

Sider now turns his attention to three-dimensionalism. As he writes,

*The precise formulation of four-dimensionalism in the previous section answers van Inwagen's charge that temporal parts are unintelligible. Ironically, it is far from clear that three-dimensionalism can be adequately formulated. (Sider p. 63)*

As we have already seen, roughly, the idea of three-dimensionalism is that "a continuant is 'wholly present' at every moment of its existence" (p. 63). But making the idea of 'wholly present' precise is a tricky business. Here's Sider's first suggestion:

**SWP:**  $x$  is strongly wholly present throughout interval  $T$  iff everything that is at *any* time in  $T$  part of  $x$  exists and is part of  $x$  at *every* time in  $T$ .

As Sider points out, however, this is too strong a thesis:

*But the claim that objects are always strongly wholly present throughout their careers is too strong a formulation of three-dimensionalism, for it entails the impossibility of gain or loss of parts. Granted, some three-dimensionalists would accept this consequence, most notably Roderick Chisholm (1976, app. B). But Chisholm's mereological essentialism should not be built into the statement of three-dimensionalism, for most three-dimensionalists reject it. (Sider p. 64)*

That said, there might still be a way of defining three-dimensionalism using **SWP**. Sider suggests the following three options (p. 66):

**3D-1:** In the *actual* world, small particles (e.g. electrons) are strongly wholly present throughout their careers.

**3D-2:** It is possible that some continuant is strongly wholly present over some extended interval.

**3D-3:** Necessarily, every continuant is *possibly* strongly wholly present throughout some extended interval.

But each of these has problems. **3D-1** “seems too empirically bold” (p. 66). The invocation of possibility in **3D-2** makes it seem too weak: “there is a nagging feeling that something is missing” (p. 66). **3D-3** is couched in *de re* modal notions (we can discuss!) which are very tricky to deal with themselves.

Given all this, Sider concludes this section with some scepticism about three-dimensionalism as a positive metaphysical view:

*A core positive thesis behind the three-dimensionalist picture has proved elusive. But this does not mean that we cannot proceed, nor does it mean that our discussion must be inherently vague. For three-dimensionalists are united in their opposition to four-dimensionalism, which has been precisely stated. If there is anything else to three-dimensionalism beyond this opposition, then I challenge its defenders to say what it is. (Sider p. 68)*

### **Perdurance, endurance, presentism, and eternalism**

Recall that we’ve already seen a number of debates in the philosophy of time:

1. Eternalism/presentism/growing block.
2. A-theory/B-theory.
3. Dynamic/static.
4. Perdurance/endurance.

Focussing on (1) and (4) and ignoring the growing block view for simplicity, Sider notes that terminology “leaves open any of the four possible combinations: eternalism + perdurance, eternalism + endurance, presentism + endurance, presentism + perdurance” (p. 68).

As we’ve already discussed, it’s not easy to see how the presentism + perdurance option will work. Motivated by curiosity, Sider suggests tweaking **ITP** to make it acceptable to a presentist (p. 71):

**ITP’:**  $x$  is an instantaneous temporal part of  $y$  iff: (i)  $x$  is part of  $y$ ; (ii)  $x$  overlaps every part of  $y$ ; (iii) it is not the case that  $\text{WILL}:(x \text{ exists})$ ; (iv) it is not the case that  $\text{WAS}:(x \text{ exists})$ .

Presentist perdurance can then be defined as: “Necessarily,  $\text{ALWAYS}:(\text{every object has a temporal part})$ ” (p. 71).

Note that there’s no notion of spacetime worms on this presentist perdurance view. In light of such points, Sider writes,

*While there is no question that this thesis is a coherent view that is consistent with presentism, some may hesitate to call it a thesis of genuine perdurance. (Sider p. 72)*