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ORIGINAL ARTICLE

A Sketch of a Presentist Theory of Passage

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Abstract In this paper I look to develop a defence of "presentist temporal passage" that renders presentism immune from recent arguments due to Eric Olson. During the course of the paper, I also offer comment on a recent reply to Olson's argument due to Ian Phillips. I argue that it is not clear that Phillips' arguments succeed.

1 Olson on Passage

Erik Olson (2009) has recently argued that "dynamic" theories of time are shown to be false by simple consideration of:

THE QUESTION: how quickly does time pass?

These "dynamic" theories are to be understood, thus: 'certain times or events are absolutely present, and there is continual change in respect of which ones they are. (2009, p. 3)

Here, in summary, is Olson's argument:

(1) *The question* must have some answer given a dynamic theory of time:

> 'if a change in a scalar quantity takes place during a period of time, it must take place at some rate'. (Olson, 2009, p. 4). Since dynamic theories require that time *passes*, and *passage* is a change, so we must have some answer to *the question*.

(2) "One-second per second" is not an answer to *the question*:

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> "One-second *per* second" is just one-second divided by one-second, and the product of that sum is one. "One" doesn't express a rate of change so does not answer *the question* (Olson, 2009, Sect. 4).

(3) Claiming that time passes at some rate per some other unit of change is not an answer to *the question*:

> 'if time passes at one hour per circuit of the big hand, and the time it takes the big hand to go round is one hour, does it not follow that time passes at one hour per-hour?' (Olson, 2009, p. 7)

(4) 'There is no rate' requires us to *deny* that time passes and that is false if dynamic theories are true (Olson 2009, p. 8)
(5) The putative answers specified in (2)–(4) are exhaustive
(6) Given (1), (2), (3), (4) and (5), a dynamic model of time both must, and cannot, answer *the question*. Thus, the dynamic model of time is false.

My claim in this paper is that the presentist has a perfectly sensible way in which to side-step this objection. To begin, I consider a recent reply to Olson's argument that has been offered by Ian Phillips. I conclude that the line of argument is not *obviously* strong enough to defeat Olson. In the sections that follow I outline how (or so I claim) presentists should think about temporal passage and argue that the presentist line that I take is immune to the argument that Olson puts forward. This is not, of course, to say that all presentists must endorse the line taken here: rather, my intention is simply to show that there *is* a viable presentist line that can be taken in response to these objections.

2 Why Believe (2)?

Phillips (2009, p. 503) claims that there's an elementary error in Olson's argument. 'A rate is a *ratio of two quantities*, a relation one quantity bears *to* another.' Thus, although we might concede that 1-s *divided by* 1-s is one (and that *this* doesn't express a rate of change), "1-s per second" is not an instruction to divide 1-s by 1-s; '"1-s per second" is a ratio of time to unit time, a relation between two amounts of time' (Phillips 2009, p. 503).

So Phillips thinks that we can defeat Olson's charge. Indeed, we're given a general diagnosis of the issue.

> "It's easy to be misled here. Fractions or quotients can sometimes be used to *express* ratios (and rates), at least as long as we know what it is we are expressing. But ratios are not fractions. A fraction is simply one number divided by another. Thus, $n/n = 1$, where $n \neq 0$. In contrast, a ratio, $n{:}m$ is *the relation* one quantity bears to another. It does not equal one even if $n = m$." (2009, p. 503)

Phillips offers us an illustration to help clarify: suppose that we end up exchanging $1' \times 1'$ blue tiles for *other* $1' \times 1'$ blue tiles at a rate of 1:1. Clearly, we can still express the rate at which the tiles are exchanged even though one $1' \times 1'$ blue tile *divided by* $1' \times 1'$ blue tile is "one". The rate is this: one $1' \times 1'$ blue tile *per* one $1' \times 1'$ blue tile. That *is* a meaningful rate.

Contra Phillips, there remains a worry. Phillips is right that, "1-s per second" is *intended* to state a relation that one quantity bears *to another*. But, in the case of *time's* passing, there is no *other*; there is no relation that one quantity can bear *to another*. Rather, there is a quantity (1-s) bearing a relation to *itself* (1-s): that is what we get if we have a rate of "1-s per second".[1] Now, if as per Philips' suggestion, we *define* a rate as a relation that one quantity can bear to *another* then, absent an "other", we have no rate!

The proper analogue with the temporal case, then, would be a situation in which where there exists only one $1' \times 1'$ blue tile that we then try to exchange. But here problems arise. Specifically, first, I want to challenge Phillips' assertion that we have an intelligible rate on our hands. Second, and more pressingly, I want to argue that *even if we do have a rate*, we don't *obviously* have a rate of change.

First, in the case described above where there exists *only* a single tile, it doesn't seem as if we can have a "rate of exchange" expressed in terms of blue tiles. What *other* blue tile could we exchange our tile for, such as to have a *rate* of exchange? Doesn't the very idea of a rate presuppose the existence of more than one instance of a tile? As Phillips (2009, p. 503) puts it, and as I alluded to above: 'a rate is a ratio of *two* quantities'. Where is the second quantity? If we allow, in line with Phillips' definition, that a rate is a relation of two quantities then there must be two non-identical entities to be related in a rate.

So, absent a second quantity—some second blue tile, perhaps, or (in the temporal case) something other than "1-s"—it isn't *clear* that we have a rate; either in the tile case or the temporal case.

Second, it isn't enough that Phillips establishes a *mere rate*; what Olson's argument requires is a rate of *change*.[2] In the case of the single tile, if there was only one tile, and we tried to set about exchanging that tile for blue tiles, then, since there is only one tile, the result would simply be that we kept the tile! Clearly, in such a case, there's no change: the number of tiles owned does not change (the act of exchange requires my interlocutor to give me with the very tile I give them); there is no change in ownership of the tile (since the point at which I give my interlocutor the tile is the same point at which they return the tile to me). Even allowing, then, that there is a rate when we have only a single quantity, it's far from clear that it is a rate of *change*.

The proper conclusion to draw, however, is not that Phillips has no available line of reply. As I said in the forgoing, all that has been established is that *it is far from clear that we have a rate of change* on our hands. That lack of clarity, present in Phillips' line, is what concerns me. As a dynamic theorist of time, I take it as a

[1] Or if Phillips thinks that there is some *other*, we're owed an account of what it is.

[2] As noted in the first quotation from Olson, we need there to be a *rate* at which what is present, *changes*. Thus, we require not merely a rate, but a rate of change.

desideratum of my theory that it is *clear* that it satisfies a particular objection; not merely that we can cast doubt on whether or not my view is shown to be false. That being the case, I deny that Phillips' argument has done enough to satisfy a determined interlocutor.

I shan't divert us any further with considerations of why we might reject (2). Perhaps something can be said to resuscitate Phillips' line, but the more obvious point of attack, especially for the presentist, is (4).

3 Presentism and the Lack of a Prima Facie Problem

Here, I assume presentism, the view that only the present exists. I shan't say anything about how the presentist is to deal with various problems that afflict their view;[3] how to *properly* define presentism;[4] or how to motivate the view.[5] My focus here is narrow since I am merely concerned to show that the presentist has, at their disposal, the resources to give an account of the rate of time's passage. The account that I give denies that there *is* a rate to time's passage. In this section I explain the view, before going on to defend it in latter portions of the paper.

The presentist can deny that there *is* any such *thing* as time, and so prima facie can deny that time passes. To be clear, let me offer comparison with the B-theory of time. The B-theory states that the reality of time consists in the existence of fixed and permanent relations of "earlier than" and "later than". Thus, or so goes the thought, "time" could be identified with a dimension, or a network of B-relations.

If you're a presentist, your ontology doesn't include any such "network of temporal relations" or "dimension of time". So where the B-theorist might treat time as a *thing* (*as* a network or *as* a dimension), the presentist *can't* treat time as any such *thing*. There's no analogous entity in the vicinity with which we might identify time. If there's no such *thing* as time, then (strictly speaking) there's no such thing as 'time' that passes. Thus, the presentist *can* claim that "time passes" is false.

Because there is no such thing as time, it's at least prima facie unproblematic if there is no answer to the question "how fast does time pass?"

4 Why Think There's a Problem for Presentism?[6]

A presentist who doesn't believe in a *thing*, time, still believes that things change. I am, after all, 1 day older today than I was yesterday. But, if there's no such *thing* as

[3] For an excellent exposition of many of the problems facing presentism, see Sider (2001, chap. 2).

[4] For discussion, see Crisp (2004a, b), Ludlow (2004) and Meyer (2005).

[5] Typically, the presentist appeals to the intuitive lure of their view by way of motivation (see, e.g., Bigelow (1996, p. 36) and Tallant (2009b) for some brief discussion of other salient intuitions).

[6] This is a development of the kind of view that Markosian (1993, pp. 839–840) dismisses on the grounds that we ought to believe that passage consists in a change in which A-properties an event instantiates. Unlike Markosian, I deny it is literally true that 'time passes'. See Sect. 6 for concerns with Markosian's strategy.

time, with respect to which one can age, either quickly or slowly, then there are no days or hours. How, then, do we age? How quickly do we do so?

Let's begin with the second question. Rates of change can *only* be expressed in (useful terms in) ratio with other changes. For example, in relation to a single revolution of a "big hand" of a clock we might expect to see: elite half-marathon competitors change their location by a little over thirteen miles; a car on a dual carriage way change its location by around sixty miles; a passenger plane change its location by several hundred miles. Because rates of change can only be understood as one species of change with respect to another, the answer to 'how quickly have I changed?' is, properly, that I've undergone a given number of changes in my physiology per number of changes in my environs.

(It's easy to go on to say what sorts of changes in my environs are the relevant ones. Formally, "1-s" is defined as 9,192,631,770 oscillations of the caesium atom. In terms more conducive to the presentist so described: 9,192,631,770 *changes* occur in a caesium atom per movement of the "narrow hand" of a clock about a clock-face. As to changes in *me*: any non-stable atoms involved in my constitution will decay at a rate of a given number *per* 9,192,631,770 oscillations of a caesium atom,[7] and various other sorts of regular change—around twelve alpha cycles of brain-wave per 9,192,631,770 oscillations in a caesium atom, for instance.)[8]

Thus, to answer the first question, *I will age by a number of changes*. We don't age by units of time (because strictly speaking there are no such *things*); we age by the number of changes in us.[9] Because *change in us* (indeed, change in any individual thing) can be expressed in ratio to changes in our environs, so we age at a given rate.[10]

5 Some Replies

We might then ask, "how quickly does *everything* change?" If *everything* is changing, then there is no further changing entity with respect to which *everything* can change at a given rate. Thus, we've re-stated (a version of) the objection.

To begin, we are not *committed* to there being a "thing" that we call "the universe" that itself changes at a given rate.[11] And whilst it might be true that "all existing things" change at a particular rate, clearly we can understand the rate at which those things change in terms of how quickly each individual thing changes. To illustrate, it might be true of a football team that it changes formation and that it

[7] Thus generating the Becqurel: the number of decays per "second".

[8] It's plausible that, in order to talk of 'the changes' the presentist may have to invoke span-operators: see Brogaard (2007) for discussion.

[9] There's a clear Aristotelian overtone, here. See Coope (2005) for a discussion.

[10] And because rates of change in me and my environs occur in a regular relation to one another, so we are able to mark my ageing by reference to occurrences in our environs—one orbit of the earth about the sun, for instance.

[11] So I deny universalism about composition. That's not an unusual move for presentists to make. Markosian (1993, 1998) takes this view. The term "the Universe" then simply picks out all objects that are spatially related to one another, but is not itself a "thing".

does so at a particular rate; but we can explain this it terms of each *individual* on the team changing location with respect to yet other changes (perhaps the rotation of a clock-hand about its face), rather than in terms of some entity, "the team", changing formation. Since each individual can change location at a given rate with respect to the other individuals in the side we can still talk meaningfully about rates of change of the team, provided we understand the change in the team in terms of change of its' members. In the same way: we can understand talk about how quickly "everything" changes, by virtue of how quickly "every thing" changes.[12]

There might still be a problem lurking: suppose that it's true to say of our world that the only change that occurs is the oscillation of a single caesium atom. If there can be a change in an individual thing, unaccompanied by a change in any other, then it would seem that we have a change that occurs at no particular rate.

In reply, we might deny that *this* sort of change would have to occur at a given rate. As allowed above, changes *only* occur at a given rate when they occur in a given ratio with another change. The mere occurrence of a change does not entail that the change occur at a given rate. To repeat the claim made above, changes occur at a given rate *only when they occur in a particular ratio with one another.* Were it to be the case that a lone Caesium atom were the only thing in the universe to change, then there would be no informative answer to the question "how quickly did the Caesium atom oscillate?".

Is this fatal to presentism? No. If, as I've claimed, ageing is simply a matter of changing, and if changing *only* occurs at a particular rate when entities change in particular ratio to one another, then a single changing object won't age at any given rate. Absent a good reason to think that this is false (and Olson *doesn't* provide one), I see no reason to think all dynamic theories false.[13,14]

The presentist also agrees that certain changes have occurred in the last few days. More precisely, we can say that certain changes (in whatever object Olson chooses) have occurred in a *particular ratio* to the 9,192,631,770 oscillations that have occurred in existing caesium atoms.[15] (If we're asked how quickly the Caesium atoms have changed, we need simply give some *other* change (perhaps the rotation of sun about the Earth) in order to specify the rate at which the Caesium atoms have changed.)[16]

[12] For discussion of the "everything", "every thing" distinction, see Lowe (1997, p. 613).

[13] Olson (2009, p. 4) does say that, "But if a change in a scalar quantity takes place during a period of time, it must take place at some rate." But since I deny that there is such a thing as a "period of time", such an argument does not impugn my view. Recall, my claim is that there *are* no entities in our ontology "units of time", but that change occurs. Thus, I do not deny (1). I endorse the counterfactual: were there such a thing as 'time's passage', the associated change would have to occur at some rate, but deny the antecedent.

[14] The presentist might not be committed to such a move: for instance, the presentist *might* say that there is rate of change, but that the rate should be expresses as a ratio of changes in the caesium atom with respect to *merely possible* changes.

[15] Does that mean that we cannot have time without change? Yes, since there is no such *thing* as time. To see what goes wrong with Shoemaker's (1969) argument to the effect that we *can* have time without change, see Warmbrod (2005).

[16] See Tallant (2009a) for discussion of what 'grounds' talk about the past (and future) for the presentist.

6 Missing the Point?

Markosian (1993, p. 830)—a presentist—talks of passage in the following way.

> Time is unlike the dimensions of space in at least this one respect: there are some properties possessed by time, but not possessed by any dimension of space, in virtue of which it is true to say that time passes.

Thus, the thought goes, the presentist *must* be committed to the thought that there are temporal properties unlike those that are had by the dimensions of space, and it is in virtue of a change in which objects bear these temporal properties that it is true to say that time passes.

The natural way to understand this is that there is some property of "presentness", and that which event bears that property, changes. Since the property is "moving"—changing bearer—it must do so at a particular rate. We're back at Olson's conclusion once more.

But I don't see that the presentist *is* forced to suppose that there is any such temporal property. All that the presentist requires is the truth of the slogan "everything that exists, exists now". The very same notion is (plausibly) alluded to by saying "nothing exists at any temporal distance from anything else" [c.f. Crisp (2005)].[17]

7 Obviously Wrong

We clearly talk about time's passing and "hours of time". Given our every-day commitment to the truth of such talk, and my denial of its literal truth, surely the presentist view I've outlined is false.

Not so. I grant, as I surely must, that objects change *and* that objects change at a given rate. What I don't see, then, is a pressing need to allow that there *are* such things as hours or minutes of time. As a presentist, I don't believe in the existence of a *thing* called "time", or "temporal passage".[18]

I still believe in the "reality of time",[19] provided by that we mean nothing more than that things change, and by virtue of some things changing, new things come into existence. That *seems* to be enough for the reality of time.[20]

So whilst I may grant the truth of sentences such as, "I'm going home in one hour", what I take to be required to make that true is that there *will* be appropriate changes in my environs prior to my going home: that, and nothing else.[21]

[17] Thus, the key difference between the view that Markosian (1993, p. 835) defends, and the view that I take here, is that I deny what Markosian calls the "pure passage of time thesis"; the thesis that different times and events successively bear A-properties. As per fn6, this leads to us disagreeing as to whether or not 'time passes' is literally true. I say that it is not.

[18] So, just as the nominalist might seek to paraphrase away commitment to abstract objects by providing paraphrases committed only concrete objects, so I seek to paraphrase away commitments to "hours" (and the like) by providing paraphrases that talk of changes.

[19] And the *metaphor* that, "time passes".

[20] We might, I suspect, also require that there are truths about the past and future.

[21] A referee worried that it might still be possible to object to the proposal, on the grounds that the presentist must provide some surrogates for past and future times (perhaps these might be ersatz-times—

8 Conclusion

Time does not pass given presentism. Change occurs in individual objects, and, as has been shown, it is perfectly sensible to ask how quickly some change occurs in any given object *with respect to* any other. That, however, is as much as we can say. Fortunately, it is also as much as we *need* to say in order to preserve presentism, a dynamic theory of time.

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Footnote 21 continued
Crisp (2007)), and that these surrogate "times" will, then, become "instantiated" or "realised" at a particular rate. However, following both Lowe (2006, p. 287) and Merricks (2007, p. 125), I do not think that the presentist should reify times, at all, and so 'times' will not come to be 'instantiated' or 'realised'. Second, I follow Sanson and Caplan (forthcoming) in thinking that the presentist ought not to commit themselves to any such surrogates for talk about the past and future (similarly, see Merricks (2007, pp. 142–145)). That being the case, it's hard to see how to develop this kind of objection—at least in its current guise.