

Time Primitivism

Pendaran Roberts

Abstract. I present a novel view on the nature of time: primitivism. This view is the conjunction of two theses: that presence is concreteness and that the present changes, where change is a fundamental process that cannot be analyzed. After explaining this view in-depth, I look at how it explains the flow of time and solves many puzzles, for example, McTaggart's famous paradox about the unreality of time.

1. Introduction

I have never felt satisfied with the dominant views in the philosophy of time: presentism (only the present exists), eternalism (the past, present, and future exist), and their derivatives (e.g., growing block theory: only past and present exist). These views seem to include no intuitive mechanism to explain the flow of time from one second to the next. If the past and/or future do not exist, how do we get from one second to the next? A river cannot flow from nowhere to nowhere.¹ If the past and/or future exist, then why is today the present and not yesterday? Intuitively, there must be something metaphysically special about the present. The growing block theory attempts to answer this by saying that the present is the part of reality that just came into existence, but it does not explain why yesterday is not today for us: why we are not conscious *in* yesterday. These basic arguments are not designed to convince anyone that these mainstream

¹ Obviously, the river is a metaphor but makes an intuitive point. It seems like to capture the intuitive idea that times flows we need to be able to talk about the past and future, so that there is somewhere for time to flow from and flow to. However, if you deny the existence of the past and/or future then it is unobvious how to do this.

views are false. However, they are sufficient reason to investigate whether a different kind of view might be available: one that is not defined using statements about what exists.

The new view I propose is time primitivism. This is not a view about what exists. It accepts that dinosaurs exist, Socrates, tomorrow, and the year 3000, but this is not how the view is defined.² Time primitivism is the view that time is a fundamental thing that cannot be defined in non-temporal terms. Hence, time cannot be reduced to a dimension nor understood as part of a 4D space-time. Time primitivism is the combination of two primary theses:

Concretism: The property being present just is the property being concrete. To be present is *not* to be located at some point on the time dimension. It is not a certain amount of time. The present, thus, can persist through time, because it is not itself a time. A corollary of the present being concrete is what I call “abstract time:” the past and future are abstract.

Change: What is present can change. Change is not to be reduced to having different properties at different times. Change is a primitive and fundamental process, I call “becoming,” whereby time is taken up or used up in order to concretize an abstract thing. Objects remain present by being concrete.

Concretism has some affinity with existence presentism, so I will here provide a quick contrast between this view and primitivism. Tallant (2014) states existence presentism as the view that presence is existence. I will stick to this formulation. Like existence presentism, primitivism makes an identity claim for presence (the primitivist need not consider this a reduction; more later). However, primitivism rejects existence presentism for the following reason: The number 2 is not present but exists. Primitivism cannot accept that the number 2 is present, because the

² Does time primitivism meet the definition of eternalism then? If eternalism is defined broadly enough, then sure it can meet that definition. However, the conceptual framework eternalists have used to date is completely different from that of time primitivism. Eternalism really is the view that the past, present, and future all exist in space-time (4-dimensionalism). Primitivism accepts that the past, present, and future all exist but rejects that they exist in space-time or space or anywhere in fact. Many things (probably most), according to primitivism, exist nowhere at all.

number 2 is not a concrete thing. It is an abstract thing. The primitivist thinks this is the right result: All things in the present can change (the passing of time in the present implies the possibility for change); the number 2 cannot change; so, the number 2 is not present.

Time primitivism has some affinity with Sider's (2011, p. 215) Williamsonian Passage (WP, for short), which he states as these theses: 1. Tense operators are primitive; 2. the current perspective is fundamental; and 3. instances of temporal Barcan (and reverse Barcan) schemas are true (for example, if there once existed dinosaurs, then there are things that were dinosaurs).^{3,4} WP can be interpreted as saying that past dinosaurs are abstract and that concreteness is a temporary property some things have when present (for example, dinosaurs). I recognize the appearance of a similarity, but WP is, in fact, quite different. Time primitivism accepts 1 and 3 but rejects 2. What 2 means is that x exists iff x is now. Thus, WP is a kind of presentism, given my (albeit simple) taxonomy. Primitivism does not accept that there is any fundamental perspective. As I said, the number 2 exists but does not exist now. WP implies that there are past dinosaurs iff there are now past dinosaurs (2011, sect. 11.9). Primitivism rejects this. Past dinosaurs exist but they do not exist now. For past dinosaurs to exist now would require that past dinosaurs be concrete things in space, which would be absurd.

³ Sullivan (2012, p. 166) proposes "The minimal A-theory:" 1. Something is temporarily located at some region of spacetime; 2. Everything always exists; 3. Objects can exist but have no properties (or substantially less properties than we ordinarily think). Her view is a novel attempt to develop a simple A-theory compatible with WP. However, her view seems to differ more from primitivism than WP. Primitivism rejects 1, because it does not accept that space-time exists. Primitivism, of course, accepts 2. However, primitivism rejects 3: primitivism accepts that objects have many essential properties (see Sect. 4). As Sullivan's view is quite different from primitivism, I must, for practicality, concentrate on the other views mentioned.

⁴ The terminology "the current perspective is fundamental" is not mine. It is from Sider (2011). What it means is that the present is the only perspective. Sider explains it this way: "Thus the presentist accepts $\phi \leftrightarrow N\phi$, for all ϕ . "Jones sits", S_j , is true iff Jones now sits; "Everything is sitting", $\forall xSx$, is true iff all current entities are currently sitting" (p. 286). Primitivism accepts that there are past dinosaurs existing in the past. Past dinosaurs have properties like being an animal or being a reptile. So, primitivism rejects $\phi \leftrightarrow N\phi$.

Finally, it is worth contrasting primitivism with the moving spotlight theory (MS). I look to Deasy (2015; 2017) to articulate this view. MS says that 1. some instant of time is absolutely, non-relatively present, and 2. that it is always the case that everything exists eternally. Deasy actually thinks of WP as a kind of MS where there are many temporary fundamental properties. Classical MS though holds that there is just one temporary fundamental property: “the instantaneous property of presentness” (2015; p. 2077). Given my simple taxonomy, MS is a derivative of eternalism, like growing block theory, because it is defined (in part) by an eternalist claim about existence. Putting aside whether Deasy correctly interprets WP as a kind of MS, we can ask whether either moving spotlight theory is primitivism? Primitivism accepts 2, for it holds that the past, present, and future exist. Primitivism, though, rejects 1. No amount of time is present, because the present is not an amount of time.⁵ How many temporary fundamental properties are there? Primitivism rejects the 4D approach as fundamental, so the answer is “lots.”

In the next three sections, I explain primitivism in more depth, looking at the first thesis, *Concretism*, and its corollary, *abstract time*, and then the second thesis, *Change*. The primary purpose of these sections is to explain time primitivism, not argue for it. However, as will become apparent, thinking of presence as concreteness and change as a primitive process by which the abstract becomes concrete (and vice versa) intuitively explains the flow of time and other temporal puzzles. Hence, in the final and fifth section, I work to show that time primitivism is a plausible theory that is worthy of consideration. I do this by explaining directly how time

⁵ In fact, if we were to use Deasy’s definitions of the A- and B-theory (2015; 2017), primitivism would be a B-theory like eternalism, but to say this is more confusing than helpful. Primitivism should reject Deasy’s taxonomy. However, I find it fun to try to place primitivism within Deasy’s taxonomy. Given the taxonomy, primitivism accepts the B-theory: that no instant of time is absolutely, non-relatively present. Primitivism would also accept Permatism: that it is always the case that everything exists eternally. This would make primitivism a kind of four-dimensionalism. However, primitivism also accepts that there are many temporary fundamental properties. So, primitivism is four-dimensionalism plus the view that there are many temporary properties, according to the taxonomy Deasy sets out. Classifying primitivism this way is more confusing than helpful.

primitivism intuitively accounts for the flow of time better than the other views. I next examine how time primitivism solves various other paradoxes and puzzles in the philosophy of time like McTaggart's paradox (1908), fatalism, the thickness of the present, the nature of simultaneity, and others.

2. Concretism

Being present just is being concrete. To be concrete is to exist *in* space, but fundamentally, concreteness is defined ostensively. To be concrete is to be like *this stuff*, pointing to the tables and chairs around you in space, to their properties, and even inwards towards your own thoughts. It is a very broad concept that captures everything that exists *in* space. Thus, we could say that to be *this kind of stuff* is to be present. Everything in space is connected spatially: Everything in space stands in spatial relations to everything else in space (above, below, left, right). So, we can also understand being concrete as being spatially connected, but the idea of spatial connection is itself primitive and understood ostensively. To be spatially connected is to be like *this*, pointing to the stuff around you. A corollary is that, as every region of space is spatially connected with every other region, every region of space, no matter how large or small, is a concrete existent. Concretism should not be confused with the view that to be present is to *take up* space.

Primitivism accepts that there is a difference between being in space and taking up space. My chair's blackness is in space but it does not take up space. Colors do not have spatial dimensions, only shapes. Nevertheless, my chair's blackness is where my chair is: to the right of my cat's blackness.⁶

⁶ A rejoinder is to say that necessarily, if my chair's blackness is where my chair is, my chair's blackness is the shape of my chair. In reply, things can be located in space by taking up space or by being instantiated by objects that take up space. It is this distinction that allows the primitivist to accept that property instances can be concrete (they are in space where they are instantiated but take up no space). In other words, the time primitivist rejects the view

Concretism implies that the passing of time is a concrete thing. The passing of every second is present and so is a concrete thing, although no amount of time is present. If this seems odd, this is probably due to thinking of the present as an amount of time. The present cannot be an amount of time. If, let us say, a second is present as it passes, then the present would be a second long. However, once half of the second passed, that first half is no longer present. This is a contradiction: the first half of the second is present (by assumption) and past (deduced). So, time does not pass concrete reality like a car passes a finish line in a race. A finish line has some spatial width just like the car itself does, but the present has no temporal width. No amount of time is ever present, because the nature of time is to always be passing (more later). Thus, it is a category mistake to say that the passing of a second is identical to a second. A second, of course, takes a second to pass, but the passing of a second is concrete and so present. A second is never concrete and so never present (nor any part of it). It is the passing of a second that is concrete and happening now, not a second (or any amount).

If the passing of time is concrete, then its passing is in space. However, the passing of time takes up no space. We cannot point to the passage of time like we can physical objects or see it. However, we can prove it is in space. Every change takes up time. That is, every change has the passing of some amount of time as an essential part. If a process is part of something, then that process must be where that thing is. Thus, the passing of time is a concrete thing in space. Extrapolating from this, we can see that it is passing everywhere in space, which is not the same as nowhere (the number 2 is nowhere, but the passing of time is everywhere). Time, of course, does not permeate space like a gas or substance. Time cannot be used up in any region.

that if something is in space, it takes up space. My cat is beautiful, so his beauty is where my cat is, but his beauty has no shape and takes up no space. If this sounds strange, think of being in space as being in the *place* where material objects can be located and subject to change.

There is infinite time available. Regardless, changes take time, just as concrete objects take space. You may run out of time in your day for more changes; likewise, you may run out of space in your house for more stuff. Time and space themselves, though, cannot run out.

The idea that the passage of time is a concrete thing in space that takes up no space, which we cannot see, may seem mysterious. However, the primitivist would argue that it is less of a mystery than it first appears. The primitivist would say that we must conceive of any region of space as a concrete existent. Once we have space, we must have the passage of time, because it is impossible to conceive of even an empty void where no time passes. Obviously, not being a spatial object but a temporal entity, time cannot take up any space. Further, the primitivist says that time is only a considerable mystery if we insist on understanding it in non-temporal terms. Accept it for what it is and the mystery at least becomes much more manageable. Time necessarily passes in space, and our epistemic access to this passage is undeniable. How exactly we sense time, though, I admit, is unclear: Can we see it directly like colors or do we extrapolate its existence from our experiences? Further discussion of our epistemic access to the passage of time is best left for a paper on this subject.

I think it is important here to distinguish time primitivism from quietism. Time quietism is the view that it is a conceptual mistake to try to say what time is. The quietist may hold this for a variety of reasons but perhaps the most obvious is that he thinks that time is not an entity or thing that can be referred to (similar to the quietism of Wittgenstein), and so nothing deep or interesting can be said about what it is. Primitivism is not an anti-metaphysical view. The primitivist accepts that passing time is a real, concrete process that exists in space. It thus rejects quietism. Where it agrees with quietism though is that like this view it accepts that time cannot be reduced or understood in non-temporal terms. Space necessarily has in it, although it takes up

no space, temporal succession: the temporal “then.” Moments are always becoming new moments. The primitivist holds that this is a real and concrete process, and that we can refer to it.

Before moving on to look at the past and the future, I want to address the elephant in the room: Is not concretism a reductive thesis? In other words, how can a primitivist view have as a central tenant a reductive claim? One possibility is to say that the identity statement is a conceptual truth that has gone unnoticed (see Roberts, 2016 for discussion of “conceptual truth”). One may respond that this is unduly dismissive. For example, one may insist that eternalists easily imagine past and future concrete things. The primitivist who goes with this option, thus, must give an account of “conceptual truth” whereby something can be a conceptual truth even though it is entirely unobvious. Another option is for the primitivist to say that concretism allows for us to intuitively account for change as a primitive process. It is acceptable for the primitivist to endorse a reductive thesis if doing so allows for accommodating for the flow of time via a *sui generis* process. I prefer the former solution. I think eternalists are not imagining concrete things in the past and future but the past and future being present and so concrete. I will not push for this view further.

Two more things before moving on. In the introduction, I mentioned a brief argument for the claim that the number 2 does not exist presently. However, one might respond, “it is true that the number 2 exists now, because the number 2 is relevant to the world now.” In reply, I would say first that the number 2 does not need to exist now to be relevant; it can exist timelessly, which is to exist but not to exist in any temporal sense. Second, I would say that it does not make sense to hold that the number 2 exists now. To say that something exists now, it must be possible for it to be located: time is everywhere, my cat is over there, my thoughts are in my head. Being two of something is a locatable property (e.g. being two marbles), but the number 2 is different

from this property: it cannot be had by anything. Hence, I reject the position that the number 2 exists now. The number 2 exists as an abstract thing and it does so “outside” of space and time, which is equivalent to saying that the number 2 exists but is not the type of thing that exists anywhere or “anywhen.”⁷ I think this is an intuitive and common-sense position.

One may accept my claim about the number 2 but insist that there are things that exist now that do not exist concretely; specifically, it is now the case that there were dinosaurs. In reply, due to the confused 4D framework, many think that to talk of the past requires designating where we are on the timeline, and that the use of “now” somehow does this. In other words, we may think that every time is present relative to that time, so we must know which time we are talking about to say what is in the past and future. However, not every time is present relative to that time, because the present is not a time. So, the use of “now” in the relevant sentence is not only unnecessary but also conceptually (or metaphysically) confused. It is not now the case that there were dinosaurs; it is simply the case that there were dinosaurs, and this is a claim about the past and not a claim about the present. To see this, remember from the introduction that the primitivist accepts that if there once were dinosaurs, then there are things that were dinosaurs, call them “past dinosaurs.” Obviously, past dinosaurs exist in the past, not the present.

3. Abstract time

I said before that the passing of time is a concrete process. As primitivism holds that to be present is to be concrete, it follows that past and future times must be fundamentally different in nature from the passing of time. This is where we get into the realm of abstract time. Abstract

⁷ One might reply that we do not have a conception of existing outside of time, but we do have such a conception. I have shown that using the arguments against the idea that the number two exists now. The number 2 exists. It does not exist now, and it certainly does not exist only in the past and/or future. So, it must exist timelessly.

past seconds are no longer passing; they already passed (in series). However, we can track each abstract past second and how far away (temporal distance) it is from the present by tracking with a clock how many seconds passed since that second passed.⁸ Similarly, for future seconds we can track how many seconds will pass before that second does. In other words, the concrete passing of time in space is what orders the temporal sequence. A future second is always some number of seconds before it begins passing. After it has passed, it is always some number of seconds in the past, dependent on how many seconds has passed since. In sum, time is made up of an active or concrete component, “concrete time,” and an inactive or abstract component, “abstract time.” The concrete component of time is the process of time passing. The future and past times are the inputs and outputs for this process by which time flows from future to past.

Future and past times are occupied by abstract temporal objects. Present objects are concrete things located in space and the passing of time. They have, for example, a concrete shape, size, and mass. Abstract temporal objects are located in abstract time. They have the properties of abstract shape, size, and mass (more soon). There are two kinds of abstract temporal objects: indexical and complete. Indexical abstract objects are composed at minimum of an indexical and property pair, for example, [*that car's*] [redness]. These abstract objects can be thought of as abstract property instances and allow for property change. Suppose the abstract object *that car's redness* is in the future. When it becomes concrete (or present) then that car is red. Unlike indexical abstract objects, complete abstract objects do not point to concrete objects. Before the airplane was invented there were no concrete airplanes. There were abstract airplanes though in the future waiting to be concrete. In sum, indexical abstract objects allow for concrete

⁸ There is an epistemic concern with tracking seconds. We can only track seconds by tracking changes that take a second. Physical reality is such that the time a change takes depends on myriad factors. The primitivist, like primitivists in the philosophy of color (Roberts, 2018), accepts this possibility but rejects that it entails skepticism (see Sect. 5. 5 for further discussion on skepticism.)

objects to change their properties, and complete abstract objects allow for new objects to become concrete, including kinds of objects that have never existed concretely before.

What is this notion of an abstract thing to which I keep referring? Primitivism understands the abstract as the negation of the concrete. To be concrete is to be spatially connected or, more simply, to exist in space (which, as I explained, is not the same as taking up space). Hence, we can say that to be abstract is to exist but not in space. As every region of space is in space, there is no space that is not in space. Ergo, the abstract cannot exist in some other space outside of space. The time primitivist, thus, accepts that abstract things exist but do not exist anywhere. We can conclude then that, according to the view, an abstract red square is just a red square that does not exist anywhere. In sum, abstract objects exist but not anywhere, and abstract properties are just properties (e.g. red, cold, bitter, square...) that are instantiated by objects that do not exist anywhere. (A corollary is that time travel is impossible under primitivism: the past and future are abstract and so have no location that can be occupied by us.)

How can something be square (or red for that matter) and take up no space? Surely, something that is one foot squared in size must take up that much space. In reply, the time primitivist holds that those who find this consequence unintuitive do so because their intuitions are misfiring. Obviously, nothing concrete can be square and take up no space, by definition. However, the abstract does not exist anywhere. If a square object exists nowhere, then it clearly cannot take up space. So, why do our intuitions misfire? In our everyday lives, we are primarily exposed to concrete square objects, and so we form the mistaken intuition that square objects *must* take up space. This intuition, though, ignores the minority of cases. Let me explain. Melissa lives in round world (everything is round). If she dreams of a square object, intuitively she is mentally connected to squareness: she now for the first time knows what it looks like for

something to be square. Where is this square object? It is certainly not in her external world. It would also be quite unintuitive to claim that it is in her physical head or brain. The primitivist holds that it is common sense that Melissa experiences a square object that does not exist anywhere. We are mentally connected with abstract objects in dreams, hallucinations, and thoughts.

More can be said. I mentioned earlier that every region of space is in space, so every region of space is concrete. However, space itself cannot be in space, because something cannot be inside of itself. So, while every region of space is concrete, space itself is abstract: it does not exist anywhere. There are two important conclusions that should be drawn. First, there can be things (e. g. space itself) that exist but do not exist anywhere. It simply makes no sense to ask, “where is space located?” Second, something can have spatial properties even though it exists nowhere. Space is infinitely big but takes up no space. If something infinitely big can take up no space, something can be one foot squared and take up no space. Likewise, arguably, space is cold (a secondary property) but takes up no space (most of space is empty and has no nearby stars). So, arguably, something can be red and take up no space or smell bad but take up no space, etc. The primitivist is entirely comfortable with these conclusions and thinks they are intuitive.

The fact time primitivism accepts that past and future abstract objects exist means it can accept that dinosaurs exist and avoid the well-known issue presentism encounters with referring to past objects. Reference to future objects is likewise not an issue. An immediate rejoinder is to say that abstract dinosaurs are not really dinosaurs. Dinosaurs are living things that occupy space. Living is a process and processes require the passage of time. Hence, abstract dinosaurs cannot be alive. I agree that abstract dinosaurs are not alive. They are not conscious either, for consciousness is a process too. However, I disagree with the position that dinosaurs are

necessarily alive. I think it is perfectly ordinary to talk about dinosaurs even though there are no living dinosaurs, so there must be some beings we are referring to using “dinosaurs” that do not exist in space. This is the intuition that the primitivist is concerned with addressing. Remember, though, that the primitivist, like Sider’s Williamsonian passage, accepts that if there once existed dinosaurs, then there are things that were dinosaurs. So, it is not absolutely necessary that the things that were dinosaurs be dinosaurs. What is important is that primitivism allows for there to exist abstract things that were dinosaurs to make our claims about dinosaurs true.

Using abstract times to provide truth-makers for past and future statements is not new (Bourne, 2006; Crisp, 2007). Presentists have tried similar approaches. However, as I touched on earlier, there is some tension for the presentist in holding that only present things exist *and* past and future times. For example, Crisp’s attempt to meld an abstract B-series (earlier and later than relations) with presentism begets this gem: “All times are present₁, at no temporal distance from anything [all that exists is present, at the same time], though some are earlier and some are later” (2007, p. 103). The complication stems from the fact that the presentist wants to appeal to an abstract B-series but cannot say that there are objects which are temporally separated. Time primitivism holds that the past and future exist just not concretely. Concrete time is the passing of time (one second per second), but there are future times waiting to pass and very soon every passing second becomes an abstract second that has passed. This is the flow of time we live in.

Primitivism holds that past and future times are abstract and occupied by abstract objects. There are, though, abstract objects that do not exist in time. There are necessarily timeless entities like the number 2, and there are entities that contingently do not exist in time. I have already argued for why the number 2 is timeless. Abstract entities that contingently exist outside of time include the Borg from Star Trek (hopefully), as well as unicorns, and other fantasy

characters. How does the primitivist differentiate between temporal and non-temporal abstract objects? The primitivist insists that there is no reductive account. However, this does not mean that the primitivist cannot say something about what differentiates these objects. Being in time is like being in a river. The active component of time, the passing of time, is the gravity of time. It “pulls” the future towards the present and “pushes” changes in the present towards the past. Hence, we can understand temporal abstract objects as those that are affected by the passing of time. To use a metaphor, temporal abstract objects are in the gravity of time. Non-metaphorically, we can say that they, unlike non-temporal objects, have the property of being within the temporal force generated by the passing of time. Past objects have gone through the process of becoming abstract. Future objects are waiting to become concrete.

One might wonder which is more fundamental, abstract time or concrete time. By “fundamental” I mean that which explains the other thing(s). Relatedly, one might wonder, “yea, you say that dinosaurs exist according to primitivism, but surely abstract time is just something we make up, a story we tell, to help us understand the world.” My response is that neither is more fundamental when it comes to understanding time. You cannot really understand the idea of a second passing without understanding the idea of a second existing abstractly. You need to be able to think of a second that has passed in order to understand that seconds pass, but to speak of a second that has passed is to speak of an abstract second. As they are both necessary to understand time, I do not think we can claim abstract time is a story we make up, unless one wants to claim that time itself is a story we make up. I suspect that this is not plausible under any

normal sense of “story” and “make up.”⁹ Anyway, this paper will not argue against idealism. Suffice to say that time primitivism is not intended to be a kind of idealism.

Earlier, I accepted the position that abstract dinosaurs are not alive. Living is a process, and processes require the passage of time. More generally, then, we can conclude that abstract objects cannot change at all, for no time passes for them. This may seem unintuitive, as we do sometimes talk about changing the future. I will now address this. We can talk about the future in two ways: what will happen *ceteris paribus* and what will happen *simpliciter*. With regard to the former, perhaps more quotidian sense, we can change the future but by changing what would be present if things progress as they are by deciding on a different course of action. This is not changing a future object in the future but changing what choices we make in the present. Hence, the future can at most abstractly change in this *ceteris paribus* sense; all concrete changes happen in the present. That is, the future supervenes on what we, as concrete beings, decide to do in the present and has no effect on what happens.

With regard to the latter, perhaps more philosophical and less quotidian sense, we cannot change the future. However, this is not because the future dictates the present, but because this sense of “future” is not *ceteris paribus* but *simpliciter*. In other words, there is nothing special about the future *simpliciter*. It supervenes on the concrete. If it is true that I will go to the store tomorrow, then this is true because that is the decision I will make tomorrow, not because I am forced to make it by what will be true but because of what I decide to do. What is true of the future *simpliciter* is only true because of what we choose to do, and not the other way around. We will look at this in more depth later on when we examine the problem of fatalism.

⁹ Maybe a plausible course of action is to say that time is an inherent part of how the human mind understands the world. It is real to us given our ability to comprehend reality but is not independent of us. There is no reason the primitivist has to take this transcendental idealist approach to time. I am a realist.

A clarification is in order. I said that abstract things cannot change but that abstract future objects become concrete. Have I contradicted myself? The confusion comes from treating the process of becoming like ordinary causation. This is not how it works. When the abstract becomes concrete, there is no change that occurs to its intrinsic properties. The abstract becomes concrete by changing an extrinsic property.¹⁰ A corollary is that the abstractness of an abstract property of a future object is an extrinsic property of that property. Past objects can be future objects, meaning that dinosaurs can be in the past and the future (maybe we recreate them), but they cannot become future objects and so cannot become present objects. Their pastness is still extrinsic like with future abstract objects, because past objects do not intrinsically differ from future ones. The passing of time, though, necessarily goes in one direction, so there is no means by which past objects can become future or present.

4. Change

The present is the concrete stuff and the present changes, or more accurately, things in the present change. However, not everything in the present changes all of the time.¹¹ My chair is still a chair and it is still black. Thus, to start this discussion on change we must make an important distinction between being and becoming. Being, or just being concrete, is integral to how ordinary objects persist through time. Ordinary objects persist by having essential properties that are static, for example, my chair's being plastic, my table's being made of wood... These properties are not temporal, according to primitivism. Rather, their instances persist through time

¹⁰ What matters for primitivism is for properties that require the passage of time (anything that depends on a process) to be extrinsic properties. So, consciousness comes out as extrinsic on my view. Without time our neurons would not fire, and so we would have no thoughts, feelings, or perceptions.

¹¹ Even though at a micro-physical level everything is in motion (so to speak) at the macro level many properties of objects remain the same over long periods of time.

just by being concrete properties.¹² Therefore, in this way, primitivism holds that ordinary objects endure in that their static properties are wholly present. For example, when a concrete object is plastic, its plasticness is concrete; according to primitivism, this is how the static property persists. The primitivist believes this result is intuitive and common sense: To ask how much time it takes for my chair to be plastic makes no sense, but it makes sense to ask how much space my chair takes up. Therefore, ordinary concrete objects persist in space by taking up space, but they do not persist through time by taking up time.

The concrete beings change: I move my chair to get more comfortable, my hands move as they type, the sun rises... What's going on here? When something changes, it takes up time. All changes take time. The passing of time is the possibility for change. More accurately, the passing of time is an essential (or metaphysical) part of change. So, unlike being, becoming has the passing of time as an essential part. Although becoming has the passing of time as an essential part, becoming is a primitive and fundamental process that occurs in space and cannot be reduced to having different properties at different times.¹³ (To be clear, becoming must occur in space, because time only passes in space. This follows from Concreteness and the common-sense claim that the passing of every second is present.) Becoming takes future objects (whether these are indexical or complete objects) as inputs and makes them concrete essentially over some interval of time. Becoming also can “push” a concrete property or object into the abstract past. In sum, becoming is the irreducible process that things and property instances go through by which time is taken up to make the abstract concrete and the concrete abstract.

¹² My formulation of primitivism accepts universalism about properties. There is no reason for a primitivist who accepts abstract entities to reject that there are abstract properties. However, it may be possible to build a version of primitivism that is more sympathetic to nominalist intuitions. I hope someone does this work.

¹³ Consider how binary colors like orange are thought to be composed of unitary colors (in some sense), in this case the unitary colors yellow and red, but it is entirely unclear how a reduction could be made to work. Color primitivists may wish to reject any attempt to reduce binary colors to unitary ones (Roberts, 2018).

In addition to ordinary objects, there are also dynamic objects. Dynamic objects, e.g. a spinning fan, are entities whose nature is partly temporal: they have parts that are constantly in the process of becoming. Of a spinning fan, we can say it is spinning now. So, primitivism would say that the spinning of the fan is a concrete thing. Hence, we can see how becoming is a concrete process and so can be part of a concrete object: the spinning fan is attached to the fan's stand and power cord. For something to be an object it must have some static properties. For example, a spinning fan requires fan blades, a stand, certain gears, etc. Although dynamic objects take time to persist, they do not have temporal parts, according to primitivism, because *taking time is participation in the passage of time and not the having of times as parts*. (Time passes in space and dynamic properties have this passage as a metaphysical part.) To sum up, ordinary objects persist by having static essential properties that do not take time to persist (they persist by being); dynamic objects persist in part by having essential properties that take time to persist, understood as participation in the flow of time.

It is instructive for me to contrast how objects persist according to primitivism with how they persist according to eternalism. Eternalists most naturally think of time as part of space, as in space-time, and most naturally characterize things as perduring: objects have temporal parts. So, on this version, objects persist through time by taking up time in the sense of having parts of time as parts of themselves. Primitivism rejects this perdurantism entirely. Past and future times are not parts of persisting objects, because objects persist just by being concrete. Primitivism holds that to be present is to be concrete, so no further explanation is needed. Another version of eternalism holds that all properties are, in fact, relational properties with times as relata. Thus, persistence and change depend on the time-relata of the relevant relations. Primitivism also rejects the relational view and for the same reason. I said above that dynamic objects have the

passing of time as an essential part, but it is important *not* to confuse the “passing of time” with “times.” Primitivism (see Sect. 2) holds that no time is present even though the passing of time is necessarily present.

How can becoming interact with dynamic objects if dynamic objects cannot exist in the past and future (remember that processes require the passage of time, which only occurs in space). Indexical abstract objects can have dynamic properties, because these are not properties of an abstract object *per se* but properties a concrete object will or used to have. It is true that complete abstract objects cannot have dynamic properties, but dynamic properties supervene on intrinsic properties in space (when a fan is spinning this is because of its physical structural properties like having a motor plugged into the electrical grid). Thus, we can talk of the dynamic properties an abstract object would have if it were concrete (and plugged in or charged up or put in a relevant place): for example, if an abstract solar fan became concrete it would spin in the sun. Ergo, primitivism and abstract time provide enough tools for becoming to deal with dynamic objects.

Why can becoming not be reduced to being? According to primitivism, it cannot be reduced because the reduction fails. Assume that x changing its property R to G is identical to x having R at t^1 and x having G at t^2 . Although such an analysis is widely accepted, it is not, in fact, a successful reduction according to the primitivist. The reason is that the concept of becoming is, in fact, hidden in the analysis, as can be demonstrated by considering the following question: How does t^1 change to t^2 ? This change cannot, reductively, be analyzed by referring to times, because it is the change in times itself that requires analysis. In other words, time itself is always

in the process of becoming and so becoming cannot be analyzed in terms of time. It is the failure of this reduction that perhaps most strongly militates against time being a dimension.¹⁴

5. Why believe primitivism?

In the introduction, I mentioned how presentism, eternalism, and growing block (GB) struggle to explain the flow of time, and that I thought primitivism could. I think that perhaps the strongest reason to endorse primitivism is that it intuitively accounts for the flow of time, whereas the mainstream views struggle. I raised two quick objections against mainstream views in the introduction, one against presentism/GB and one against eternalism/GB:

Presentism/GB objection: If the past and/or future do not exist, how do we get from one second to the next? (For a second to pass, it must come from and go somewhere.)

Eternalism/GB objection: If the past and/or future exist, then why is today the present and not yesterday? (For today to be present, there must be something special about it.)

Obviously, proponents of these views have a lot they could say in response. I cannot in this paper address these responses. What I will do instead is to show that primitivism is such that these arguments do not apply to it. There is no concern about how we get from one second to the next. Primitivism does not reject the existence of future seconds and past seconds, and primitivism accepts that there is a primitive process of becoming. Time is by its nature always becoming. So, there is no amount of time that is ever present: no matter how small of an amount of time you

¹⁴ What about using causation to explain change? That is fine, as long as one notices that the causal “then” has the concept of becoming built into it. So, no analysis of becoming can be given using causation.

choose that time is passing and so is not concrete. There is no issue with why today is present and not yesterday, because primitivism endorses a metaphysical distinction between the present and the past and future: the present is concrete and the past and future are abstract. There is, thus, no issue with why we are not conscious *in* yesterday. Abstract objects cannot be conscious, for they are not in the passing of time. Time only passes in space, so there is no time for abstract objects for any mental activity to take place. Further, primitivism can explain how we got to today and how yesterday is now in the past: there is a fundamental, concrete process of becoming (the passing of time) that takes place in space, whereby abstract future times pass to become abstract past times.

One might wonder can Williamsonian Passage (WP) or the moving spotlight theory (MS) compete with primitivism in explaining the flow of time? These theories are obviously better thought out than the basic versions of the dominant theories dealt with above, and they admittedly have some similarities with primitivism. However, I do not think these views can intuitively explain the flow of time. WP runs into the same basic issue as presentism. The past and future do not exist, so there is no *when* for seconds to come from or go to. MS says that there is some instant of time that is absolutely, non-relatively present, and that this instant of time changes due to the fact that the property of presentness changes the times that instantiate it. The problem here is that between any two times A and B there are infinite time instants, so there is no way for any change in what is present to occur.¹⁵ Notice that primitivism does not have this problem. To be present is not to be at some time but to be a kind of thing: a concrete thing.

¹⁵ Sullivan's minimal A-theory seems to run into a similar problem. She (2011, p. 167) says, "One and only one region of spacetime has a special, complex temporary property—it is the only region that figures in any (untensed) location relations." In reply, if what is fundamental is space-time as described by four dimensions, every region of space-time is a region of time (you cannot be in space-time without being in time). This implies that the present is an amount of time. Primitivism holds that this is a category mistake. Time is infinitely divisible, so if the present is a time, the present cannot change: there are infinite points on the time dimension between any two times that the present would have to move through.

There are other reasons why one might endorse primitivism. I touched on other concerns the primitivist has with the competing views, for example, the related concern with presentism regarding referring to past and future entities and the concern with eternalism regarding how the view most naturally holds that to persist through time requires taking up time. Another reason to believe time primitivism is that the view intuitively deals with issues in the philosophy of time. I have already touched on some of these issues. However, I will now examine how primitivism answers a series of seven long-standing temporal puzzles intuitively. Some of these puzzles have already been indirectly addressed, but I will now look at them in more depth.

5.1. How thick is the present?

Any view that thinks of time as a dimension and understands the world fundamentally using the B series is going to struggle to provide an intuitive answer to this question. If the present is infinitely thin, does that mean we *always* see into the past, because light takes time to travel? If it has some thickness, what is it? Would not any number be ad hoc? The B theorist may say that how thick the present is depends on the context: the present is a year if we are talking about a year and a day if we are talking about a day. This answer, though, is too fast. 2024 is the year that is currently passing, but there are parts of it that have not yet happened and parts of it that have already happened. Hence, it cannot be that the entire of 2024 is present. At best only part of it is, but which part: a day, an hour, a minute, a second? The primitivist avoids these issues entirely by rejecting the fundamentality of the B series and understanding the present not as a place on the time dimension but as a metaphysical kind of stuff: the concrete. As I explained, this

means that to be present is to be in space.¹⁶ Hence, it follows from primitivism that the present is not a place on the time dimension and has no temporal duration. Ergo, the question, the primitivist says, is ill-conceived. The present is not an amount of time.

5.2. *What is simultaneity*

Einstein held that two things occur at the same time iff their light reaches a mid-point at the same time, leading to his relativism about time (Einstein, 1961, p. 26). Side-stepping the question of whether relativity is true, almost everyone accepts that it is not intuitive or common sense. We think of time as an objective phenomenon independent of reference frame. Primitivism gives a simple and intuitive answer that has nothing to do with light being a constant. For two things to be simultaneous is for them to be spatially related (e.g., a line could be drawn between them) or for them to have been spatially related, if we are talking about a past event. If I pass or passed the finish line at the same time as someone else, then this means we are or were both parallel in space at the location of the finish line. This definition means that simultaneity is not relative to a body of reference (e.g. light may get to the mid-point on the moving train faster than on the embankment but that is irrelevant to whether the events happened at the same time).¹⁷

The apparent incompatibility between primitivism and relativity will be seen by some as a reason to reject the view. However, primitivism is not the only metaphysical theory of time to have an apparent incompatibility with relativity: presentism is also thought to be in tension with

¹⁶ Primitivism is compatible with saying that when looking at stars we see the stars as they used to be, because the light takes so long to reach us that the local situation may have changed. However, this does not imply that the local situation had to change. It is possible that you are seeing the star as it is now.

¹⁷ In more detail, imagine two points A and B and a mid-point M on the embankment and M' on the train. On the embankment at M, events at A and B are seen as occurring at the same time, because the light gets to M from A and B simultaneously. However, as the train is moving towards B, at M' the light from B is seen first, so A and B are not simultaneous from the train's reference point. The primitivist rejects this definition, which Einstein admits is a stipulation (p. 27). The primitivist asserts that all that matters is whether the event at A and the event at B were spatially related or are spatially related. This will not always be possible to determine and that is okay.

relativity. Hawley (2006) discusses two strategies for responding to this problem. The first strategy is “undermining” and involves arguing that scientific metaphysics makes no empirical predictions. The second strategy is “counterargument” and involves arguing that metaphysical argument can give reason to reject a scientific theory. For further discussion of the first strategy see Craig (2001), Markosian (2004), and Zimmerman (2011). For further discussion of the second strategy see Tooley (1997), Crisp (2008), and Monton (2006). Thus, there are responses available to the primitivist for dealing with the apparent incompatibility. I will not in this paper, however, further investigate this issue. It is a separate issue for a different time.

5.3. McTaggart’s paradox

McTaggart (1908) distinguishes between two types of properties for ordering temporal events: A properties and B properties. A properties are, for example, being two days future, being present, being past, being five days past... B properties are for example being two days earlier than x date, being 3 days later than x date, being simultaneous with... McTaggart argues that the A properties cannot be real because they are contradictory: Every moment in time must have every A property, because eventually every moment in time goes from future, to present, to past. In other words, if you were to label the moments of time, you would have to label every moment past, present, and future, because every moment at some time has those properties.

The primitivist easily avoids this paradox. According to the view, past and future moments of time are not part of the same reality as the present: the past and future are abstract and do not exist anywhere, while to be present is to exist in space and so have a location. There is a fundamental process of becoming in space by which each future second passes and becomes a past second. The flow of time, for the primitivist, is due to this process. The B properties

depend on this fundamental process. So, there is no fundamental time series that exists “outside” time that has moments that must be labeled timelessly.

5.4. Fatalism

If we accept bivalence, propositions about the future seem to result in a paradox suggesting that all our future actions are fated in advance. I understand fatalism here not as the view that the future is fixed, which I accept, but as the view that the future is determined in advance (so that we cannot do otherwise). Here is how the argument goes (Emery et al, 2020):

P1. There exist now true propositions about everything that will happen in the future.

P2. Every proposition is either true or false (bivalence).

P3. If there exists now a set of true propositions about everything that will happen in the future, then everything that will happen is fated to happen.

C1. There exists now a set of true propositions about everything that will happen in the future. (From P1 and P2)

C2. Everything that will happen is fated to happen. (From 3 and C1)

The primitivist avoids this argument by rejecting P1. No proposition exists now, because propositions are not concrete things. The primitivist holds that P1 must be replaced by the following instead:

P1*. There exist true propositions about everything that will happen in the future.

Thus, the argument would require P3 to be replaced by a similarly modified premise.

P3*. If there exists a set of true propositions about everything that will happen in the future, then everything that will happen is fated to happen.

Unfortunately, unlike P3, P3* is clearly false. With P3, as the propositions exist now, it may seem that they can determine what happens later. However, propositions, according to the primitivist, exist “outside” of time, hence they cannot determine what happens later. It can be true that I will go to the store tomorrow, because that is what I will end up doing of my own volition. It cannot be that I am fated to go to the store because I chose to. The proposition can be true even though I have not yet decided to go to the store, because the proposition is not in time.¹⁸ The primitivist thus can accept bivalence and reject fatalism. This is a positive for the view, because, intuitively, our futures are not determined in advance and bivalence is true.

5.5. Can the entire universe freeze?

As the primitivist accepts that the passing of time is concrete, he is a substantivalist about time. This means he accepts that everything in the universe could freeze for a thousand years, so that possibly a thousand years has passed between your starting and finishing this sentence. The primitivist accepts this outcome. Primitivism generally has these kinds of consequences. For example, color primitivism separates the colors from reflectance properties, so that possibly nothing has the color it appears to have. Primitivism can insist that metaphysically this is impossible because although colors are not reflectances, they are metaphysically linked.

Likewise, the primitivist could say that metaphysically, for whatever reason, the entire universe

¹⁸ Abstract things can be in abstract time, but propositions are not entities that were or will be. Of course, the truth-value of a proposition can change over time, but the propositions themselves are never concrete things in space (they do not exist anywhere in space or everywhere). Hence, propositions can refer to times but are never in time.

cannot just freeze. However, I think a better solution would be to say that the present concern is not different in kind from standard skeptical scenarios to which there are myriad responses.

Presumably, the primary reason people do not like the idea of everything freezing is due to the skepticism that arises. If everything could freeze, a thousand years could have just passed without us noticing, so we do not have epistemic access to time's passage. This kind of concern is exactly like other external world skepticism concerns. If my entire conscious life could be reproduced via electrical stimulation to my brain in a vat, I could be a brain in a vat right now without any indication, so I have no way of knowing whether I am brain in a vat. What the primitivist should do is to simply reject such skeptical arguments. My personal favorite reply to skepticism is Vogel's (1990): We know skeptical scenarios do not actually obtain via an inference to the best explanation. Skeptical scenarios propose extra mechanisms that are unnecessary. For example, to postulate universe wide freezes would be to postulate an additional law for which we have no evidence. For those who dislike Vogel's response there are others available (Dretske, 1981; Nozick, 1981; Goldman, 1979; Heller, 1999; Lewis, 1996).

5. 6. How fast does time pass?

The conceptual framework that gives rise to this question is eternalist. If we think of time as a dimension that stretches from the past to the future, we can ask how fast the present moves along that line. Once we think this way, any answer seems ad hoc. We might then wonder why time need pass at one second per second. However, once this eternalist framework is thrown out, the conceptually confused question no longer arises. The passing of time is a concrete process that is required for change. A second is a certain amount of time. To ask "how fast does time pass" is to ask how long a second is. Well, obviously, a second is a second, and this is by definition. So,

once the confused framework is thrown out, the question “How fast does time pass?” can be seen as having a totally trivial answer.

5.7. *The topology of time*

Did time have a beginning? Will it end? Time itself is timeless like space is spaceless. That is, like how space itself takes up no space, time itself takes up no time. The question, “How long does it take a second to pass?” does have an answer, one second, but, as mentioned, this is just to give the definition of a second. Seconds do not take up seconds in the way that running, painting, and sleeping take up seconds. Similarly, a meter squared of space *can* be said to take up one meter squared, but this is just to state the definition of “a meter squared of space.” To ask whether something has a beginning or end requires that, in principle, it can be measured in some unit of measurement, but as shown, when we say that “a second takes a second” or “a meter squared takes up a meter squared” we are not giving a measurement but a definition.¹⁹ In other words, to answer whether time had a beginning we would have to, in principle, be able to measure an amount of time, but this is impossible: there is no unit by which to measure an amount of time; we can only state a definition for what that amount of time is.

One may reply, “can we not ask what is the total amount of time?” You can ask what the total amount of time something took is, but to ask this about time itself does not make sense. The use of “total” implies that there must be a beginning and end. If there were a beginning and end, then you could measure the length of time. You would be measuring the amount of time that time took. To do this would require that time takes time, which would require higher order times.

¹⁹ An easy way to tell is that the answer is a priori and requires no empirical work like measuring would.

Whatever higher order times would be they would be times too, so an infinite regress begins that starts with the question, “What is the total amount of higher order time?” Of course, the primitivist denies that there are higher order times. As I said, it makes no sense to talk of time taking up time nor space taking up space. Time is timeless and space is spaceless.²⁰

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²⁰ I can no longer remember where but I would not be surprised if some of these ideas came from P.M.S. Hacker and/or Wittgenstein. I am more than happy to give credit to whomever deserves it.

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