A Modal Condition for the Beginning of the Universe

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Abstract

This paper considers two problems – one in philosophy of religion and another in philosophy of physics – and shows that the two problems have one solution. Some Christian philosophers have endorsed the views that (i) there was a first finitely long period of time, (ii) God is in time, and yet (iii) God did not have a beginning. If there was a first finitely long period of time and God is in time then there was a first finitely long period of time in God's life. But if God's life includes a first finitely long period of time, then, on one initially intuitive conception of beginning to exist, God began to exist. Thus, at first glance, (i)-(iii) are not mutually compatible. Meanwhile, on a variety of proposals for quantum gravity theories or interpretations of quantum theory, space-time is not fundamental to physical reality and instead can (somehow) be explained in terms of yet more fundamental physical substructures. As I show, there is a strong intuition that if space-time is not fundamental to physical reality, then, even if there were a first finitely long period in the life of physical reality, physical reality would be beginningless. Thus, both theistic philosophers and philosophers of physics have developed theories on which some beginningless entities have a first finitely long temporal period in their lives and so both groups should be interested in developing criteria that distinguish such entities from entities with a beginning. In this paper, I offer one necessary (but not sufficient) condition, namely, that entities that begin to exist are absent from the closest possible worlds without time. The view that I defend has one significant upshot: no sound argument can use the mere fact (if it is a fact) that past time is finite to reach the conclusion that the totality of physical reality had a beginning.

1 Introduction

At first glance, theologians and philosophers of physics are unlikely bedfellows. Nonetheless, both theologians and philosophers of physics are interested in understanding the claim that the whole of physical reality, herein, the *Cosmos*, began to exist. For theologians, the claim that the Cosmos began to exist should be contrasted with the claim that God did not begin to exist. Some analytic theologians and philosophers of religion have defended

the view that while there is a first finitely long period of time in God's life, God's life was beginningless (Craig [2001a], Erasmus [2021], Loke [2017]). This view is conceptually problematic because, prima facie, to begin to exist just means that one's life included a finitely long initial period of time. On the other hand, as discussed below, a variety of contemporary physical theories and research programs are committed to the claim that the Cosmos is not fundamentally spatiotemporal (Bohm [1980], Earman [2002], Healey [2002], Huggett and Wüthrich [2013], Huggett and Wüthrich [2018], Huggett [2022], Barbour [1999, 1994], Butterfield and Isham [2006], Bihan [2017a,b, 2019, 2020], Oriti [2014, 2020, 2021], Wilson [2021], Healey [2021], Rovelli [2020], Carroll [Forthcoming, 2019], Carroll and Singh [2019]).[1] If the Cosmos is not fundamentally spatiotemporal, then, even if there were an initial finitely long period of time in the life of the Cosmos, the Cosmos would be fundamentally beginningless. Thus, both theologians and philosophers of physics are interested in theories according to which there was an initial, finitely long period of time in the life of some x, even though x is beginningless.

Consequently, both theologians and philosophers of physics should be interested in developing necessary criteria for beginning to exist that distinguish beginningless entities whose lives include an initial finite period from entities that did begin to exist. In

[1] Throughout this article, I make use of the notion of *fundamentality*. For example, I will examine theological theories according to which there is a fundamental aspect of God that is non-temporal and I will examine speculative physical theories according to which there is a fundamental aspect of physical reality that is non-spatio-temporal, or at least non-temporal. I do not provide an account of fundamentality here – in part because providing a conceptual analysis of fundamentality turns out to be non-trivial – but I will provide the reader with some intuition pumps for thinking about what I mean when I say that A is a fundamental aspect of some entity E. To say that A is a fundamental aspect of some entity E means that, at the level of metaphysical explanation, A is a non-derivative aspect of E; while there are other aspects of E whose explanation is in terms of A, A does not have a further and more basic explanation in terms of other aspects of E. We can identify a set of formal properties obeyed by the fundamentality relation. The fundamentality relation is transitive, i.e., if x is fundamental to y and y is fundamental to z, then x is fundamental to z. Fundamantality is irreflexive, i.e., nothing is fundamental to itself. And fundamentality is asymmetric, i.e., if x is fundamental to y, then y is not fundamental to x.

One way that A could be fundamental to E would be if A is the reductive base for E. For example, H_2O molecules are fundamental to water. However, fundamentality is more general than the relation of *being-a-reductive-base-for* since (for example) God is not reducible to God's fundamental aspect(s), but God's less fundamental aspects are explained in terms of God's more fundamental aspects. As another example, the relation of *being-functionally-realized-by* is another example of fundamentality, so that (for example) if mental states are functionally realized by, but not reducible to, neuronal states, then neuronal states are fundamental to mental states.

this paper, I defend a necessary, but not sufficient, condition for beginning to exist that distinguishes the two classes of entities. According to the Modal Condition, the Cosmos had a beginning only if at all of the closest possible (or counterpossible) worlds where time does not exist, the Cosmos does not exist. To articulate the Modal Condition, I begin by discussing a theological debate concerning God's relationship to time and I develop the Modal Condition using the Lewis-Stalnaker semantics for counterfactual conditionals. Although I am not myself a theist, the theological reflections contained in this paper were useful for thinking through a novel necessary condition for the beginning of existence; for that reason, I invite naturalists to read through the theological sections of this paper with an open mind. After developing the Modal Condition in the theological context, I turn to a discussion of the Modal Condition in philosophy of physics. One upshot of this paper is that, despite frequent claims to the contrary, establishing that physical reality has a finite past is not sufficient for establishing that physical reality had a beginning.

2 The Metaphysics of Time

Before turning to either the theological or philosophy of physics problems addressed by this paper, let's turn first to a brief survey of the various metaphysical accounts of the nature of time. We can distinguish three families of theories: *A*-, *B*-, and *C*-theory. According to *A*-theory, time passes and the present is the distinguished temporal location where time passes. Following a convention from the physics literature, unless I note otherwise, in this paper, by *event*, I will denote a definite spatiotemporal location and perhaps that location's contents. On *A*-theory, events are either absolutely past, present, or future, where 'past', 'present', and 'future' are understood as monadic predicates. According to *B*-theory, time does not pass, no events are absolutely past, present, or future, but any given event is related to any other event as being either before, after, or simultaneous. 'Before', 'after', and 'simultaneous' are understood as binary relations. According to *C*-theory, time does not pass, no events are absolutely past, present, or

future, and there are no asymmetric (temporal) relations between events. In particular, if *C*-theory is true, then no event is before or after any other event; instead, each event can be described as being between (at least) two other events. Betweenness is understood as a trinary relation. Most (perhaps all) proponents of the two theological views on God's relationship to time that I subsequently discuss in this paper (i.e., the Oxford School and Craig's Creation Hypothesis, as defined in the next section) endorse *A*-theory.[2] For that reason, the majority of my discussion of theological views will be couched in *A*-theoretic terms. *B*- and *C*-theory enjoy more popularity among philosophers of physics, so my subsequent discussion of various views in philosophy of physics will not be couched in *A*-theoretic terms.[3]

Lastly, note that, while I do not claim the standard Minkowskian interpretation of relativity is incompatible with *B*− or *C*−theory, the Minkowskian interpretation postulates a formal structure for space-time distinct from the formal structure *traditionally* postulated by *A*−, *B*-, or *C*−theories. (Of course, sophisticated *non-traditional B*− and *C*−theories, inspired by relativity, have been constructed.) The alleged incompatibility between *A*−theory and the Minkowskian interpretation is well-known in the literature and I will not belabor the point here. Less often discussed is the tension between, on the one hand, the version of *B*− or *C*−theory presented in undergraduate metaphysics textbooks, e.g., [Loux, 1998, 213], or historically by John McTaggart, and, on the other hand, the Minkowskian interpretation, though see Earman [2002].

Consider that Michael Loux (1998, 213), in his metaphysics textbook, describes *B*-theory as entailing that "time is a dimension along with the three spatial dimensions; it is just another dimension in which things are spread out." Philosophers of physics will recognize that the view described by Loux most closely matches Newtonian space-time,

[2]This may reflect a more general trend among philosophers of religion. According to the 2020 Phil Papers Survey, 40.4% of philosophers of religion accept or lean toward *A*-theory while 21.3% accept or lean toward *B*-theory. The survey did not ask about *C*-theory.

[3]The situation in philosophy of physics is the reverse of the situation in philosophy of religion. According to the 2020 Phil Papers survey, 49.2% of philosophers of physical science accept or lean toward *B*-theory while 11.5% accept or lean toward *A*-theory.

that is, the view that space-time consists of a series of three dimensional spaces located at successive times, and does not match the Minkowskian view in two important respects. First, on $B-$theory as described by Loux, time is an additional dimension to our familiar three spatial dimensions. Minkowski (1952, 75) argued that, in relativity, both space and time disappear as independent existences, so that we are left with a kind of union of the two that is neither spatial nor temporal. Second, to the extent that a time parameter appears in orthodox relativity, time is measured along trajectories (i.e., the so-called *proper time*) traversing space-time and not as a global parameter. On the Minkowskian interpretation, if event α is absolutely simultaneous with event β, then α must be co-located in space-time with β, so that there are no non-trivial simultaneity relations between non-overlapping events. To put the point another way, on the Minkowskian interpretation, no event α is simultaneous with event β unless α and β occupy numerically one space-time point. For the sake of simplicity, most (though not all) of my discussion in this paper will ignore both complications and assume that we can sensibly use a single time variable.[4]

3 The Theological Problem

3.1 A survey of views on God's relationship to time

As I explained in the introduction, this paper is concerned with two problems that have a common solution: one problem in philosophy of religion and another problem in philosophy of physics. In order to explicate the problem in philosophy of religion, I need to first explicate how, assuming that God exists, God might be thought to relate to time. There are three views about how God might be related to time (Padgett [2013], Ganssle [n.d.], Deng [2018], Leftow [2005]). First, as defended by most classical theologians, God

[4]I stress that this is for the sake of simplicity only. Though controversial, I think one of the plausible lessons of contemporary physical theory is that space-time does not have the formal structure metaphysicians originally postulated when they reflected on the manifest image of time. While there are specific solutions of the Einstein Field Equation that do allow one to construct a global time variable, a global time variable cannot be constructed for arbitrary space-times. Instead of thinking of time as a global variable, the Minkowskian interpretation relativizes time to each time-like curve.

might be absolutely timeless, in the sense that God's life does not begin or end and God is not subject to temporal succession. Proponents of the absolutely timeless God sometimes say that God inhabits a timeless present that never passes into or out of either being or God's experience. This is contrasted with temporal entities, which experience successive presents. Second, God might be temporal but everlasting (or sempiternal), in which case God's life is subject to temporal succession but extends infinitely into the past and infinitely into the future.[5] Third, there is a family of hybrid views according to which God is in some sense timeless and in some sense temporal. I will refer to theories maintaining that God is in some sense timeless and in some sense temporal as *hybrid views*.

The family of hybrid views can be further subdivided in at least two ways. First, there there is the so-called *Oxford School* (Swinburne [1996], Padgett [2013, 2010, 2001a, 2000, 1991, 1989], Mullins [2020, 2016, 2014], DeWeese [2016]). According to the Oxford School, time did not begin with the Cosmos. However, the Oxford School distinguishes between two distinct kinds of time: *physical time* and *metaphysical time*. Physical time is time as described by and measured within the physical sciences. Since physical time is time as described by and measured within the physical sciences, physical time could not exist without physical entities. According to the Oxford School, absent the laws of physics, there would be no fact about the ratio in duration between two non-overlapping intervals of time, so that, without the Cosmos, there would be no fact about the duration of any given temporal interval. That is, according to the Oxford School, without the physical universe, time is *amorphous*.

The Oxford School can, itself, be subdivided into two groups: first, a group I will call the *Oxford Identificationists*, who maintain that time is numerically identical with an attribute of God, and a group I will call the *Oxford Creationists*, who maintain that time is not numerically identical with God but was created by God. Oxford Creationists argue that God transcends time because, on their view, God serves as the ground of time, God

[5] A history of the first two views in ancient and medieval philosophy, and their relationship to contemporary philosophy, is provided in Kukkonen [2015].

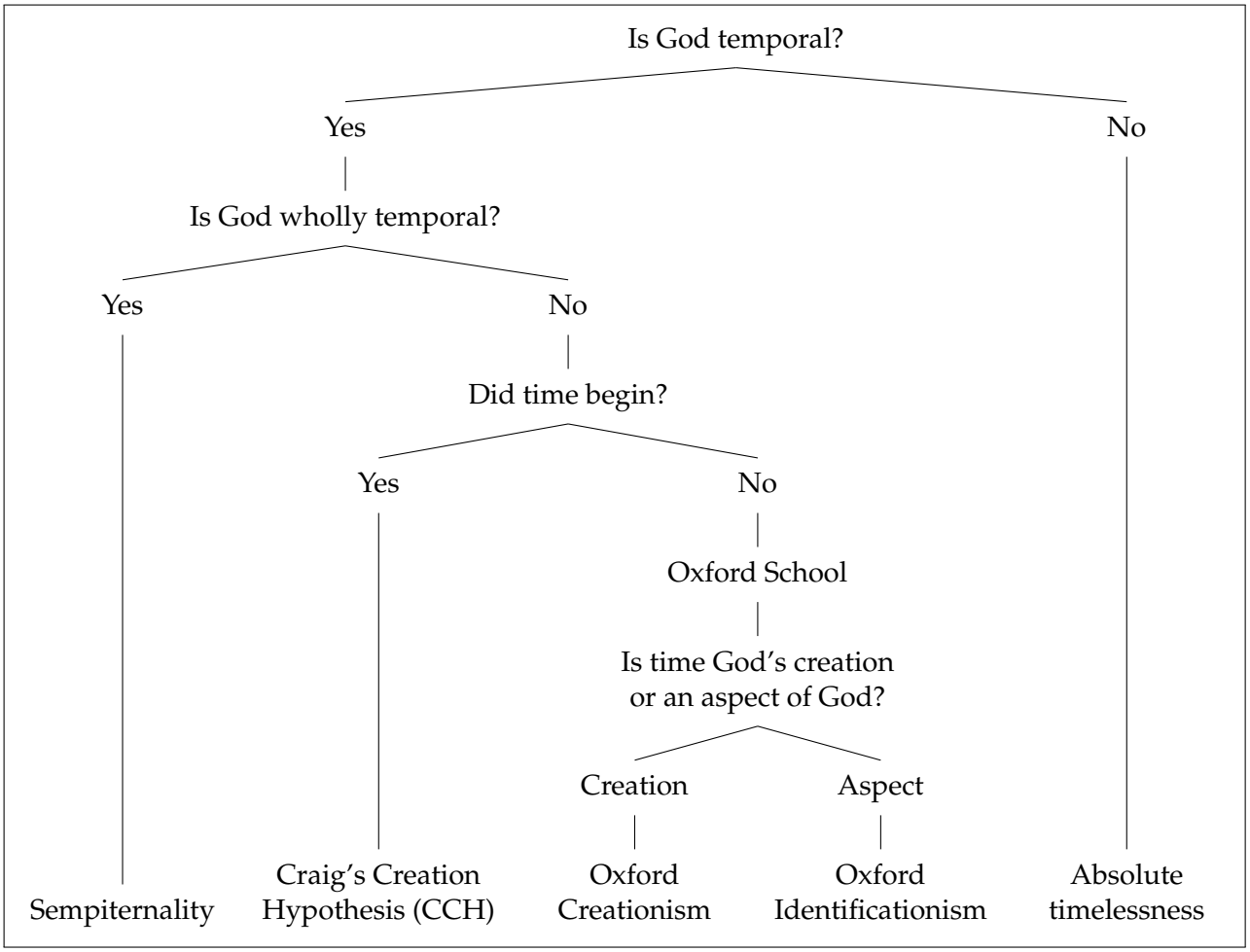

Figure 1: The most popular proposals in analytic theology concerning how God might be related to time.

is unchanged by time, God has full control over the course of history, and God's aseity demands that God be understood as prior in the order of being to the existence of time. As Padgett describes the view, God is "relatively timeless", in that, while God is subject to change in God's non-essential characteristics, God's life is not measured by time and is not affected or contained by time [Padgett, 2000, 126].

Recall that I said there were two versions of the hybrid view. So far, we've discussed one version of the hybrid view – the Oxford School – as well as two subgroups within the Oxford School – i.e., the Oxford Identificationists and the Oxford Creationists. The second version of the hybrid view is a perspective championed by William Lane Craig according to which God is timeless sans Creation and temporal with Creation (see, for example, [Craig, 2001a, 270-275], Erasmus [2021], and chapter 6 in Loke [2017]).[6] In this paper, I adopt Jacobus Erasmus's name for that perspective, i.e., *Craig's Creation Hypothesis* or CCH [Erasmus, 2021, 197]. Unlike the Oxford School, CCH involves the claim that time did begin with Creation. But, like the Oxford Creationists, CCH proponents affirm that God is prior in the order of being to time, that God transcends time, and that God is causally responsible for time. Importantly, according to CCH proponents, God somehow became temporal in virtue of having created time. As CCH proponents ordinarily explicate their view, the actual world includes a state of affairs in which God, alone, exists and, in that state of affairs, God is timeless. On the view of time endorsed by CCH proponents, change suffices for the existence of time. In the timeless state of affairs, God initiated the first change and, in doing so, brought time into being. The timeless state of affairs, qua timeless, cannot temporally precede the Cosmos; nonetheless, according to CCH proponents, the timeless state of affairs *causally* preceded both time and the Cosmos.

[6] Another hybrid view has sometimes been suggested that draws on the distinction Gregory Palamas drew between the divine essence (or nature) and the divine energies. A Palamite theologian might say that while the divine essence (or nature) is timeless, the divine energies are temporal. See, for example, [Dumsday, 2021, 37]. I will set this view aside for the purposes of this paper, in part because the resulting hybrid view has not – as far as I have been able to find – been well developed in the analytic theology literature and in part because I am not sufficiently familiar with the view to competently comment on it. Readers who think that the Palamite view resolves the theological problems that I raise better than the views that I consider can interpret this paper as articulating the destination of theological views alternative to their own.

Moreover, by initiating the first change, God initiated the beginning of time. One of my goals in this paper is to offer a better articulation of CCH than has previously been offered; to do so, I will, in some places, make use of arguments presented by the Oxford School and particularly by Oxford Creationists.

I will ultimately argue that the version of CCH previously offered is incoherent. In particular, as I will argue, the view that the actual world contains a state of affairs in which God is timeless as well as a state of affairs in which God is temporal is problematic. However, my aims are not completely destructive; I want to offer CCH proponents an alternative version of CCH that I think is coherent. To that end, I will offer an alternative version of CCH that does not include the thesis that the actual world includes a state of affairs in which God is timeless. For my purposes, I will consider any view to be a version of CCH if, according to that view, (i) God is atemporal sans Creation and temporal with Creation and (ii) God is prior in the order of being to time, that God transcends time, and that God is causally responsible for time.

3.2 Theological accounts of the beginning of the Cosmos

Having surveyed the various ways that God has been proposed to relate to time, I turn next to how CCH proponents have thought about the notion that the Cosmos had a beginning. The Oxford School and CCH proponents differ in a variety of ways. For example, Oxford School proponents say that a duration of beginningless, amorphous time temporally preceded God's creation of the Cosmos whereas CCH proponents say that a state of affairs in which God, alone, exists and exists timelessly causally, but not temporally, precedes the Cosmos. Nonetheless, both the Oxford School and CCH proponents agree on three theses: (i) God is actually temporal, (ii) time is wholly explicable in terms of God, and (iii) while God did not begin to exist, the Cosmos did begin to exist. While the Oxford School and CCH proponents do disagree about why time is wholly explicable in

terms of God,[7] let's put that difference to one side. I am interested in how the Oxford School and CCH proponents might explicate the notion that while God did not begin to exist, the Cosmos did begin to exist. One is tempted to say that:

> Beginning-to-exist-1 :=$_{def}$ x began to exist just in case x is temporal and there was some finite period of time such that there were no previous finitely long periods of time during which x existed.

If so, then:

1. The Cosmos began to exist just in case the Cosmos is temporal and there was a finitely long period of time T such that the Cosmos did not exist before T and
2. If God is actually temporal and God did not begin to exist, then there is no initial finitely long period of time in God's life.

However, this account is incompatible with CCH. CCH proponents are committed to the claims that:

3. God is actually, but not necessarily, temporal,
4. There was a first finitely long period of time, and
5. God did not begin to exist.

2, 3, 5 entail there is no initial finitely long period of time, that is, the falsehood of 4. To see this, note that the conjunction of 3 and 5 is the antecedent to 2. So, if 2, 3, 5 are true, then the consequent of 2 is true – i.e., there is no initial finitely long period of time in God's life. And now note that if God's life does not include a first finitely long period of time, then one can easily prove that time does not include a first finitely long period and so that 5 is false.

[7] The Oxford School is committed to the view that time is wholly explicable in terms of God either because time is an aspect of God (the Oxford Identificationists) or because God created time (the Oxford Creationists), whereas, for CCH proponents, God initiated the first change and the existence of change suffices for the existence of time.

How would that proof go? Suppose both that God's life does not include a first finitely long period of time and that time does include a first finitely long period. In the present dialectical context, we may suppose that, for every time that there has ever been, God existed during that time. So, God existed during the first finitely long period of time. In virtue of being the first finitely long period of time, there were no previous periods of time and so God's life could not include temporally prior periods of time. Thus, God's life would includes a first finitely long period of time. This contradicts our original supposition; by de Morgan's rule, we have that either God's life includes a first finitely long period of time or time does not include a first finitely long period. And this disjunction is logically equivalent to: if God's life does not include a first finitely long period of time then time does not include a first finitely long period.

Therefore, statements 3-5 are jointly inconsistent with Beginning-to-exist-1.[8] The Oxford School avoids this problem because the Oxford School rejects 4; for the Oxford School, the Cosmos was preceded by amorphous time, so that time lacks a first finitely long period. Thus, one tempting way to resolve this difficulty would be to simply affirm the Oxford School – or perhaps some other view of God – and reject CCH as incoherent. Let's forego the option of rejecting CCH in order to further investigate CCH.

To reiterate the incompatibility between CCH and Beginning-to-exist-1, suppose that Beginning-to-exist-1 is true. In that case, if God entered time in virtue of God's creation of time, as CCH proponents allege, then God's life includes a first finitely long period of time. If God's life did include a first finitely long period of time, then Beginning-to-exist-1 entails that God began to exist. CCH proponents want to avoid the conclusion that God began to exist; therefore, they need to identify a plausible alternative to Beginning-to-exist-1. Here is one alternative Craig has considered:

[8] An anonymous reviewer asked whether this problem can be resolved by compartmentalizing the first finitely long period of time in God's life to God's temporal life. Note that the problem under discussion concerns whether having a first finitely long period of time in the life of x suffices for showing that x began to exist; if the reviewer is correct that God did not begin to exist because we can compartmentalize the first finitely long period of time in God's life to God's temporal life, then that x has a first finitely long period of time in its life does not suffice for showing that x began to exist. That is, if the reviewer's suggestion is correct, then beginning-to-exist-1 is incorrect.

> Beginning-to-exist-2 :=$_{def}$ x begins to exist at t just in case "x exists at t; there is no time immediately *prior* to t at which x exists; and the actual world contains no state of affairs involving x's timeless existence" (as quoted in [Morriston, 2000, 155]).

Beginning-to-exist-2 does not seem to be adequate for Craig's purposes and Craig has since abandoned it (Craig [2002]).[9] Though Craig has abandoned Beginning-to-exist-2, Christopher Bobier's arguments against Beginning-to-exist-2 are instructive for articulating an adequate notion of beginning to exist.

Beginning-to-exist-2 consists of three conditions. Let's focus on the third condition, that is, that there is no actual state of affairs involving x's timeless existence. According to Bobier, the notion that there is no actual state of affairs involving x's timeless existence can be analyzed two ways. On the first analysis, the notion that there is no actual state of affairs involving x's timeless existence means that "[t]he actual world contains no *possible* state of affairs involving x's timeless existence" (emphasis is Bobier's; see his 2013, 597). Bobier argues that Craig cannot mean that x began to exist only if the actual world contains no possible state of affairs involving x's timeless existence. Bobier thinks that a timeless basketball is metaphysically possible. If a timeless basketball is metaphysically possible, then there is a possible state of affairs involving a basketball's timeless existence. So, the first option would entail that basketballs do not begin to exist and surely Craig does not think that basketballs are beginningless. I do not agree with Bobier that timeless basketballs are possible, though I grant Bobier's point; the *mere* possibility that x timelessly exists does not entail that x did not actually begin.

On the second analysis, the notion that there is no actual state of affairs involving x's timeless existence means that a state of affairs involving x's timeless existence does not obtain in the actual world [Bobier, 2013, 597]. This analysis will not fit Craig's purposes either. As I've discussed, on Craig's view, God did not begin to exist. Suppose that beginning-to-exist-2 did provide the correct analysis of beginning to exist. On Craig's

[9] Bobier (2013) argues persuasively that Craig's latest criteria will not work either.

view, God satisfies the first two conditions in Beginning-to-exist-2. That is, since Craig endorses a first moment (or interval) of time t, God exists at (or during) t and there is no time prior to t at (or during) which God exists. Thus, in order for God to be beginningless, God must violate the third condition, that is, there must obtain a state of affairs in the actual world in which God exists timelessly. Bobier argues that there cannot be such a state of affairs. As Bobier argues, no state of affairs obtains in which God exists timelessly prior to Creation because, according to Craig, time began with Creation and there are no states of affairs *temporally prior* to Creation. Moreover, no state of affairs obtains in which God exists timelessly after Creation because, on CCH, God is in time after Creation. Therefore, according to Bobier, the second option entails that there are no actual states of affairs involving God existing timelessly. If so, then, on the conception of beginning to exist we are considering, God began to exist.

One might object that Bobier has moved too quickly in concluding that no state of affairs obtains in which God exists timelessly. While Bobier has argued that no state of affairs obtains in which God exists timelessly before, simultaneous with, or after Creation, one might argue that if a state of affairs in which God exists timelessly did obtain, then, in virtue of being timeless, that state of affairs cannot be before, simultaneous with, or after Creation. Why couldn't a state of affairs obtain in the actual world that simply did not enter into before, after, or simultaneous-with relations? Thus, instead of showing that such a state of affairs does not obtain, perhaps Bobier has merely drawn out an implication of such a state of affairs. In the next section, I elaborate on why we should not commit ourselves to the view that, in the actual world, there obtains both a state of affairs in which God is timeless sans Creation and a state of affairs in which God is temporal with Creation.

3.2.1 Does God's Life Have Two Portions?

I am addressing the notion that there obtain two states of affairs in the actual world: one state of affairs in which, sans Creation, God exists timelessly and another state of affairs

in which, with Creation, God exists temporally. The question becomes in virtue of what the two states of affairs hang together in such a way that both states of affairs include the life of numerically one deity. One could propose that the two states of affairs are two portions of God's life, that is, the portion of God's life in which God is timeless and the portion of God's life in which God is in time.[10] As I argue in this section, I have difficulty seeing how God's life could include both portions; without an adequate conception of how the two states of affairs could hang together, an alternative version of CCH – one that involves only the state of affairs in which God is in time – is preferable. Subsequently, I develop that alternative version of CCH and show the Modal Condition can be utilized in defense of that alternative.

Supposing that God's life includes both temporal and non-temporal portions, we should not say that the atemporal portion of God's life precedes the temporal portion since the atemporal portion cannot enter into temporal relations such as *before* or *after* [Craig, 2001a, 267-268], [Helm, 2001a, 49], [Leftow, 2009, 290-291]. Friends of CCH, such as Craig, Erasmus, and Loke, have themselves argued that the atemporal portion of God's life is not before the temporal portion. On an A-theory of time, when one says that an event is past, one means just that the event has already passed. So, if the atemporal portion of God's life has passed away when God became temporal, then we would have the logically impossible conclusion that the atemporal portion of God's life is past.[11] Thus,

[10]Some theologians will object that, given the doctrine of divine simplicity, God's life cannot be divided into portions. Craig, and other friends of CCH, reject the doctrine of divine simplicity. Moreover, since friends of CCH think that there is a state of affairs in which God is in time, and that God is subject to temporal succession, friends of CCH are already committed to the view that God's temporal life can be divided into successive moments. But to say that God's temporal life can be divided into successive moments is just to say that God's temporal life can be divided into portions. If God's temporal life can be divided into portions, then I have difficulty seeing why friends of CCH wouldn't simply say that the two states of affairs are portions of God's life simpliciter.

[11]According to one popular argument for the view that God is timeless, there is a tragedy in our own temporal existence because, for those of us in time, parts of life fall away from us and can never be recovered. We might look back on our loved ones who are no longer with us, but, so long as we are limited to the present life, we cannot experience, once more, the loved ones who are no longer with us. Proponents of the timeless God point out that God, as a perfect being, must not experience the tragedy of time passing and so no part of God's life falls away from God's experience. This implies that no part of God's life has passed away and that no part of God's life is before any other part, so that God's life is not subject to $A-$ or $B-$relations (or so the argument goes). If God is not subject to $A-$ or $B-$relations, then God is timeless. When Craig (2001b, 132-136) replies to this argument on behalf of the view that God has a temporal portion of God's life, Craig

if there is an atemporal portion of God's life, then, however that portion may be related to the temporal portion of God's life, the atemporal portion, qua atemporal, cannot pass away. (Similar remarks were made in [Kabay, 2009, 128] and [Helm, 2001b, 163].) So, instead, the suggestion might be that the portion of God's life that is in time is present while the timeless portion is not present but, nonetheless, exists *simpliciter*.

This interpretation faces apparently insurmountable problems. For example, the identity conditions between the two portions of God's life are utterly mysterious. God cannot perdure or endure – let alone retain psychological continuity or maintain God's personal identity in some other way – between the two portions of God's life because one portion is not in time. One might instead suggest that there is a kind of continuity between the two portions of God's life because the atemporal portion timelessly causes the temporal portion. Setting aside difficult philosophical issues about whether an atemporal entity can cause a temporal entity, a mere causal relation does not suffice for establishing continuity between the two portions of a life. (For example, someone who clones herself is the cause of her clone, but does not lead one and the same life as her clone.) Without perduring or enduring, I have difficulty seeing how the two portions could be understood as two portions of the life of numerically one deity as opposed to the lives of two deities.

Craig and other friends of CCH are monotheists and so they will want to avoid the conclusion that there is more than one deity. However, at the level of logical consistency, there is no tension that I can see between polytheism and CCH. Happily, there is a second difficulty for the view that God's life includes both temporal and non-temporal portions. To reiterate, we have been considering a view according to which God did not begin to exist because there obtains a state of affairs in which God timelessly exists, a state of affairs in which God is temporal, and the atemporal portion of God's life timelessly causes the temporal portion of God's life. In virtue of being the temporal portion, the

does not object to the notion that, for a timeless God, no part of God's life passes away. This seems to be an implicit admission that timeless entities cannot pass away so that the timeless portion of God's life, qua timelessness, could not pass away. Elsewhere, Craig (2001b, 159) explicitly tells us that for the atemporal portion of God's life, there is no before or after and time does not pass.

temporal portion of God's life is in time essentially and so cannot exist in any possible world from which time is absent. Beginning-to-exist-2 entails that x began to exist only if there obtains no state of affairs in which x timelessly exists. Therefore, since there couldn't be a state of affairs in which the temporal portion of God's life timelessly exists, even if God can be said not to have a beginning, the portion of God's life that is in time would have a beginning. Craig is committed to the principle that anything that begins to exist requires a cause for its existence (Craig [1979], Craig and Smith [1995], Craig and Sinclair [2009, 2012], Carroll and Craig [2016]). If anything that begins to exist does require a cause for its existence, then the portion of God's life that is in time requires a cause for its existence. The only plausible candidate for the cause of the temporal portion of God's life is the atemporal portion of God's life. Craig has argued that any cause of a temporal entity must itself be temporal and that God is temporally related to – in fact, simultaneous with – the Cosmos when God causes the Cosmos to begin [Craig, 2001a, 276]. Thus, the cause of the temporal portion of God's life must likewise be temporally related to – in fact, simultaneous with – the beginning of the temporal portion of God's life. Nonetheless, the timeless portion of God's life cannot be temporally related to, let alone simultaneous with, anything, so that the timeless portion of God's life cannot be the cause of the temporal portion of God's life.[12] Consequently, unless we give up CCH, Beginning-to-exist-2 fails and we need a different analysis for beginning to exist.

There is a third difficulty for proponents of CCH who maintain that God's life includes both a temporal and an atemporal phase. Consider one argument that both the Oxford School (e.g., Padgett [2000], Mullins [2016]) and CCH proponents (e.g., Craig [1998]) have offered against the view that God is absolutely timeless. Some proponents of divine timelessness have argued that if the *A*-theory of time is true, then, even though God cannot undergo intrinsic change in virtue of being timeless, God does undergo changes in God's extrinsic relations (i.e., Cambridge changes) in virtue of God's relationship to a changing temporal reality. To the contrary, friends of the Oxford School and of CCH

[12]Similar points were previously made in [Mullins, 2020, 225] and [Helm, 2011, 222].

have argued that the *A*-theory of time is incompatible with the existence of a timeless entity that is either extrinsically or intrinsically related to temporal entities. For example, suppose that God exists, God was the Creator of some temporal entity E, and that the *A*-theory of time is true. In that case, even if God does not undergo any changes in God's intrinsic characteristics, as time passes and E ages, God undergoes Cambridge changes with respect to E. As Craig (1998, 222-223; 2001b, 140-141) puts the point, when God created the Cosmos, God was not timeless in virtue of the fact that God acquired a new characteristic. But, on Craig's view, any entity that acquires a new characteristic – even if that new characteristic solely involves entering into a new extrinsic relation – is temporal.[13] Therefore, even if God is immutable in God's intrinsic characteristics, Craig concludes that God is subject to temporal passage. Notice that a parallel argument can be provided for the atemporal portion of God's life. If the atemporal portion of God's life is either intrinsically or extrinsically related to the temporal portion of God's life – as is presumably required for the two phases to be portions of numerically one life – and the *A*−theory of time is true, then the timeless portion would acquire a new extrinsic relation when the temporal portion begins to exist. In that case, the timeless portion would not actually be timeless.

Erasmus (2021) and Craig (2001a, 272-273) have each attempted to explain how the atemporal portion of God's life might be related to the temporal portion of God's life. Erasmus draws upon a distinction between an instant and an event. As Erasmus describes the distinction, an *instant* is an indivisible temporal point while an *event* is a change from one instant to another.[14] On a discrete view of time, time can be understood as a series of instants, i.e., t_1, t_2, t_3, ..., t_n, and as a series of events, i.e., $e(1_1, t_2)$, $e(t_2, t_3)$, ..., $e(t_{n-1}, t_n)$,

[13]For example, suppose that God bears an extrinsic relation R to Adam-at-time-t_1 and bears extrinsic relation $\neg R$ to Adam-at-time-t_2. Let's also suppose that Craig's preferred version of *A*−theory, presentism, is true so that only the present moment exists. When t_1 is present, God bears extrinsic relation R to Adam-at-time-t_1 but, since t_2 does not yet exist when t_1 is present, God does not yet bear $\neg R$ to Adam-at-time-t_2. Subsequently, t_1 passes out of existence and t_2 passes into existence. Since God bears $\neg R$ to Adam-at-time-t_2, we know that God must take on the extrinsic relation $\neg R$ to Adam by t_2 and that God must no longer bear R to Adam. But that's just to say that there is succession in God's life and so that God is temporal.

[14]Note that Erasmus departs from the previously mentioned convention that an event is a spatiotemporal location.

where $e(t_i, t_{i+1})$ is the event of changing from instant t_i to t_{i+1}. Erasmus then asks us to consider God at t_1. On a relational conception of time, there is time only if there is change, that is, transition from one instant to another. Therefore, the state of affairs, involving God, at t_1 is the same state of affairs, involving God, as there is at the closest possible world without time. For Erasmus, the distinction between the closest possible world without time and the actual world consists just in the fact that God actualizes the change from t_1 to t_2, that is, $e(t_1, t_2)$. Since the state of affairs, involving God, at t_1 is the same state of affairs as there is at the closest possible world without time, Erasmus understands the state of affairs, involving God, at t_1 as a timeless state of affairs.

Erasmus's response does not adequately address the objection that I have raised. On Erasmus's view, t_1 is *before* t_2 and *passes into* t_2. Therefore, t_1 is temporally related to t_2. If the state of affairs, including God, at t_1 were a timeless state of affairs, then that state of affairs, in virtue of being timeless, could not pass away or into t_2 and could not occur before t_2. Furthermore, I doubt that all friends of the CCH can take up Erasmus's response; for example, Craig has denied both that instants exist and that time is discrete.[15]

Although Erasmus intends for his discussion to be a loose summary of Craig's response, Craig's response is distinct from the response that Erasmus has described. In fact, while Craig agrees with Erasmus that, in the closest possible world without time, the state of affairs involving God at t_1 would have obtained, Craig denies that t_1 obtains in such a world [Craig, 2001a, 272]. Craig's response draws upon two analogies with physical cosmology. In one analogy, Craig (2001a, 272; 2001b, 160) compares God's relationship to time to relativistic cosmological models featuring an initial singularity. As

[15]The reader might be perplexed that Craig denies the existence of instants, given Craig's presentism, but Craig has long argued that instants do not exist. Craig denies that any physical collection could be infinite while also denying the view that time is discrete. If time is continuous, one might have thought that any finitely long interval of time includes an infinitude of instants. In order to avoid the consequence that any interval of time includes an infinitude of instants, Craig adopts the Aristotelian position that intervals of time are fundamental and instants are a kind of mental fiction we arrive at as the boundary points of any given interval. Craig writes that "only intervals of time are real or present and that the present interval (of arbitrarily designated length) may be such that there is no such time as 'the present' *simpliciter*; it is always 'the present hour', 'the present second', etc. The process of division is potentially infinite and never arrives at instants" [Craig, 1993, 260]; also see [Craig, 2000, 179-180], [Craig and Sinclair, 2009, 112-113]. For discussion, see Puryear [2014, 2016], Dumsday [2016], Loke [2016], Zarepour [2021].

Craig rightly points out, according to General Relativity, the initial singularity is not a part of the space-time manifold but should instead be understood as an open boundary to the space-time manifold. Since the open boundary is not part of the space-time manifold, the boundary cannot be said to temporally precede any of the space-time points within the manifold. Craig claims that while the singularity is not temporally prior to space-time, the singularity is causally prior to space-time.

However, this cannot be a good analogy because the reason that the open boundary does not temporally precede any space-time point is that the open boundary does not exist, that is, the open boundary is an absence. Presumably, Craig does not want to commit himself to the view that God lacks being in any portion of God's life, regardless of whether that portion is temporal or atemporal. Moreover, it's at least not obvious to me that the singularity causally precedes space-time. While the nature of causation is philosophically controversial, a variety of theories of causation deny that absences can be causes; if an absence cannot be a cause, then, since an open boundary is an absence, an open boundary cannot be a cause either. Even if we should accept an analysis of causation on which absences can be causes – such as a counterfactual analysis – Craig and other friends of the CCH would be unlikely to accept the view that the Cosmos could have been caused by sheer nothingness; thus, while they might admit absences as causes, they would not admit an absence as the cause of the Cosmos.

In a second analogy, Craig (2001a, 272-273) compares God's relationship to time to the Hartle-Hawking model (1983). As Quentin Smith (e.g., 1997) interprets that model, the initial singularity is replaced by a region featuring "imaginary time". Within that region, the space-time metric has Euclidean signature, with the consequence that there is no metrical distinction between space and time. On Smith's interpretation, that region features four dimensions of space instead of featuring one dimension of time and three dimensions of space. Smith argues that the timeless four-space region is topologically, but not temporally, connected to space-time. Craig (2001a, 273) speculates that perhaps the atemporal portion of God's life is (somehow) topologically, but not temporally, connected

to the temporal portion of God's life. I'm not convinced that Smith correctly interpreted the Hartle-Hawking model,[16] but set that aside. If there is an atemporal portion of God's life that is (somehow) topologically but not temporally related to the temporal portion of God's life, then, once more, that atemporal portion can neither pass away nor into nor be placed before the temporal portion of God's life. Moreover, unless Craig can provide adequate reason to think that the topological joint between the two portions of God's life can support perdurance or endurance between the two portions of God's life, much less psychological continuity or other ways in which personal identity persists, I do not see how the topological joint suffices for showing the portions are the life of numerically one deity. Furthermore, the supposition that there is a topological joint between the two portions of God's life would not suffice for showing that the timeless portion could be related to the temporal portion without the timeless portion undergoing extrinsic change.

Loke (2017, 172) defends the coherency of the view that there is a causally prior timeless portion of God's life in a different way than either Erasmus or Craig. Recall that, according to the way in which CCH proponents have previously described their view, the actual world includes a state of affairs in which God exists alone, exists timelessly, and, in that timeless state of affairs, begins time by initiating the first change. CCH proponents often argue that only an entity with libertarian freedom could have the power to initiate the first change from a timeless state. According to the objection that Loke considers, an entity E, with libertarian freedom, cannot freely initiate change from a timeless state. According to Loke's imagined objector, for some entity E to change is just for E to have property p at some time t_1 and property $\neg p$ at some time t_2, such that $t_1 \neq t_2$. If E changes from a timeless state, then E did not change from one time to another. Loke replies that friends of the CCH can provide a disjunctive definition of change: for some entity E to

[16]For example, Smith's interpretation involves the view that what distinguishes space from time is the distinction between Lorentzian and Euclidean signature. While the signature does provide *a* distinction between space and time, the signature is an implausible candidate for providing a complete explanation of the distinction between space from time for at least two reasons: (i) the signature cannot explain any sort of past/future asymmetry and so cannot explain *A*- or *B*-relations and (ii) we can construct (anachronistically) a model of Newtonian or Galilean space-time that include a space/time distinction while also featuring a metric with Euclidean signature.

change is just for E to have property p at some time t_1 and property $\neg p$ at some time t_2, such that $t_1 \neq t_2$, *or* for E to have property p in a timeless state and property $\neg p$ at some time t. Loke's reply does not appear to be adequate for defending the coherency of changing from a timeless state. If E is in a timeless state, then E cannot pass from that timeless state and into a temporal state since a timeless state cannot, qua timeless, *pass away*. For that reason, Loke is incorrect when he writes, "there is nothing absurd about a personal timeless being deciding to leave His state of timelessness and enter into time" (2017, 175). Moreover, Loke has not provided a way for an entity to perdure, endure, or to persist in personal identity from a timeless state to a temporal state.[17]

The preceding problems evaporate if we suppose that God does not timelessly coexist with the temporal portion of God's life in possible worlds where God is temporal. On the condition for 'beginning to exist' that I propose in this section, in the actual world, God could be beginningless and yet only have a temporal portion of God's life. That is, on my proposal, an entity can have a finite past and yet, even though the actual world includes no atemporal portion of that entity's life, the entity may still be beginningless. Thus, even though God's life may include a first period of time, God could still be said not to have begun to exist. Like Craig, Padgett denies the view that if God is temporal, God could exist only if time exists [Padgett, 2001a, 106]. According to Padgett, God could "live" in a timeless world and has freely and timelessly chosen to live in a temporal world [Padgett, 2000, 122-123]. Since God timelessly chooses for our world to be one that includes time, there is no time at which God makes our world a temporal world and consequently no transition in God's life from an atemporal phase to a temporal phase. On Padgett's view, there is only one phase of God's life. Despite having only one phase in God's life, God

[17]Loke (2017, 172-173) goes on to consider whether the First Cause of the Cosmos could be a physical state and argues that the First Cause must be able to prevent itself from "initially changing". According to Loke, only a timeless person with libertarian freedom, and not a timeless physical state, could prevent itself from initially changing and therefore could not be a physical state. Set aside the fact that a timeless entity should not be described in temporal terms, e.g., as *initially* anything. The real trouble seems to be opposite to the problem that Loke discusses. As a matter of logical consistency, a timeless entity cannot literally *become* anything else and therefore lacks the capacity to change *from* one state *into* some other. Consequently, a timeless physical state, qua timeless, would have no more difficulty "preventing" itself from coming to occupy some non-initial state than would a timeless person with libertarian freedom.

includes atemporal aspects alongside temporal aspects, and the atemporal aspects of God are responsible for the existence of time.

One of the objections previously considered to the view that God's life includes both an atemporal portion and a temporal portion was that if *A*-theory is true, then, once the temporal portion begins, the atemporal portion acquires a new relation. This led to the contradiction that the atemporal portion is both atemporal and temporal. The reader might worry that a similar objection can be provided for the view that God includes both atemporal and temporal aspects. If the atemporal aspect is related to the temporal aspect and we suppose that *A*-theory is true, why wouldn't the atemporal aspect acquire new relations as the temporal aspect changes?[18] In reply, the CCH proponent could say that God includes an atemporal aspect just in case there is an aspect of God that suffices for God's existence and that would have existed even if time did not. (As we will see, this is just to say that the CCH proponent could adopt the Modal Condition.) In that case, all aspects of God are undergoing relational changes throughout the entirety of God's life – the entirety of which is temporal – even though some of those aspects – importantly, aspects that suffice for God's existence – would have existed even if time had not existed.

For proponents of the CCH and unlike the Oxford School, past time is finite, so that the life of any temporal entity includes an initial finitely long period. In that case, there is an initial finitely long period of God's life. If God's life only includes the temporal phase, how could God's life be beginningless? Let's turn back to Bobier. Bobier comes close to suggesting the correct solution when he recognizes that what we require is a "modal fact". According to CCH, in the actual world, 'God is timeless sans Creation' is true. Bobier wonders what fact in our world could make 'God is timeless sans Creation' true. One candidate answer is a modal fact, that is, that had God not created the Cosmos, God

[18]Padgett has made a similar criticism of Whitehead's "dipolar" conception of God, wherein God is conceived as having an absolutely timeless aspect (which Whitehead identifies as God's "primordial nature") and a temporal but everlasting aspect (which Whitehead identifies as God's "consequent nature"). Padgett writes, "It is hard to see how one 'actual entity' can exist in two antithetical modes of being, without destroying the unity of that entity. Since timelessness as Whitehead and most thinkers have understood it is the antithesis of time, no one being can be both timeless (in this sense) and temporal" [Padgett, 2000, 140].

would have existed timelessly [Bobier, 2013, 598].

Padgett similarly offers a modal analysis as part of his study of God's relationship to time. Consider how Padgett argues for his view that while God is in time, God is not necessarily in time. Padgett considers a possible world from which time is absent, but in which God is the Creator of all things other than Godself. As the Creator of all things other than Godself, all things other than God in the timeless world ontologically depend upon God. Padgett grants that such a world is logically possible and, since Padgett believes God can do any logically possible task, Padgett concludes that God could have actualized the timeless world but freely chose to actualize a temporal world instead ([Padgett, 2001a, 106], [Padgett, 2001b, 106-107]).

Padgett (2001a, 106) goes on to say that we have two possibilities for relating God to time, i.e., that either "God's time is a *necessary precondition* to God's Being" or "that God's Being is a necessary precondition to God's time". Padgett (2001a, 107) rejects the possibility that time is a necessary precondition to God's Being. When Padgett proceeds to tells us that "God is not contained within time", Padgett clearly does not mean that God is atemporal. As I've discussed, Padgett is an Oxford Creationist and so agrees with Craig that God is temporal. Instead, Padgett means that God's being is prior in the order of ontological dependence to the existence of time, so that the existence of time should be understood in terms of God's existence and not vice versa. Craig (2001a, 271-272; 2001b, 138) similarly offers a thought experiment that he uses to affirms that, had God not initiated time, our world, including God, would have been timeless. Craig and Padgett agree that God is prior in the order of being to the existence of time; on their view, that God is prior to time explains why, even if time began and God is temporal, God lacks a beginning. In light of Bobier's, Padgett's, and Craig's comments, I propose that the relation of ontological priority between God and time can be understood in terms of a modal fact. I turn to characterizing that modal fact in the next section.

3.3 Theology and the Modal Condition

What modal fact would be adequate for Padgett's or Craig's views? Let T = 'time exists'. Using the standard Lewis-Stalnaker semantics for counterfactual conditionals,[19] let $\Box\!\!\rightarrow$ represent the would-counterfactual conditional. That is, if, in all of the closest possible worlds where A is true, B is also true, then $A \Box\!\!\rightarrow B$. Moreover, let $\Diamond\!\!\rightarrow$ represent the might-counterfactual conditional. That is, if, in at least one of the closest possible worlds where A is true, B is also true, then $A \Diamond\!\!\rightarrow B$. On Craig's or Padgett's accounts, time only exists in virtue of God's contingent and freely-willed act of creation, that is, time is asymmetrically explained by God. Assuming that God necessarily exists, as endorsed by most Christian philosophers and theologians, God exists at all of the nearest possible worlds without time.[20] Without time, God would have existed anyway. Consequently, we have that $\neg T \Box\!\!\rightarrow \exists x.x = God$. Using the modal condition, we can articulate an argument for the CCH proponent's view that, even though God's life may have included an initial finitely long segment, God is nonetheless beginningless:

P1. If any entity is non-temporal, then that entity did not begin to exist.

P2. God is fundamentally non-temporal.

C1. So, God fundamentally did not begin to exist.

P3. Any entity that fundamentally did not begin to exist did not begin to exist simpliciter.

C2. Therefore, God did not begin to exist simpliciter.

[19] Lewis-Stalnaker semantics originates with Lewis [1973] and Stalnaker [1968]. Nothing crucial hangs on the Lewis-Stalnaker semantics and, in fact, I will subsequently appeal to an alternative semantics in order to account for non-vacuously true (or false) counterfactuals with impossible antecedents. The reader can, if they would like, substitute their favorite theory of counterfactual conditionals.

[20] Padgett agrees that God necessarily exists (2000, 123), but argues that God freely chose to create the Cosmos. According to Padgett, Duns Scotus showed that a timeless world is metaphysically possible and that God could have "lived" in such a world (2000, 122). For that reason, even though God necessarily exists, "the actual world could have been timeless". There was no time prior to God's free choice to create a temporal world and so God eternally and contingently wills that our world be temporal. For that reason, Padgett writes, "God's choice [...] to live a certain kind of life – to be dynamic, active, changing – is the ground of the temporality of the universe" (2000, 123).

(P1) is true because any entity that is timeless is beginningless. (P2) is true because God is metaphysically prior to the existence of time and, for that reason, satisfies the Modal Condition. That is, there is an aspect of God that suffices for God's existence and which would have existed even if time had not. (C1) follows from (P1) and (P2) by modus ponens. (P3) is true because for any entity E, if there is an an aspect of E that suffices for the existence of E but which did not begin to exist, then E did not begin to exist. Lastly, (C2) follows from (C1) and (P3) by universal instantiation. Notice that this argument is independent of whether God's life includes an initial finitely long segment and so establishes the CCH proponent's view that God is beginningless even if God's life includes an initial finitely long segment.

Brian Leftow (2005, 58) comes close to articulating the Modal Condition in a discussion of Boethius's conception of divine eternity. According to Leftow, "For all t, a proposition is already true at t just in case it is true at t and would have been true had time never reached t". As Leftow explains, a proposition can then be said to already be true at the first moment of time just in case that proposition would have been true had time not existed. For that reason, at the first moment of time, we can say that God already exists because God would have existed even if time had not. And since, at every time, we should say that God already exists, we should say that God did not begin to exist. Boethius (of course) differs from either proponents of the Oxford School or of the CCH in that, for Boethius, God is not temporal. Nonetheless, if God includes both temporal and atemporal aspects, then, supposing that God's atemporal aspects suffice for God's existence, the Modal Condition arrives at more or less the same analysis of the claim that God did not begin to exist as Leftow's Boethius.[21]

Recall that Erasmus's and Craig's proposals for relating the atemporal portion of God's life to the temporal portion of God's life involved the notion that the atemporal

[21] Likewise, Gregory Ganssle writes, "Now I have to admit that it is strange to say that God *was* timeless. It sounds as if I am claiming that there was a point in time at which he was timeless. What I mean to stress here is it is possible for God to exist without time. If past time is finite, and if God brought time into being, he is independent of time in this way" [Ganssle, 2001, 11].

portion is (somehow) a boundary to the temporal portion. There is another important reason that the CCH proponent should not describe the atemporal portion as a boundary. According to CCH proponents, God created the Cosmos. If the life of the Cosmos included a finite initial period of time, then that finite initial period, itself, has a boundary. If the Cosmos has a past boundary, why shouldn't we conclude that the Cosmos, like the CCH proponent's God, has an atemporal portion of the Cosmos's life and was therefore beginningless? Consider, again, Erasmus's construction. We can imagine a sequence of instants t_1, t_2, ..., t_n comprising the history of the Cosmos. If the state of affairs involving the Cosmos at t_1 had never changed to the state of affairs involving the Cosmos at t_2, then, on a relational theory of time, the Cosmos would have been atemporal. Thus, through reasoning parallel to that which Erasmus provides in the case of God, we should conclude that the Cosmos's initial state of affairs was a timeless state of affairs. Consequently, if Erasmus's argument had been successful, we should say that the Cosmos is beginningless.

Likewise, suppose Craig's analogy between God and singular relativistic space-times was successful. Craig has elsewhere taken Big Bang cosmology to show that the Cosmos had a beginning. But if the singular boundary is an atemporal portion of the Cosmos's life – as Craig's analogy seems to suggest – then the Cosmos was beginningless. (Similar points were previously made in [Mullins, 2020, 226] and [Kabay, 2009, 121].) Moreover, consider that having a temporal boundary is likely to itself be a necessary condition for beginning to exist. Therefore, the claim that either God's life or the Cosmos did not begin to exist *because* God's life or the Cosmos has a temporal boundary should strike us as intuitively absurd and implausible. I think there is a clear reason that CCH proponents say that God was beginningless and that the Cosmos had a beginning. Importantly, according to CCH proponents, while God is prior to time in the order of being, CCH proponents deny that the Cosmos is prior to time in the order of being. On their view, God necessarily exists, so that God would have existed even if time did not, whereas the Cosmos does not exist at the closest possible worlds without time.[22] In other words, CCH

[22]Paul Kabay (2009) has argued that if God exists at all actual times (that is, God is omnitemporal) and

proponents appear to already implicitly endorse the Modal Condition.

Let's turn to three possible objections. First, note that friends of the CCH typically endorse the view that the span of past time is finite. If only the temporal phase of God's life is actual – so that God has only a temporal life and no atemporal phase – what explains the fact that time began a finite temporal interval to the past? Here, I think a variety of proposals can be offered. Suppose, as many friends of the CCH think, the series of past events grows by successive addition and successive addition cannot produce an actually infinite collection of past events. In that case, there is no need to postulate some state that God has prior to time; instead, we need only to postulate that God created an initial state while existing simultaneous to that initial state and then ensured the initial state was added to by successive addition. Since CCH proponents believe an infinitude of past time is metaphysically impossible, CCH proponents should say there is no special explanation required for the fact that, in worlds that include time, past time is finite. (This is not to deny the CCH proponent's claim that the beginning of the Cosmos does require explanation.) Alternatively, if $B-$ or $C-$theory are true, the entire space-time block exists simpliciter and our place a finite distance from one boundary in the block is a purely indexical fact. No particular need for explanation of that indexical fact arises. Thus, whatever metaphysical view of time turns out to be correct, I don't see why a finite past would require God to occupy a timeless state prior to the beginning of time.

The second and third objection are resolved by one solution. For that reason, I will first discuss the two objections and then discuss their common solution. For the second objection, suppose that, perhaps for reasons beyond our ken, the world is better if time exists than if time does not exist. In that case, at any metaphysically possible world w, God knows w is better if time exists, and so God creates time. Time would necessarily exist, even though time would ontologically depend upon God. In other words, the Modal Condition would not be satisfied, even though God would be prior in the order of

time began, then God began to exist ex nihilo. However, Kabay assumes that God has no atemporal mode of being in the actual world. (See [Kabay, 2009, 122-123].) On the view under consideration in this paper, God does have an atemporal aspect.

being to time.

For the third objection, consider that some members of the Oxford School, e.g., Swinburne, depart from the traditional view that God necessarily exists. In that case, we can either suppose that God does not create time in all possible worlds where God exists or that God does create time in all possible worlds where God exists. In the former case, the Modal Condition is satisfied. In the latter case, God would exist at all of the metaphysically possible worlds where time exists. Once more, the Modal Condition would not be satisfied, even though God would be prior in the order of being to time.

As I previously said, both the second and third objections can be handled by a common solution, namely, by generalizing the Modal Condition from including only counterfactual possibilities to including counterpossibilia. I previously said that the counterfactual conditionals that the Modal Condition utilizes can be interpreted in virtue of the Lewis-Stalnaker account of the semantics of counterfactual conditionals. According to one oft-noted problem for the Lewis-Stalnaker account, the account entails that all counterfactual conditionals with impossible antecedents are vacuously true, yet there appear to be counterfactual conditionals with impossible antecedents that are either non-vacuously true or that are false.[23] Importantly, if God necessarily exists, statements like 'had God not existed, time would not have existed' would be counterfactual conditionals with an impossible antecendent. Thus, a suitable generalization of the Modal Condition will need to invoke an alternative semantics for counterfactual conditionals.[24] In any case, once a suitable semantic theory has been chosen, we can consider the possibility that God necessarily exists and necessarily creates time. If God necessarily exists and necessarily creates time, the closest world without time would be a counterpossible world where God exists but fails to create time. On the other hand, if God contingently exists but creates time in every world in which God exists, then the closest world without time would again be

[23]For a recent overview of the debate, see Kocurek [2021]. Also see Berto and Jago [2018].

[24]I take no position in this paper on the correct semantics of counterfactual statements with impossible antecedents, other than that the semantics should allow us to make sense of cases where we would intuitively judge a counterfactual statement with an impossible antecedent as non-vacuously true or as false.

a counterpossible world where God exists but fails to create time. In any case, on the counterpossible version of the Modal Condition, we should still say that, without time, God would have existed anyway.

4 The Disappearance of Time in Physical Cosmology

The proper conception of the Cosmos's beginning is likewise an important question for philosophers of physics. Naturalists are unlikely to find theological arguments appealing, but, as I argue in this section, naturalists can take away an important lesson and thereby derive the Modal Condition for their own non-theological purposes. There are live physical theories, or at least interpretations of physical theories, according to which space-time is reducible to, functionally realized by, emergent from, or otherwise wholly explicable in terms of, some more fundamental non-spatiotemporal physical substructure. If so, whether a given proper part of the Cosmos is spatiotemporal will depend upon whether that part's substructure has the appropriate configuration, just as whether some body of water occupies a gaseous, liquid, or solid state depends upon the configuration of that body's molecular constituents [Oriti, 2021, 27]. In that case, a spatio-temporal proper part of the Cosmos might include the Cosmos's first period of time. Since the Cosmos's existence would be prior in the order of being to the existence of time, there is a deeply intuitive sense in which the Cosmos would lack a beginning – just as a temporal God lacks a beginning if God is prior to time in the order of being – even if there is a first period of time in a non-fundamental proper part of the Cosmos. Thus, just as the theologian can offer an argument for the view that God is beginningless even if God's life includes an initial finitely long segment, so, too, the naturalist can say that the Cosmos is beginningless even if the Cosmos's history includes an initial, finitely long segment:

P1. If any entity is non-temporal, then that entity did not begin to exist.

P2*. The Cosmos is fundamentally non-temporal.

C1*. So, the Cosmos fundamentally did not begin to exist.

P3. Any entity that fundamentally did not begin to exist did not begin to exist simpliciter.

C2*. Therefore, the Cosmos did not begin to exist simpliciter.

As in the theological case, since this argument is independent of whether the Cosmos's history includes an initial, finitely long segment, this argument demonstrates that the Cosmos would be beginningless so long as (P2*) is true, that is, so long as the Cosmos is fundamentally non-temporal.

While the view that physical entities are essentially, and so fundamentally, spatio-temporal has been a long held dogma, there are several distinct ways in which the view has been put into doubt by developments in both philosophy of physics and theoretical physics. Space prohibits me from offering more than a brief survey. Moreover, I do not claim that a decisive case has been made for the view that space and time are non-fundamental.[25] Several of the arguments that I describe remain controversial and, at least in this paper, I do not hope to settle live disputes concerning how to interpret the physical theories that I discuss. Nonetheless, an analysis of beginning to exist should at least be *consistent with* possible future directions of physical inquiry. As such, my aim in this section is to describe several possible avenues of future inquiry with which an analysis of beginning to exist should be consistent.

4.1 An Analogy for the Non-Fundamentality of Space-time

To ease our way into a discussion of the notion that space-time is not fundamental to the physical world, let's begin with an intuitive analogy. Suppose that something like the scenario depicted in *The Matrix* were actual, so that what we ordinarily take to be the external world is, in fact, a computer simulation. Let's call the people who are

[25]Neither quantum gravity nor quantum foundations are areas in which we have reached the end of inquiry. Moreover, given the provinciality of the energy scales that are available to us, we might not be able to probe quantum gravity in sufficient detail to know which quantum gravity theory is correct.

plugged into the Matrix *victims*. The set $\mathcal{S}$ of spatial relationships within the simulation are functionally realized by computers. The set S of spatial relationships between, and within, the physical components comprising the computers might have nothing at all to do with $\mathcal{S}$. Consider, too, the set of temporal relationships $\mathcal{T}$ between the events experienced by the victims plugged into the Matrix. Let's suppose that the computers control the length of the specious present experienced by the victims, so that the duration between two events within the Matrix might have little to do with the temporal durations between events as witnessed by those who have been liberated from the Matrix. In that case, the Matrix functionally realizes $\mathcal{T}$, even though there is a distinct set of temporal relations T outside the Matrix. In other words, by functionally realizing $\mathcal{S}$ and $\mathcal{T}$, the Matrix functionally realizes all of the spatio-temporal relations available to the victims. However, we have not yet envisioned a scenario in which physical reality is fundamentally non-spatio-temporal because the computers running the Matrix are themselves immersed in space-time.

Let's take this thought experiment one step further by considering George Berkeley's God. In Berkeley's metaphysics, all of the objects in our ordinary experience exist, but they are realized within God's mind. Presumably, Berkeley's God would have no difficulty realizing the code running on the computers in the aforementioned thought experiment. But, unlike the computers in the aforementioned thought experiment, God is not, herself, immersed in a spatio-temporal world. Instead of altering how the people within God's mind experience time by modifying their specious present, we can suppose that God is metaphysically responsible for time itself. In that case, God functionally realizes all of the spatio-temporal relations within God's mind and so functionally realizes space and time. For David Spurrett and David Papineau (1999) as well as Barbara Montero (2005), x is physical just in case x is not irreducibly mental;[26] thus, if fundamental reality were not a person, did not instantiate folk psychological predicates, and did

[26]In order to avoid the implication that abstract objects are physical, one might say that any entity E is physical just in case (i) E is concrete and (ii) E is non-mental.

not otherwise instantiate irreducibly mental predicates, then fundamental reality would be purely physical. Therefore, to construct a view on which physical reality is not fundamentally spatio-temporal, we need take only one more step beyond Berkeley's God and suppose that, unlike Berkeley's God, fundamental reality is not a person, does not instantiate folk psychological predicates, and does not otherwise instantiate irreducibly mental predicates.

In the following subsection, I will survey how the view that the Cosmos is not fundamentally spatio-temporal arises in three contexts: first, in the interpretation of relativistic space-times; second, in the interpretation of quantum gravity theories; and, third, in the interpretation of quantum mechanics.

4.2 Non-Fundamental Space-time in Three Contexts

4.2.1 Relativistic Space-times

Relativistic space-times have been interpreted as not being fundamentally temporal [Healey, 2020, 185]. For example, on the standard Minkowskian interpretation of relativity, space and time each disappear and we are left with a kind of union of the two [Minkowski, 1952, 75]. The demand for general covariance in General Relativity is standardly interpreted to mean that the division of space-time into space and time depends upon the adoption of a specific reference frame, with an associated set of coordinates, with the consequence that the division of space-time into space and time lacks metaphysical significance [Oriti, 2021, 21]. If the division of space-time into space and time lacks metaphysical significance, then we should not interpret space-time points as either spatial or temporal points; instead, we should interpret space-time points as belonging to a new category of entities *neutral* between space and time. And if space-time points are neutral with respect to space and time, relativistic space-times are not fundamentally temporal. Einstein went further than Minkowski; contrary to how General Relativity is often presented today, Einstein offered an interpretation in which space-time, itself, is

functionally realized by the gravitational field ("Space-time does not claim existence on its own, but only as a structural quality of the field", 1961, 176; also see Macdonald [2001], Norton [1989]).

On the view that space-time points are themselves neutral with respect to space and time, fundamental physical reality would satisfy the Modal Condition. In order to show that fundamental physical reality would satisfy the modal condition, one needs to show that in the closest possible worlds without time, the temporally neutral space-time points would still exist. Since the points are not fundamentally temporal, the points could have existed without exemplifying $A-$, $B-$, or $C-$relations and so would have existed even if time had not.

4.2.2 Quantum Gravity

While the view that relativistic space-times are not fundamentally temporal is controversial, live proposals for quantum gravity theories provide still more reason to suspect that physical reality is not fundamentally temporal. Importantly, the objects and entities postulated by quantum gravity theories could plausibly have existed without time and so do not satisfy the Modal Condition. For example, if one applies the canonical quantization procedure to the Hamiltonian formulation of General Relativity, one can write down an analogue of the Schrödinger Equation for the universe, called the Wheeler-DeWitt Equation, whose solution is the wavefunction (or the wavefunctional) of the universe. In the Wheeler-DeWitt equation, the Hamiltonian annihilates the universal wavefunction, in turn implying that the universal wavefunction has no time dependence (Butterfield and Isham [2006], Healey [2002], Earman [2002], Barbour [1999, 1994]). Consequently, according to the Wheeler-DeWitt equation, the universe occupies a timeless quantum state. The result is the so-called *Problem of Time* (e.g., Thébault [2022]), wherein physicists ask whether one can recover time in the appropriate limit from a timeless quantum state or if one should give up the approach leading to the Wheeler-DeWitt Equation altogether. While the Wheeler-DeWitt equation remains controversial, one accepted solution is to

say that time should be replaced by a parameter internal to the Cosmos and that can play time's functional role (Butterfield and Isham [2006], Healey [2002], Barbour [1994], Thébault [2022], [Oriti, 2021, 22]). As Carlo Rovelli describes, "An accepted interpretation of [the disappearance of time] is that physical time has to be identified with one of the internal degrees of freedom of the theory itself (*internal time*)" (1991, 442). If time should be recovered as a parameter internal to the Cosmos, then the Cosmos is not fundamentally temporal; the universal wavefunction could have existed even if time had not.

A number of approaches to quantum gravity exacerbate the problem still further (Healey [2002], Huggett and Wüthrich [2013], Huggett and Wüthrich [2018], Huggett [2022], Butterfield and Isham [2006], Bihan [2017a,b, 2019, 2020], Oriti [2014, 2020, 2021], Wilson [2021], Healey [2021], Rovelli [2020]). For example, some approaches to quantum gravity replace the continua (space-time and fields) available in either classical General Relativity or in a quantized gravitational field with new fundamental degrees of freedom that are not spatio-temporal in any traditional sense [Oriti, 2021, 23-27]. As Oriti writes, "The main point should be clear: in quantum gravity, the fundamental degrees of freedom are not continuum fields and spacetime dissolves into pre-geometric, non-spatiotemporal entities, from which space, time, and geometry have to emerge in some approximation" [Oriti, 2021, 23].

As an example, consider Loop Quantum Gravity (LQG). LQG roughly tells us that space-time structure is underwritten by a discrete network of spins. An initial temptation is to think that LQG merely tells us that space-time has a discrete structure instead of the continuous structure postulated by General Relativity. If so, LQG does not deny that physical reality is fundamentally spatio-temporal. This initial temptation is at least not obviously correct for two reasons, to which I now turn.

First, I turn to disordered locality, as originally discussed in Markopoulou and Smolin [2007]. Suppose that the discrete structure found in LQG is a discrete space-time structure. In that case, the spatio-temporal relationships found in General Relativity might be expected to correspond to network structure in a straightforward way. For example,

two objects that are contiguous in the General Relativistic description might be expected to sit at adjacent nodes in the underlying network structure or, at the very least, would be "closer" together in the network than objects that are spatio-temporally separated. However, LQG postulates no systematic correspondence between the spatio-temporal ordering of events and the adjacency relations in the underlying spin network. Some adjacent nodes correspond to space-time points separated by large spatio-temporal distances. For that reason, Le Bihan (2020, 12) has argued that LQG leads to a new form of eternalism ("atemporal eternalism"), on which the structure underlying space-time lacks the formal properties of the space-time block and, consequently, should not be understood as a space-time block.[27] This argument is not decisive; consider that, in the Matrix example I previously gave, the physical world outside the Matrix's structure might not straightforwardly correspond to the spatio-temporal structure of the Matrix, even though the external world might still be spatio-temporal. However, the argument is suggestive in that if the Cosmos lacked spatio-temporal structure, we would expect the fundamental formal structure of the world to substantially differ from that of the effective space-time available to ordinary empirical observations.

In addition to the fact that we might have expected disordered locality (or something close to it) if the Cosmos fundamentally lacked spatio-temporal structure, if disordered locality did correctly describe physical reality, then we would lose much of the justification we would otherwise have had for thinking that the Cosmos is irreducibly ordered according to either an *A*-series or a *B*-series and so much of the justification we would have otherwise had for thinking that the Cosmos is fundamentally temporal. Consider how *A*-theory is typically defended. *A*-theory is typically defended by appealing to our phenomenological experience of time. If loop quantum gravity is true, and so disordered locality is true, then the Cosmos is not fundamentally structured according to the *A*-series found in our phenomenological experience. While the possibility might remain that the

[27] Nick Huggett (2022) has similarly argued that Group Field Theory postulates a structure underlying space-time with an altogether different formal structure from that of space-time.

Cosmos is fundamentally structured according to some other *A*-series, I have difficulty seeing how one could *justify* the view that the Cosmos is fundamentally structured according to an *A*-series. Likewise, consider how *B*-theory is typically understood, e.g., as a series of moments related one to another by *B*-relations. If what we ordinarily take to be moments ordered by *B*-relations turn out not to be reflected in the Cosmos's fundamental structure, as would turn out to be the case if disordered locality turned out to correctly describe physical reality, then we lose much of the justification we might have otherwise had for thinking that the Cosmos is fundamentally organized according to a *B*-series. We would be left with a view according to which the *B*-series we are familiar with is a derivative feature of our world and an open question as to whether fundamental reality is structured according to some other *B*-series.

I now turn to one last reason one might think loop quantum gravity is not fundamentally spatio-temporal. This last reason draws on the fact that loop quantum gravity is a quantum mechanical theory. In virtue of being a quantum mechanical theory, the spin network exists in a superposition state, so that, unlike classical space-time, the spin network does not have a definite or unique structure. Nonetheless, even though the *network* doesn't have a definite or unique structure in virtue of being in a superposition state, the wavefunction describing the superposition state *does* have a definite and unique structure. This suggests (again without definitively establishing) that the wavefunction is the fundamental object and not the spin network. Given that a variety of authors (as discussed below) have argued that we should understand the wavefunction as a non-spatio-temporal object, the object fundamental to loop quantum gravity might be understood as non-spatio-temporal. Whether this is the correct way to interpret the wavefunction remains a live dispute.

In quantum gravity theories where space-time is not fundamental, space-time can be recovered only by considering a sufficiently large collection of nodes, that is, by considering the network's hydrodynamic limit. Since space-time appears in the hydrodynamic limit only when the fundamental non-spatiotemporal degrees of freedom are arranged

in an appropriate configuration, there may have been a physical process, termed *geometrogenesis* [Oriti, 2021, 29–32] (also see Oriti [2014]), whereby the early universe (or the Cosmos) "transformed" from a non-spatiotemporal phase into a spatiotemporal phase. Nonetheless, such a process is conceptually problematic because the non-spatiotemporal phase, qua non-spatiotemporal, cannot stand in the 'before' relation to the spatiotemporal phase. Note that even if the Cosmos cannot possibly include a non-spatiotemporal phase that "transformed" into a spatiotemporal phase, quantum gravity proposals, if true, may still entail that the Cosmos fails to satisfy the Modal Condition because many of the objects or entities postulated by quantum gravity theories could have existed even if time had not existed. However, we may be able to replace our usual notion of time with a kind of "proto-time" and thereby allow "proto-temporal" evolution from the non-spatiotemporal phase into the spatiotemporal phase [Oriti, 2021, 31].

Consider the following toy model for geometrogenesis. Suppose that a cosmological model can be parametrized by some parameter T such that, for values of $T \geq T_0$, T can be interpreted as time, but, for values of $T < T_0$, T should not be thought of as time, since the sub-spatiotemporal degrees of freedom do not "coalesce" in the way required for spacetime to emerge in the hydrodynamic limit. Candidates for such a parameter include the universe's volume or the scale factor [Oriti, 2021, 32]. T should not be thought of as time because T cannot be globally interpreted as time. There is a domain, i.e., $T \geq T_0$, where T plays the functional role of time in our physical theories. Moreover, if one is committed to B-theory, one could postulate that, for $T \geq T_0$, event A is before event B just in case $T(A) < T(B)$. However, when we trace T "backwards" beyond T_0, we encounter a non-spatiotemporal domain where the ordering of the values of T should not be interpreted to correspond to B-relations, but can perhaps be interpreted as proto-B-relations, that is, as ordering relations that are (somehow) more fundamental than B-relations. In any case, even though T_0 would be the beginning of time, there is a clear intuition according to which T_0 would not be the beginning of the Cosmos.[28]

[28] An anonymous reviewer has objected to my toy model of geometrogenesis. As the reviewer notes, one

One might object at this point that I've previously rejected a similar model of God. I rejected the possibility that there is both an atemporal phase and a temporal phase of God's life on the basis that the continuity conditions between the two phases of God's life are utterly mysterious. God cannot perdure or endure from the atemporal phase to the temporal phase, the atemporal phase cannot pass away or into the temporal phase, and the atemporal phase cannot be temporally before the temporal phase. Why shouldn't we reject the possibility that the Cosmos has two phases in its life for the same reasons? First, note that many (perhaps most or all) of the proponents of the CCH are committed to the *A*-theory of time. The view that space-time is not fundamental sits uncomfortably with *A*-theory so that proponents of the view that space-time is not fundamental are much more likely to be *B*- or *C*-theorists. On *B*- and *C*-theory, there is no temporal passage and so nothing passes away or into anything else. Thus, for *B*- and *C*-theorists, there is no problem for the view that the non-spatio-temporal phase does not pass away or into the spatio-temporal phase.[29] Moreover, while we might metaphorically speak about the life of the Cosmos, the Cosmos does not have a life in the sense that God would have a life. For that reason, the Cosmos's life does not need to be unified in the sense that God's life needs to be unified in order to be the life of numerically one deity.

Furthermore, consider that there seems to be a category mistake in supposing that space-time, itself, either endures or perdures. Only objects *within* time persist through time. Time is not an object within time and so we should not say that time persists through time.[30] In Galilean and relativistic space-times, space-time points do not perdure

reason that one might think that T cannot be interpreted as a time parameter for $T < T_0$ is that the state of affairs such that $T < T_0$ does not satisfy the Einstein Field Equations. However, $T < T_0$ might still be interpretable as, for example, a $B-$series and so is interpretable as a time parameter after all. Supposing that the reviewer's objection suffices for showing that $T < T_0$ *can* be interpreted as a temporal series, the reviewer's objection does not suffice for showing that $T < T_0$ *should* be interpreted as a temporal series. For my purposes in this paper, I need only to show that the emergence of time from metaphysically prior, but not temporally prior, non-temporal phenomena is a live option that would be premature to rule out from the arm chair; again, I am not attempting to show which interpretation of any specific quantum gravity theory is the correct interpretation. Instead, I am summarizing a live option that has been discussed in the literature and defending the relatively modest claim that we should take the option seriously.

[29]See the related set of remarks Craig makes in his (1998, 246-248).

[30]Perhaps some readers will object that time trivially persists. Granted, if the persistence of an entity consists only in the fact that the proposition that the entity exists continues to be true from one moment to

or endure.[31] The issue is not only that space-time's proper parts do not persist; after all, many metaphysicians grant that the proper parts of many persisting objects do not persist even though the objects persist. For example, I persist even though the atoms out of which I am composed are replaced through time. Nonetheless, the regions that space-time points compose do not occupy successive space-time regions. We should explain the persistence of objects in terms of their occupation of successive space-time points or regions, but should not be in the business of saying that space-time points or regions themselves occupy successive space-time points or regions. If this question appears to be premised on a category error in the pre-relativistic context, then the question is equally premised on a category error in the relativistic context. If there is a category mistake involved in the view that space-time, itself, either endures or perdures, then there is a category mistake involved in the view that the Cosmos endures or perdures. If there is a category mistake involved in the view that the Cosmos endures or perdures, there is no demand for the Cosmos to endure or perdure through geometrogenesis.

An anonymous reviewer raised an objection to my use of the quantum gravity proposals that I considered in this section. According to the reviewer, the quantum gravity literature considers space-time non-fundamental because the fundamental entities postulated by quantum gravity theories (e.g., strings, causal sets, or whatever) do not satisfy the Einstein Field Equations. For example, when the claim is made that space-time is recovered only as part of a hydrodynamic limit, part of what is being claimed is that the Einstein Field Equations are recovered only as part of a hydrodynamic limit. However, in a discussion of the metaphysics of time, one might argue that we should allow that time

another, then time trivially persists. But there is a more substantive sense in which time does not persist. Consider that, on *B*− and *C*-theory, the space-time block enjoys a kind of eternal, tenseless existence and compare the space-time block's eternal, tenseless existence to the eternal, tenseless existence of abstract objects, supposing that abstract objects exist. Even though, at every time, it remains true that abstract objects exist, we do not ordinarily say that abstract objects persist through time; furthermore, the reason we do not say that abstract objects persist through time is that abstract objects, if they exist, are not objects located *within* time. Likewise, since the space-time block is not an object located *within* time, we should not say that the space-time block persists through time.

[31] If a space-time point did endure or perdure, then an object could be at absolute rest by occupying the same space-time point at successive times. Objects cannot be at absolute rest in Galilean or relativistic space-times. Therefore, space-time points do not endure or perdure in Galilean or relativistic space-times.

has wider application than the Einstein Field Equations. For example, couldn't the $A-$ or $B-$theory of time be true even if the Einstein Field Equations do not apply? At least three replies can be offered to the reviewer's objection.

First, I do not claim that any specific quantum gravity theory is true or that any specific interpretation of any particular quantum gravity theory is the correct interpretation. There may be quantum gravity theories, e.g., causal set theory, that should be interpreted in A-theoretic terms. For my purposes in this paper, I claim only that the non-fundamentality of time remains a live option that should not be ruled out from the arm chair. So long as philosophers of physics are seriously considering the possibility that physical reality is not fundamentally temporal, we need an analysis of the notion that the Cosmos had a beginning consistent with the possibility that the Cosmos is not fundamentally temporal. Second, whatever one might think about the hydrodynamic limit or the possibility of a non-temporal phase of the Cosmos, so long as the entities postulated by live quantum gravity proposals exist at the closest possible worlds without time, we should understand the failure of the Modal Condition as a live possibility. Third, while the reviewer might be correct to say that the reason for thinking the entities fundamental to some specific quantum gravity theory are not spatio-temporal involves the failure of the Einstein Field Equations, there are quantum gravity theories whose fundamental entities should plausibly be thought of as non-temporal for other reasons. Importantly, several of the arguments that I offered were unrelated to whether the Einstein Field Equations apply.

4.2.3 Quantum Interpretations

In addition to relativity and quantum gravity, quantum mechanics has sometimes been claimed to show that space and time are not fundamental. Some of the revolutionaries who first developed quantum mechanics, e.g., Pascual Jordan and Max Born, thought that quantum mechanics had revealed that microphysical entities are not spatiotemporal (Capellmann [2021]; [Kragh, 1996, 47]; [Luminet, 2011, 2915-2918]). In turn, the notion

that microphysical entities are not spatiotemporal inspired Georges Lemaître in the development of an early version of the big bang theory in which the universe originated in a timeless entity (the primordial "atom") (Lemaître [1931]; [Kragh, 1996, 47]; Luminet [2011]).

Several contemporary approaches to the foundations of quantum mechanics likewise suggest that space and time are not fundamental. For example, *wavefunction monism* is the view that all that ultimately exists is the universal wavefunction. (Some wavefunction monists are additionally committed to a "marvelous point" guided by the universal wavefunction or to the "space" inhabited by the wavefunction, though that space should not be thought of as ordinary space-time). We can distinguish at least three versions of the view. In one version of the view, defended by David Albert (2019a, 2019b, 2015, 2013, 1996), Barry Loewer (1996), Alyssa Ney (2021, 2020, 2013, 2012), and Jill North (2013), the universal wavefunction is a field either defined on configuration space or on some more exotic state space (Ney [2020]; also see chapter 4 in Ney [2021]). On this view, the wavefunction is typically thought of as fundamentally temporal and to occupy some kind of space, even if not the space of our ordinary experience. However, other versions of wavefunction monism entail that the universal wavefunction is not temporal. For David Bohm (1980, 211), the universal wavefunction is again a field defined on some high dimensional state space but time results as a consequence of projecting to a lower dimensional space. For Julian Barbour (1999), the universal wavefunction is a field defined on superspace, that is, the space of possible configurations of space-time, and with a distribution and amplitude defined by the Wheeler DeWitt Equation. For Sean Carroll (Forthcoming, 2019) and co-author Ashmeet Singh (2019), the universal wavefunction is a state vector in Hilbert Space. For Bohm, Barbour, Carroll, and Singh, the universal wavefunction is not a temporal object. If all that ultimately exists is the universal wavefunction, and the universal wavefunction is not temporal, then space-time is reducible to, functionally realized by, emergent from, or otherwise wholly and asymmetrically explained by the universal wavefunction.

Thus, there are a variety of live research programs according to which space-time is not fundamental to the Cosmos and is instead asymmetrically explicable in terms of some non-spatiotemporal structure. The non-spatiotemporal structure would be timeless, just as the molecules that comprise liquids lack the property of liquidity. Just as God is beginningless if God stands prior to time in the order of being, so, too, the Cosmos is beginningless if the Cosmos stands prior to time in the order of being.

4.3 Physical Cosmology and the Modal Condition

Recall the lesson that the naturalist can take from the theological discussion in section 3. Timeless entities are beginningless. So, fundamentally timeless entities are fundamentally beginningless. To reiterate, consider an entity A that is fundamentally timeless. In that case, there is an aspect of A – that is, the fundamental aspect – that is timeless. There could be another aspect of A – that is, a non-fundamental aspect – that is not timeless. Moreover, suppose that the existence of the fundamental aspect suffices for the existence of A but A could have existed without the non-fundamental aspect. Supposing that the non-fundamental aspect of A is in time in the actual world, A would still exist at one or more of the closest possible worlds lacking time. Because the fundamental aspect of A is beginningless, and the existence of the fundamental aspect suffices for A's existence, A is beginningless, even if the non-fundamental aspect of A existed for an initial finitely long period of time. Note that the non-fundamental aspect could have had a beginning, but a beginning of the non-fundamental aspect of A is not the beginning of A *simpliciter*.

Recall that for God to be beginningless required $\neg T \; \Box\!\!\rightarrow \exists x.x = God$. So, for A to lack a beginning even though A has an initial finitely long period of time requires that $\neg T \; \Diamond\!\!\rightarrow \exists x.x = A$, that is, had time not existed, A might have existed. Let C represent the statement that the Cosmos exists. Thus, the statement that had time not existed, the Cosmos might have existed anyway, is represented as $\neg T \; \Diamond\!\!\rightarrow C$. We want a necessary (but not sufficient) condition for the Cosmos to have a beginning. To derive such a condition,

we should negate $\neg T \diamond\!\!\rightarrow C$. The negation of $\neg T \diamond\!\!\rightarrow C$ is equivalent to $\neg T \,\Box\!\!\rightarrow \neg C$. So, the Cosmos had a beginning only if

> At all of the closest possible worlds where time does not exist, the Cosmos does not exist.

Unfortunately, this criterion has not been given serious enough attention in philosophical arguments for the beginning of the Cosmos, where authors swiftly move from the Cosmos having a finite past to the conclusion that the Cosmos has a beginning. For example, consider how Wes Morriston summarizes one of the a priori arguments for the beginning of the Cosmos defended by Craig and other friends of the CCH: "If it could be established that an actual infinite could not exist in the real world, then it would follow that a beginningless series of discrete events is impossible and we would have the beginning we are looking for" [Morriston, 2013, 22].

Or consider that, as Norman Kretzmann (1985), William E. Carroll (2007), and Jon McGinnis (2015) point out, Scholastic philosophers assumed a conception of beginning to exist that resembled beginning-to-exist-1. The Scholastic debate concerned whether God's creation of the Cosmos was consistent with the Aristotelian view that the Cosmos had an infinite (and so, on their view, beginningless) past. Scholastics assumed that either the Cosmos had a beginning – in which case they assumed the past must be finite – or else the Cosmos was beginningless – in which case they assumed the past must be infinite. A moment's reflection shows that both friends of the CCH and the Scholastics are incorrect. Supposing that one could show merely that the Cosmos had a finite past, one could not infer that the Cosmos had a beginning; one must also show (among other criteria) that the Cosmos is fundamentally temporal and therefore show that the Cosmos satisfies the aforementioned Modal Condition.

To my knowledge, there is no a priori argument for the Cosmos's beginning that does not run into this blunder; *all* of the a priori arguments for the Cosmos's beginning that I am aware of, even if successful, would establish only that the Cosmos has a finite past

and so fail to establish that the Cosmos has a beginning. Likewise, empirical arguments that appeal to, e.g., the Big Bang, large scale thermodynamic features of the observable universe, or the like fail insofar as their defenders fail to rule out (or at least render implausible) the possibility that the Cosmos is not fundamentally timeless.

5 Conclusion

In this paper, I developed a novel necessary condition for beginning to exist that helps to clarify the proposal that the Cosmos began to exist as well as the theological doctrine that God did not begin to exist. By examining a debate concerning God's relationship to time, I argued that for an entity to begin to exist requires the fulfillment of a specific modal condition. This intuition turns out to be useful in understanding the cosmological implications of theories according to which space-time is not fundamental. One significant upshot was that, despite frequent claims to the contrary, establishing that the Cosmos has a finite past is not sufficient for establishing that the Cosmos began to exist.

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