God Inside Time and Before Creation

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[The paper has been revised slightly, in order to fix some mistakes in the version
that appears as a chapter in *God and Time: Essays on the Divine Nature*, ed. by
Gregory E. Ganssle and David M. Woodruff (New York: Oxford University
Press, 2002) — mistakes for which the editors should not be held responsible! I
leave correction of the remaining mistakes as an exercise for the reader….]

Introduction: Two Questions About Time

Many theists reject the notion that God's eternity consists in his timelessness — i.e., in
his lacking temporal extension and failing to possess properties *at* any times. Some of
these "divine temporalists" hold that, for philosophical reasons, it is impossible to accept
both the timelessness of God and the view that God knows what happens at different
times and brings about events in time.[1] Many reject divine timelessness as a dubious
import from Platonism with no biblical or theological warrant.[2] And some question the
very intelligibility of the doctrine.[3]

There are many serious questions a divine temporalist must answer. One of the
most frequently discussed is whether a temporal God could know ahead of time what I
will freely do, or how any indeterministic system will behave. I shall leave the most
theologically pressing questions to others, however.[4] Here I address two closely related,
more purely metaphysical questions facing divine temporalists: (i) Does time necessarily
involve change? and (ii) Did God have a sufficient reason for creating when he did? The

latter raises the further question whether a divine temporalist can say that, in some sense, time had a beginning.

In what follows, I ignore the relativity of simultaneity, treating *earlier than* and *later than* as simple two-place transitive relations requiring no indexing to reference frame. Some of the arguments will have to do with time's passage before creation, when I suppose there were no spatial frames of reference; so ignoring relativity cannot hurt in that context. Another excuse for treating simultaneity as nonrelative in the present context is the fact that most contemporary divine temporalists hold an "A-theory" of time — that is, a theory of time according to which there is an objectively distinguished present. A-theorists are forced to treat the "simultaneity" of special relativity as something other than *real* simultaneity, that relation that holds between events if and only if it is ever true that both are *present*. In particular, *presentist* A-theorists — those who think that the difference between what is present and everything else is that, well, there *is* nothing else — cannot very well maintain that what's happening *now* is relative to reference frame without also holding that what *exists* is relative to reference frame. And one would be hard pressed to make any sense out of that.[5]

Defining "Intrinsic Change"

There is a sense in which it is a trivial truth that time involves change. This is because there is a trivial kind of change: the species of mere Cambridge change that Sydney Shoemaker calls "McTaggart change".[6] It seems clearly necessary that, as long as time is passing, everything that exists is getting older — however much things may remain intrinsically and spatially unchanged. Most philosophers who have claimed that time

necessarily involves change have meant something more interesting than this. Somehow we must dismiss as irrelevant to the thesis that time involves change all "changes" involving the gain or loss of temporally extrinsic properties, like *being exactly 34 year's old*, and (for tidiness) spatially extrinsic ones, too, like *being three miles from a burning barn*. There is a growing literature on the question how best to characterize intrinsic properties.[7] Elsewhere, I have proposed the following procedure for defining the intrinsic.[8]

Begin with two merely *prima facie* marks of temporal and spatial intrinsicness:

(D1)   *P* is potentially temporally intrinsic =$_{df}$ there is no property *Q* such that either: (a) necessarily, if something has *P* then something either did or will have *Q*; or (b) necessarily, if something has *P* then either it was not the case that something had *Q* or it will not be the case that something has *Q*.[9]

(D2)   *P* is potentially spatially intrinsic =$_{df}$ there is no property *Q* such that either: (a) necessarily, if something has *P* then there is something outside its boundaries that has *Q*; or (b) necessarily, if something has *P* then it is not the case that there is something outside its boundaries that has *Q*.

These criteria jointly constitute mere *potential* intrinsicness only because of problems posed by disjunctive properties, like *being red or three feet from a pig* and *being round or the only thing that exists*.[10] Such properties (if indeed they are properties and not, as some believe, mere "concepts" to which no real universals correspond) are *potentially* spatially and temporally intrinsic; but they can be possessed by something "in virtue of" its possession of a property that fails to satisfy one or both of these definitions.

There are a couple of ways in which one could try to shore up this hole. One might, for example, presuppose some kind of "logical atomism"; there is a basic stock of

nondisjunctive, nonconjunctive, simple properties. Certain of these (perhaps all of them?) pass tests of intrinsicness; any property reached through property-building operations of conjunction, disjunction, and negation working only from the stock of simple intrinsics is itself intrinsic. Anything built in part out of a simple property that fails these tests, or out of a relation, is itself extrinsic. I would be reluctant to take this route myself, in case there are any families of complex properties each of which involves at least one of the others but none of which is "built" entirely out of simple properties. Perhaps the ethical and the modal constitute two such families of properties. And the possibility of infinite complexity is also worrisome; do we really want to rule out, on *a priori* grounds, the possibility of properties that do not admit of analysis into any set of simple properties?

An alternative is to appeal to a rather rich notion of parthood for properties — a notion which others have attempted to explicate in a variety of ways.[11] If there *is* such a property as *being either [red and three feet from a pig] or [red and not three feet from a pig]*, surely it includes *being three feet from a pig* as a part in way that *being red* does not; and this despite the fact that, necessarily, something has the one if and only if it has the other. Similarly for *being both [either red or three feet from a pig] and [either red or not three feet from a pig]*; this, too, has a part that *being red* lacks, despite their necessary coextensiveness. These gerrymandered properties have *being three feet from a pig* among their "Boolean parts" — where a Boolean part of a property is one that can be reached by successive eliminations of disjuncts, conjuncts, and the ontological analogue of the negation operator.[12] But *being red* itself does not have such a part. This suggests the following test for "complete intrinsicness", a category which rules out the above two

gerrymandered properties in virtue of their containing parts that are not potentially

intrinsic.

(D3) P is a completely intrinsic property $=_{df}$ every property that is a Boolean part of P is potentially temporally intrinsic and potentially spatially intrinsic.

The category can then be expanded to arrive at a more general account of intrinsicness

that allows *some* of the gerrymandered properties to qualify as intrinsic as well.

(D4) P is an intrinsic property $=_{df}$ P is necessarily equivalent to a completely intrinsic property.

Theism and the Thesis that Time Involves Change

I think it is fair to say that most philosophers who claim that time necessarily involves

change mean that, for time to be passing, some things somewhere must be changing

intrinsically. So let us assume the following thesis about time and see what

consequences follow for the relationship between God and the temporal order.

(A) Necessarily, for all times t and t^*, t is earlier than t^* if and only if either (1) there is an intrinsic property P such that something ceased to have or began to have it after t but before t^*, or (2) something came into being or passed away after t but before t^*.[13]

Aristotle, Aquinas, and Leibniz all seem to be committed to something like (A),

while maintaining different views about God's eternity and the beginning of time.[14] It is

true that Leibniz sometimes writes as if the mere *possibility* of something's having gained

or lost a property is sufficient to open up a temporal gap.[15] However he does believe that if there were a moment before which nothing in fact differed in any its properties or relations, then there was no temporal interval before that moment even though there was the logical possibility of earlier inconsistent states. So even if he is not committed to (A1), Leibniz is committed to the weaker consequence of (A1) which is my main concern:

(A1*) If a time t is such that (1) there is *no* intrinsic property P such that something ceased to have or began to have it before t, and (2) *nothing* came into being or passed away before t, then t is the first instant of time.

Abstractly, there are four possibilities: (1) God is timeless and time had a beginning; (2) God is timeless and time had no beginning; (3) God is temporal and time had a beginning; and (4) God is temporal and time had no beginning. Aquinas holds the first view.[16] Aristotle must have held either (2) or (4). But it is, naturally, hard to find anyone who accepts (3), the view which would seem to do the least justice to the doctrine of divine eternity. Since I am exploring divine temporalism, only (3) and (4) will be considered. What happens when each of these views is conjoined with (A), the doctrine of no time without change?

On the face of it, (4) would seem the most natural choice between the two. On this view, God's eternity consists in there being no (finite) interval of time such that God does not exist before that time, nor a (finite) interval such that God does not exist after that time. (It is important to speak of intervals and not instants in this statement of temporal eternity; for if time began with a continuous open interval of instants, of finite length, every instant would be preceded by instants at which God existed, but he would

only have a finite past history.) But, given (A1), God's infinite past existence has been characterized by constant change. If both God and other things existed during an interval, than the change may not have involved God directly. But if there were periods during which only God existed, then God Himself must have been undergoing constant intrinsic change during those times. Some have held that the creation is coeternal with God, but dependent upon Him — like a footprint in the sand formed by the pressure of a foot planted there for all eternity.[17] But those who would accept (4) and (A) while affirming that the creation is not infinitely old must suppose that God existed by himself for an infinite length of time, changing constantly.

This supposition is hard to make plausible. It might be thought that, in Christian theology anyway, the internal communion among the persons of the Trinity could be appealed to as the source of dynamic, changing relationships within the Godhead. But God's omniscience and the immutability of his character (not to be confused with the stronger doctrine of God's absolute immutability) make any sort of purely internal divine change nearly unintelligible.[18] If God knows everything at once with utter clarity, he cannot be supposed to think first about one thing and then another — or to think harder about some particularly knotty problem. God need not take time, for instance, to deliberate about what sort of world to create.[19] On a Trinitarian view, the Father loves the Son, the Son loves the Father and is submitted to his will, and so on. But surely God's steadfast character precludes, say, the degree of Christ's love for the Father waxing and waning. And this view must come to grips with Augustine's puzzle about why God should have created the universe at precisely the time he chose rather than earlier or later — a question to be explored at length below.[20]

A Creation of Finite Age and a Temporal Deity

A theist who accepts (A) and is committed to a creation of finite age thus finds herself pushed in the direction of the remaining alternative (3). But doesn't this view have the unacceptable consequence that God has only existed for a finite period? How could any substantial doctrine of divine eternity be compatible with such a view?

If one did not know better, one might almost think that Leibniz held (3).[21] He certainly held that time began with the creation of the world.[22] And there are passages that *suggest* the view that God exists in time: Leibniz frequently talks of God's *having decided* to create one among the infinity of possible worlds; and he often describes God as acting in time and, indeed, *enduring* through time.[23] Explicit references to the doctrine of divine timelessness, as understood by other philosophers, are, if not outright denials of the doctrine, at least quite negative: He quotes with approval a passage from Laurentius Valla's *Dialogue on Free Will*, in which Valla questions whether Boethius himself understood what he meant by an "eternity superior to time"[24]; and he criticizes Hobbes's claim that God's foreknowledge consists in His timeless awareness of all events at once, for "one has no reason to resort to the question how the future is present to God" to explain God's foreknowledge.[25] But the passages that suggest a temporal God cannot admit of a straightforward reading, given: (a) his conception of time as ideal and (b) his commitment to God's unchanging knowledge of all past, present, and future states of the monads. Really, there are just monads that count as "in time" in virtue of each one having a series of (in some sense) incompatible "perceptions" of everything else, a series that matches up with those of all the others, so that the set of perceptions corresponding

to each perception in any monad's series is an equivalence class. These correspondences are the foundation for the merely phenomenal attributions of simultaneity we all make. And since God does not himself have a series of incompatible perceptions, he does not even qualify as "in time" in the (merely phenomenal) sense that monads do. Still, something he says in his correspondence with Samuel Clarke suggests the best thing a person who held (3) could say about God's eternity.

Clarke identifies God's immensity and eternity with His filling up infinite space and lasting through infinite past and future time — time which would pass even if God alone existed. (Clarke need not worry about having to posit an infinite series of intrinsic changes in God preceding creation, since he rejects (A).) Leibniz responds to Clarke with his own account of divine immensity and eternity, an account which, on the face of it, might seem to be compatible with God's temporality and a finite past:

> 'Tis true, the immensity and eternity of God would subsist, though there were no creatures; but those attributes would have no dependence either on times or places. If there were no creatures, there would be neither time nor place, and consequently no actual space. The immensity of God is independent upon space, as his eternity is independent upon time. *These attributes signify only*, [with regard to these two orders of things] *that God would be present and co-existent with all the things that should exist*. And therefore I don't admit what's here alleged, that if God existed alone, there would be time and space as there is now: whereas then, in my opinion, they would be only in the ideas of God as mere possibilities.[26] (My italics.)

Here, Leibniz *seems* to be saying that God's eternity amounts to this: He would exist atemporally if there were no time; but if anything were to exist at a time, then God would exist at that time as well.

Due to Leibniz's idealism about time, and the way in which God is supposed to be aware of all states of all monads, it would be wrong to say that he thought God's co-existing with things at times implied that God was in time. But could Leibniz's account

of eternity be used by someone who thought God's co-existence with temporal things *did* require his being in time? Should the Christian or other traditional theist be satisfied with an account, according to which God has *in fact* only a finite past history? I am not sure how to answer this question; theists from different theological traditions would no doubt approach it in quite different ways. What is clear, however, is that there is little else one could say to save divine eternity from within this perspective. God could not *have been* timeless *before* the beginning of time, and *then* have begun to exist in time once a changing world was created.[27]

Thus acceptance of (A) in conjunction with the view that God exists in time and that the creation has a finite past leaves the theist with a rather unhappy dilemma: Either God existed in a state of constant intrinsic change for an infinite stretch of time before He created the world, or God has a finite past history.

Perhaps Time Does Not Necessarily Involve Change

If (A) is false, as Clarke and Newton believed, then this is a false dilemma: It is perfectly possible that, before He created the world, God alone existed throughout an infinite (or perhaps in some sense "neither infinite nor finite" — an alternative considered below) period of time during which no changes occurred — an infinite stretch of what Prior called "dead time".[28] But *could* (A) be false? One might try to argue directly against the possibility of a period of dead time preceding creation in the following way: At the last moment of dead time it would be true that all succeeding moments would be "live" ones. But this couldn't have been true before the last moment, and so represents a change

occurring *during* dead time. But dead time is supposed to be time in which no change occurs. Thus the hypothesis of dead time leads to a contradiction.

This argument is far from conclusive. First of all, it would only work as an argument against *absolutely* dead time — what we might call "stone-cold dead time", in which nothing changes intrinsically *or extrinsically*. So it is not an argument that directly supports (A). Furthermore, it is by no means obvious that in order for a period of stone-cold dead time to end, there must be a final moment of the period of dead time. If there were a final moment, then (on the assumption that time is continuous or at least everywhere dense) there could be no first moment of live time. But why not suppose it to be the other way around: No last moment of dead time, and a first moment of live time? Indeed, the most plausible rule I know of for deciding whether a state has a last moment of being or a first moment of non-being is the one Norman Kretzmann attributes to Peter of Spain — and his rule favors this latter assignment of first and last moments.[29] But if there is no last moment of dead time, then the above *reductio* will not go through.

As Prior points out, this response to the argument requires "that we do not (like Locke) suppose time to have an intrinsic 'metric'…."[30] For if a certain set of instants in stone-cold dead time intrinsically constituted a day's worth of time, then instants following them would be a day closer to live time. So again there would be some changes in what was supposed to be utterly changeless dead time. The supposition that time lacks an "intrinsic metric" is examined more closely below, where it is seen to suggest an answer to another puzzling question confronting the temporalist.

Augustine's Question: Why Did God Create When He Did?

It seems coherent, then, to deny that time requires change and to suppose that God existed for an infinite stretch of dead time before creating. But there remains Augustine's question: Why did God wait precisely as long as he did? In the controversy between Leibniz and Clarke, Clarke readily admits that God could have created earlier. But then Leibniz can argue as follows: "[S]ince God does nothing without reason, and no reason can be given why he did not create the world sooner; it will follow, either that he has created nothing at all, or that he created the world before any assignable time, that is, that the world is eternal."[31] (Leibniz's own position, alternative 3, escapes this sort of argument by denying that the world could have been created earlier than it was.) Clarke is forced to assert simply that "God may have very good reasons for creating this world, at that particular time he did", although he has no suggestions about what these reasons might be.[32]

Picking up where Clarke left off, Brian Leftow has recently suggested that God might have been waiting until He had maximized His pleasure in anticipating the act of creation, setting to work only when further delay would no longer increase the enjoyment He found in looking forward to making the world.[33] Of course, holders of Clarke's view could solve the problem more simply by rejecting the principle of sufficient reason and its corollary pertaining to God's choices. If God were confronted by a set of mutually incompatible states of affairs none of which was intrinsically better than any other, but any one of which was better than none, then it would be an imperfection in God if He could not arbitrarily select one among these states of affairs and bring it about. The indecisiveness of Buridan's ass is not a virtue but a defect. The set of possible times at which creation could commence presented God with just such an array of alternatives,

and although there is no sufficient reason for his choosing the time he did, it was better (one might suppose) that he pick one arbitrarily than that he either not create at all or create a world coeternal with himself.[34]

Maimonides on God's existence before creation

I think there is another alternative worth exploring for the temporalist; one which would allow that God existed *before* the creation and before any changes occurred, while denying that it makes sense to suppose creation could have begun earlier or later than it did. Moses Maimonides claims that the changeless eternal interval during which God existed before change began is not exactly like the intervals of *true* time which pass when things are changing.

> In the beginning God alone existed, and nothing else…. Even time itself is among the things created; for time depends on motion, i.e., on an accident in things which move, and the things upon whose motion time depends are themselves created beings, which have passed from non-existence into existence. We say that God *existed* before the creation of the Universe, although the verb *existed* appears to imply the notion of time; we also believe that He existed an infinite space of time before the Universe was created; but in these cases we do not mean time in its true sense. We only use the term to signify something analogous or similar to time.[35]

True time is (following Aristotle's formula) the measure of motion. It is, says Maimonides, "a thing created; it comes into existence in the same manner as other accidents".[36] Thus it makes no sense to ask why God created the universe at this particular instant of true time. If God creates changing things, and does not create a sempiternal changing universe, then he has no alternative but to begin true time when he does — namely, at the first moment of true time.

But can the same question be raised with respect to the infinite interval of "something analogous or similar to time" which passed before God created true time? Could God have ended this period of "pseudo-time" earlier or later than he did? My guess is that Maimonides would have said, "No". Unfortunately, he in fact says nothing more about the pseudo-time before creation.

"Pseudo-time" as Metrically Amorphous

The supposition made above that dead time lacks an intrinsic metric suggests a way of filling in some details about the nature of Maimonides's changeless pseudo-time — the dead time before creation during which only God existed. The essential idea to be explored is that the assertion that more (or less) pseudo-time could have elapsed is empty of factual content — "More (less) pseudo-time elapsed" does not really describe an alternative state of affairs, just as some philosophers have thought that "Everything doubled in size overnight" does not describe an alternative to everything's remaining the same size. Thus God's decision to end pseudo-time did not require that he make an arbitrary choice among alternatives.

Those philosophers who believe that time (or space or space-time) has no intrinsic metric (or is "intrinsically metrically amorphous") typically assume that standard measure theory is correct in treating temporal intervals as consisting of a non-denumerable set of durationless instants.[37] Thus temporal intervals resemble geometrical lines which consist of non-denumerable sets of unextended points. Both lines and temporal intervals admit continuous orderings of their members, and are such that every

line segment or temporal interval (of either finite or infinite length) includes the same number of unextended elements.

Now determination of a metric for pseudo-time consists in the assignment of numerical coordinates to instants, and the adoption of a "metric rule" — i.e., a way of finding out the distance between instants on the basis of their coordinates.[38] If we're assigning coordinates with an eye to determining distance relations, we will want to stipulate at least that "the coordinate numbers satisfy the same betweenness relations as the points to which they are assigned".[39] So if instant *B* falls between *A* and *C*, the number assigned to *B* will fall between those assigned to *A* and *C*.

What further constraints are there upon our choice of metric? Every instant is intrinsically alike, and is also the same number of instants away from any other instant (including the first instant of live time); so one might think that nothing else constrains our choice of a metric rule given an arbitrary assignment of coordinates. But if it is purely a matter of convention which metric rule we pick, then there is no fact of the matter concerning how long God waited before creating. (Although such a result would also make it false that God existed for an infinite period before creation, we could retain an essential ingredient of this claim by maintaining that God existed before change began and that every interval of that period is such that God existed before it.) There are two popular ways of trying to show that choice of a metric rule is conventional: The first is essentially epistemological and can be found in Poincaré and Reichenbach;[40] the second appeals to the structure of space and time, and has been championed by Adolph Grünbaum (who finds evidence of it earlier in Riemann).[41] Whatever one might think of their arguments for the metrical amorphousness of the periods of time with which we are

familiar, there are special reasons to think that the dead time before creation would lack a metric.

The simplest sort of metric rule we could adopt to go with our coordinatization of pseudo-time would tell us that the distance between any two instants is equal to the difference between their coordinates. Such a rule will suffice to divide up pseudo-time into congruence classes — sets of intervals having the same measure according to our metric rule and coordinate system. It might be thought that we could choose the wrong metric rule to go with our assignment of coordinates. But how could we tell if we got it wrong? Since the interval admits no changes, no set of continuous instants can be intrinsically different from any other. Our rule will never assign an interval a smaller measure than that of any interval it wholly includes. So nothing intrinsic to the sets of instants themselves can show our rule to be wrong. But could it not be that, if clocks or other devices for measuring time had existed during this pseudo-time, they would have distinguished different congruence classes than those set apart by our arbitrary coordinates and simple rule? For instance, couldn't it be true that two intervals *A* and *B* which come out congruent on our simple rule are such that, if there had been a certain clock running during both of them, its hands would move twice as far during *A* as they moved during *B*? Couldn't it be that *any* of our standard devices for measuring time would show similar discrepancies? But then wouldn't this fact show that our arbitrary coordinates and metric rule were wrong?

Here Poincaré and Reichenbach would say, No, it would not. One could just as well say that our rule was right, but that there were "universal forces" at work in the two intervals which would cause any clock to move half as fast during *B*.[42] But it is

impossible in principle to tell which of these alternatives is the case — so they are not real alternatives at all. There is no factual difference between the supposition that our simple metric rule picks out congruent intervals during which universal forces would have been at work, distorting the deliverances of all measuring devices, and the seemingly incompatible supposition that the clocks introduced would have been running at a steady pace determining a more complex metric rule. So we could *not* choose a wrong metric rule to go with our arbitrary coordinate assignment. But if any rule will do, there can be no determinate fact of the matter about how long an interval of dead time lasts. So the supposition that God could have allowed a longer or shorter interval of dead time before creating does not represent a real possibility.

Many will, with good reason I think, resist this sort of argument for conventionalism.[43] It may be "impossible in principle" to tell the difference between a metric rule that is really faulty and one that is correct but appears faulty because of the presence of universal forces messing up all the clocks. But Richard Swinburne has pointed out a deeper, non-verificationist reason to doubt that a metric rule for pseudo-time could get things wrong: If there were no laws of nature in force during that time (a plausible enough assumption for one who thinks that laws of nature are contingent and depend upon God's activity, or that they depend upon the kind of world God happens to create), then nothing could ground counterfactuals concerning what various kinds of clocks would or would not do throughout a given interval of pseudo-time. In the absence of all truths about such matters as how many times an object like the earth would have circled an object like the sun during a certain interval, their could be no truths about how many years (days, etc.) passed during the interval.[44] So even though the general

verificationist arguments for the metrical amorphousness of time may well fall through, the theist still has a special reason to think that pseudo-time in particular is metrically amorphous.[45]

Why Did God Create at This Instant, Rather than Some Earlier or Later Instant?

One problem remains, however, for the project of salvaging the principle of sufficient reason: Throughout the discussion so far, I have been assuming that the interval of pseudo-time is an extensive continuum made up of instants; but then one can still ask why God chose one particular instant, rather than some earlier or later instant, to be the last moment of pseudo-time; or, if pseudo-time is an open interval of instants, why he did not choose some earlier open subset of the interval to mark the end of pseudo-time. To salvage the principle of sufficient reason here, some real ingenuity is called for. I shall work my way towards a solution, beginning with a consideration of the once popular view that time does not consist of instants, that every event and every period of time is of some finite duration. Someone who adopts the view I'll finally suggest would not even need to appeal to the metrical amorphousness of pseudo-time in order to save the principle of sufficient reason.

Whitehead is famous for advocating this view; but it can be found much earlier, for instance in Malebranche:

> For ultimately duration has no instants as bodies have no atoms; and just as the smallest part of matter can be infinitely divided, infinitely smaller and smaller parts of duration can be given, as is easy to demonstrate.[46]

As Whitehead, Russell, and others, have shown, we can make do without instants and still preserve all the metrical truths about relations among them by substituting an "abstractive set" of durations in place of each instant — a set that, so to speak, "hones in on" that instant alone.[47] But, since the infinitely divisible (but "pointless") temporal continuum we are positing still consists of earlier and later parts, we can still ask: Why did God stop it at the end of *this part*, rather than *some earlier part*?

There are only two ways I can think of to save the principle of sufficient reason at this point: One must suppose *either* (a) that every part of this continuous period of changeless time is essential to the whole (and that there weren't other periods, of other lengths, available for God to chose), *or* (b) that the period in question does not really have parts after all. In either case, stopping pseudo-time at the end of some earlier subinterval would not be an option, and so the principle of sufficient reason would be saved. But how plausible is either supposition? I shall argue that the former must confront serious objections, but that the latter can at least be coherently maintained. However, before giving arguments for either claim, I must catalogue the range of philosophical theories one might have about the nature of "times", and describe the theological misgivings the divine temporalist will probably feel about one of them.

Theism and the Varieties of Substantivalism and Relationalism About Times
On a "substantivalist" account, times are treated as something distinct from the events happening "at" them; on the most plausible version of such a theory, "space-time" is an entity distinct from the things and events located in it, and "times" are infinitesimal slices of this four-dimensional manifold. "Relational" accounts, on the other hand, come in two

basic flavors: (i) those that identify times with sets of simultaneous events (where events
are taken to be particular things, usually spatially located and nonrepeatable), and (ii)
those that identify times with some more abstract, proposition-like entity — a complete,
momentary state-of-the-whole-world. I shall assume this pretty well exhausts the options
for metaphysical theories about the nature of times.

One frequently voiced objection to the thesis that God is in time is that it makes
the deity subordinate to a created thing, namely *time itself*. Some think that Augustine is
making this sort of point when he affirms that God is "the eternal Creator of all time, and
that no time and no created thing is co-eternal" with God.[48] Such worries would have
considerable force for a theist committed to substantivalism about times. The argument
for divine temporalism above might seem to be pushing the substantivalist toward the
view that time and individual times are *contingent things* that nonetheless *must* coexist
with God since he must exist in time. And this will seem problematic to those theists
who want to deny that God had to create any contingent thing at all.[49]

Many prominent A-theorists are relationalists of type (ii): they take great pains to
show that "times" need not be construed as some kind of contingent thing, and that
whatever work they are needed for can be done by conjunctions of tensed propositions or
states of affairs — and so, on this account of the nature of times, there is no *extra*
problem about the relationship between God and times over and above problems about
the relationship between God and such "abstract objects" as propositions or states of
affairs more generally.[50] This sort of divine temporalist responds to the theological
worry, then, by simply denying that God's being in time is to be analyzed as any kind of
relation to contingent creatures called "times". It is necessarily true, of everything, that it

is the subject of tensed propositions. But that does not imply that there are contingently existing things called "times" with which God had to co-exist.

The temporalist might try another response. One might hold that, if there are things in time, then there must exist contingent things called "times" and God must be related to them. But this could be conjoined with the thesis that God need not have been in time, since he need not have created things in time. Given that he chose to create times, he cannot help but co-exist with them (temporally); but that needn't be thought to limit him in any way — or so one might argue.

Type (i) relationalists will deny that times are necessarily existing abstracta. On their view, times are contingent things, sets or mereological sums of simultaneously existing events. Although this would make times contingent things (at least the times that include contingent events — and this will presumably be all of them, or nearly all); it need not force the divine temporalist to say that God had to co-exist with some contingent things that are in any significant sense independent of him. If every event is dependent for its occurrence upon divine activity (perhaps activity going on earlier, perhaps right then), then every time is dependent for its existence upon God.

Rejecting the question: "Why end dead time at just this point?"

Now I am ready to tackle the two ways in which one might try to save the principle of sufficient reason from the latest assault. Supposition (a), that pre-creation dead time has parts but that each is essential to the whole, cannot be maintained on either relationalist construal of times. Consider relationalism (i): Times are really just sets of simultaneous events. The only events going on during pre-creation dead time are those involving God;

and since, *ex hypothesi,* no changes are going on in God, the period contains just one long event — a temporally extended, probably infinitely complex, act of thinking with God as the subject. This event is a single act, and so is not divisible into a first half, second half, etc. It is still temporally extended, however; but then, if we are rejecting substantivalism about times and constructing them out of sets of events, the defender of the first supposition is in trouble. Since, according to (a), the interval contains parts, there must be many sets of events counting as "times" which include this single divine event as sole member, and these times must be temporally ordered. Yet each contains the same partless event, and nothing more. So there is really only the one time before creation after all. The same sort of problem arises for the species of relationalism that takes times to be proposition-like states of the whole world. There's just the one state, involving God and his single act. I cannot see any way to introduce distinctions within this period that will provide the materials out of which distinct times can be constructed — at least no way that is not tantamount to returning to a kind of substantivalism about times. If God alone exists unchanging, there are no changing states of affairs or events upon which a constructivist approach to times can gain a purchase. Some other things would have to be introduced to "mark" distinct parts of this event; but, given temporalism about the deity, they are tantamount to a type of thing with which God must co-exist; and we are back to the theological objection to divine temporalism — that it implies that God had to coexist with something else.

Alternative (b) runs afoul of an initially quite plausible principle: Nothing can be temporally extended unless it either has some parts earlier than other parts, or at least coexists with something that has parts earlier than other parts. Many events that take

time are divisible into shorter events that occupy proper parts of the interval throughout which the whole event lasts. Now perhaps there are simple events — i.e., events that are not divisible into shorter events — that last for more than an instant. But must there not be, in the interval during which such an event occurs, *something* that is divisible into parts that come before other parts?

The temporalist says that God has always been "in time" in at least the sense that there have always been tensed truths about God — for instance, it has *always* been true that: God is presently omniscient, benevolent, etc. The temporalist is unlikely to be happy construing times substantivally as some kind of extra thing that *had* to coexist with God. But the point that is important for present purposes is this: *if* one adopts a substantival view of times, and tries to posit an extended but partless event involving God and occurring during dead time, either there is just one of these substantival times at which the pre-creation event occurs, or there is more than one. If more than one, the question "Why not create sooner?" returns with as much force as ever; if only one, as (b) suggests, then God exists for but an instant before He creates.

One might try to insist that this first substantival "time" is itself extended but partless. Although I am not sure quite what to make of this suggestion, it seems to me to verge on the incoherent. Perhaps an *event* may last awhile but be partless, or a *state-of-affairs* obtain for awhile without this fact consisting in there being a number of distinct states-of-affairs obtaining for shorter periods during the interval; indeed, I find both suppositions quite plausible, as will appear. Yet how could a thing introduced as a *mere time period* be extended yet partless? Periods of time must have different parts for each "place" in them at which an event could occur; a "period" without subperiods has only

one "place" for events to occur; if it is impossible for nonsimultaneous events to occur in a given period, then the "period" is but an instant.

The relational construals of times — as sets of events, or proposition-like states of the whole world — are less objectionable from a theistic perspective. But there are problems in applying them to the dead time before creation. I am supposing that, whatever intrinsic state God is in during this period, it does not change. So, throughout the period, there is only one event available to be in a set of simultaneous events — alternatively, only one proposition-like state of the world. On either story about events, then, there is only one time in dead time. But then isn't this period only an instant in length, so that God's past turns out, unacceptably, to be finite?

Solving the Problem by Treating Periods as More Fundamental than Instants

Not necessarily. The things with which the relationalist identifies "times" must, of course, be able to play the role of "instants" in both ordinary and scientific contexts. So, if we have a theory of motion with variables ranging over moments of time, the relationalist's "times" must satisfy the postulates of our theory; they must, for example, form a compact series if our theory says they should. But there is no reason to suppose that the category of things relationalists posit as satisfying the role of "instants" in ordinary contexts *must* satisfy all aspects of that role (including durationlessness) in *every* context. Our theories (scientific and otherwise) have much to say about post-creation times, but all we want to say about the pre-creation period of time is that it is extended but includes no changes. During that period, there is only one item belonging to the category of things that will, after that point, qualify as instants (i.e., either sets of events,

or obtaining proposition-like world states); but it may be that the pre-creation "time",

although it belongs to the same category according to *one* way of dividing things up,

differs from subsequent "times" in important ways. I shall consider how this might be,

first on a simple version of the sort of relationalism that takes times to be sets of events,

and then on a Priorian world-state account.

The type (i) relationalist typically builds "instants" of time out of sets of (possibly

temporally extended) events in something like the way Russell proposed in *Our*

Knowledge of the External World:

> Let us take a group of events of which any two overlap, so that there is some
> time, however short, when they all exist. If there is any other event which is
> simultaneous with all of these, let us add it to the group; let us go on until we have
> constructed a group such that no event outside the group is simultaneous with all of
> them, but all the events inside the group are simultaneous with each other. Let us
> define this whole group as an instant of time.[51]

(By "simultaneous" Russell clearly means "temporally overlapping".) Russell then goes

on to show what postulates about events are needed to insure that instants, so defined,

form a compact series (achieving true continuity requires more than Russell provides in

these lectures).[52] But all these postulates could be satisfied by the events of our world

even if they included a first member that had duration but no parts. True, a set of events

constructed so as to qualify as "the time of the first event" would count as an "instant",

according to the theory; but there is nothing in Russell's postulates that implies that the

event in question is in fact *brief*.

Matters are similar with the type (ii) relationalist. Prior's "times", world-states

implying everything that is true at a given moment, are something like maximal

consistent conjunctions of tensed propositions. Again, to affirm that such times

constitute a compact series requires certain tense-logical postulates; a continuous series still more.[53] And positing that there is an initial world-state requires another postulate.[54] But one can make all these suppositions while denying that the initial world-state is literally instantaneous.

But doesn't this move take us back to the objectionable thesis that the past is finite in length, and so God's life is finite in length? No. There may be an initial state in the series of times, a state that ended a finite number of years ago, without the whole of past time qualifying as finite in any sense that puts limitations on how long God has existed. Richard Swinburne has a nice argument for the conclusion that there would be no difference "between a divine conscious act that was God's only conscious act and was qualitatively identical throughout which was of finite length, and one which was of infinite length."[55] I shall skip the details, but the idea should be clear enough. In this pre-creation, pre-laws-of-nature period, there is temporal duration but no way of dividing it up into periods with lengths that can be compared — so you cannot take some portion of the event and say that there must be either finitely many or infinitely many discrete parts of the event of comparable length in the whole period. And since the state is initial there is no beginning to time, no earlier "first moment" distinct from this state.

One might raise the following sort of theological objection to this view: If we are free to say that the period in question is of any length at all, then we can say it is *infinitesimal*. But in that case, we can say with just as much truth that God's history is *not* in fact limitless, that the period during which God has existed is finite — only infinitesimally longer, in fact, than the history of his creation.[56] And surely we want this to come out as definitely false, completely inappropriate as a way of describing the length

of time during which God has existed. At this point one might respond with an appeal to the alleged impossibility of instantaneous conscious states. Here is one of C. L. Hamblin's objections to "the contention that phenomenal time is subdivisible into instants":

> Instants can have no content: it takes too many of them to make up a durable experience. The red book on my table can turn green for half a second or half a century but it cannot turn green durationlessly and instantaneously at the stroke of twelve, remaining red at all times earlier and later. To put the objection another way: the temporal continuum is richer than we need for the description of the world, in that it permits the description of phenomenally impossible states of affairs such as that my book should be red at all rational points of the time-scale and green at all irrational ones.[57]

And so one might argue that an experience of red or any other conscious state that lasts for but an instant is "phenomenally impossible". But in that case, God's single conscious act preceding creation, whatever else it might be, is definitely *not* instantaneous. Could it be non-instantaneous but still infinitesimal? I doubt that we need worry too much about how this ostensible possibility is to be ruled out: Hamblin's reason to doubt the possibility of instantaneous conscious states probably applies just as well to the possibility of merely infinitesimal conscious states.

Standard analysis has no place for infinitesimal durations; what is being suggested is that the proper mathematization of a continuum of conscious events requires the additional complexity posited by nonstandard analysis. But could the additional complexity — the positing of conscious events of infinitesimal duration — correspond to any mental reality, divine or otherwise? If not, and if absolutely instantaneous consciousness is impossible; then, although God's pre-creation state may not properly be

said to be either finite or infinite, it is also definitely *not* instantaneous or infinitesimal — it lasts for a period, although there is no fact of the matter about the length of the period.

It looks, then, as though the divine temporalist has plenty of options as she faces questions about the time before creation. She need not suppose that God did anything arbitrary in deciding to create when he did (although I do not see that there would be a huge cost involved in supposing this); nor need she suppose that God was undergoing some kind of eternal, internal change before creating. Nor need she be committed to "times" as some kind of independent, contingent things, necessarily coeternal with the everlasting God.

Conclusions

The morals to be drawn from this reconnaissance mission into several possible temporalist doctrines of creation, are these: (1) It is hard to be a divine temporalist and accept the philosophical thesis that there is no time without change; and (2) One can maintain both that God existed unchanging before creation, and that he did not choose to create when he did arbitrarily, but only by eschewing substantivalism about times — a move that is theologically well-motivated, in any case.[58]

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Notes

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[1] Norman Kretzmann gives an argument for the incompatibility of God's immutability (and thus of His timelessness as well, since the latter implies immutability) with knowledge of propositions involving temporal indexicals; see "Omniscience and Immutability", *Journal of Philosophy* 63 (1966), pp. 409-421. Nicholas Wolterstorff offers a similar argument explicitly aimed against divine timelessness; see Wolterstorff, "God Everlasting", in *God and the Good: Essays in Honor of Henry Stob*, ed. by Clifton J. Orlebeke and Lewis B. Smedes (Grand Rapids, Michigan: Eerdmans, 1975), reprinted in *Contemporary Philosophy of Religion*, ed. by Steven M. Cahn and David Shatz (New York: Oxford University Press, 1982), pp. 77-98. Stephen T. Davis and Richard Swinburne give arguments for the temporality of God on the basis of his bringing about events in time: see Davis, *Logic and the Nature of God* (Grand Rapids, Michigan: Eerdmans, 1983), pp. 11-13; and Swinburne, *The Coherence of Theism* (Oxford: Clarendon Press, 1977), pp. 214-215. The most recent arguments along these lines may be found in Alan Padgett, *God, Eternity and the Nature of Time* (New York: St. Martin's Press, 1992); and Richard Swinburne, "God and Time", in Eleonore Stump (ed.), *Reasoned Faith* (Ithaca and London: Cornell University Press, 1993), pp. 204-222. Edward Wierenga raises some serious objections to Swinburne's argument in "Timelessness out of Mind: On the Alleged Incoherence of Divine Timelessness", this volume.

[2] See Oscar Cullman, *Christ and Time*, trans. by Floyd Filson (London: SCM Press, 1951); William Kneale, "Time and Eternity in Theology", *Proceedings of the Aristotelian Society* 61 (1960-61), pp. 87-108; Bruce Reichenbach, "God Limits His Power", in *Predestination and Free Will*, ed. by David Basinger and Randall Basinger (Downers Grove, Illinois: InterVarsity Press, 1986), pp. 112-15; Richard Rice, "Biblical Support for a New Perspective", in Clark Pinnock et al., *The Openness of God* (Downers Grove, Ill.: InterVarsity Press, 1994), pp. 11-58; and John Sanders, "Historical Considerations", in Pinnock et al., *The Openness of God*, pp. 59-100.

[3] Samuel Clarke claims that "there are many Learned Men, of far better Understanding and Judgment [than the Schoolmen], who have rejected and opposed [divine timelessness]." And in a footnote he quotes approvingly from two such men, Gassendi and Archbishop Tillotson; the latter of whom says of the doctrine that the eternity of God is *duratio tota simul*, "let them that can, conceive." See Clarke, *A Discourse Concerning the Being and Attributes of God*, in *The Works*, Vol. 2 (New York and London: Garland Publishing, Inc., 1978; first published 1738), pp. 540-41.

[4] Many divine temporalists have been working out what they should say about traditional doctrines of providence, foreknowledge, immutability, etc. In the vanguard are the contributors to *The Openness of God*: Clark Pinnock, Richard Rice, John Sanders, William Hasker, and David Basinger. See, for instance, Sanders, *The God Who Risks* (Downers Grove, Ill.: InterVarsity Press, 1998), and Basinger, *The Case for Freewill Theism* (Downer's Grove, Ill.: InterVarsity Press, 1998).

[5] For defenses of the A-theory in the face of relativity, cf. Prior, "Some Free Thinking about Time~~...~~", reprinted in van Inwagen and Zimmerman, eds, *Metaphysics: The Big Questions*, pp. 104-107~~;~~ Quentin Smith, *Language and Time*, Ch. 7~~;~~ Michael Tooley, *Time, Tense and Causation* ~~(Oxford: Clarendon Press, 1997),.~~ Ch. 11; and especially Franklin Mason, "Presentism and the Special Theory", forthcoming.

[6] Actually, ~~Sydney~~ Shoemaker calls this sort of change "McTaggartian change"; but if we don't have to pronounce "Cambridgean" then we shouldn't have to pronounce "McTaggartian" either. See Shoemaker's "Time without Change", reprinted in his *Identity, Cause, and Mind* (Cambridge: Cambridge University Press, 1984).

[7] See, e.g., Roderick M. Chisholm, *Person and Object* (LaSalle, Ill.: Open Court, 1976), p. 127; Jaegwon Kim, "Psychophysical Supervenience", *Philosophical Studies* 41 (1982), pp. 51-70, reprinted in Kim's *Supervenience and Mind*, pp. 175-193 (cf. especially p. 184 in the latter volume); and David Lewis, "Extrinsic Properties", *Philosophical Studies* 44 (1983), pp. 197-200.

[8] This theory of the intrinsic was first set forth as Appendix A of my paper, "Immanent Causation", in *Philosophical Perspectives*, Vol. 11 (Mind, Causation, and World), (1997), pp. 433-71. Rae Langton and David Lewis take a similar approach in their "Defining 'Intrinsic'", *Philosophy and Phenomenological Research* 58 (1998), pp. 333-345. Our work was independent.

[9] Notice that (b) rules out such properties as being the first event or the last event. Matthew Davidson has objected that there may be properties about which it is necessarily always true that they both will be exemplified by something and that they have been exemplified by something. Call such properties "universal time-impliers", since, if there were such, every property would be necessarily such that, if something has it, then something will have a time-implier and something did have a time-implier. If there are universal time-impliers, then nothing will count as a potentially temporally intrinsic property according to (D1). Why might one think there are universal time-impliers? I am not sure what reasons Davidson had in mind, but here is a set of views that would require them. If one thought that every possible world is a temporal one, that time cannot possibly end or begin, and that there could be no moment at which absolutely *nothing* exists, then properties everything has necessarily, or essential properties of necessary beings, would all be universal time-impliers. To dispel this worry, one may simply modify the definiens of (D1) so that it begins: "there is no property Q that is not a universal time-implier and that is also such that either: (a)...".

[10] A proposal in the spirit of this one is considered by David Lewis, in "Extrinsic Properties", and rejected for its failure to cope with disjunctions of this sort.

[11] There is David H. Sanford's method of distinguishing various kinds of disjunctive, conjunctive, and independent predicates in terms of their boundaries; and Chisholm's intentional procedure, dividing properties along lines marking our ability to conceive of them independently. Cf. Sanford, "A Grue Thought in a Bleen Shade: 'Grue' as a Disjunctive Predicate", in *Grue! The New Riddle of Induction*, ed. by Douglas Stalker (Chicago and La Salle, Ill.: Open Court, 1994), pp. 173-192; and Chisholm, "Properties and States of Affairs Intentionally Considered", reprinted in his *On Metaphysics* (Minneapolis, Minn.: University of Minnesota Press, 1989), pp. 141-149. It is my hope that, on any sensible approach to the problem of determining whether one property is a negation of another, or a conjunction or disjunction of two others, the definitions below which make use of the notion of "Boolean part" will remain adequate.

[12] Note that properties formed in nonBoolean ways, such as by attaching the modal property-building operator "necessarily exemplifying..." or the intentional operator "believing something to exemplify..." to a property, are treated as noncomposite by this test of intrinsicness.

[13] (A1) implies that time is noncircular and dense.

[14] Cp. Aristotle, *Physics*, Bk. 4, Ch. 11; Aquinas, *Summa Theologica*, Pt. 1, Q. 46; and Leibniz, *The Leibniz-Clarke Correspondence*, ed. by H. G. Alexander (New York: Barnes and Noble, 1984), Leibniz's third paper, ¶ 4. Sometimes Leibniz writes as if the mere *possibility* of something's having gained or lost a property is sufficient to open up a temporal gap [see, e.g., "Reply to the thoughts on the system of preestablished harmony contained in the second edition of Mr. Bayle's Critical Dictionary, Article Rorarius" in Leibniz's *Philosophical Papers and Letters* 2nd ed., ed. by Leroy E. Loemker (Dordrecht: D.

Reidel Pub. Co., 1969), p. 583]. However he clearly believes that if there were a moment before which nothing in fact differed in any its properties or relations, then there was no temporal interval before that moment even though there was the logical possibility of earlier inconsistent states. So even if not committed to (A1), he is committed to the weaker consequence of (A1) which is our main concern: (A1*) If a time t is such that (1) there is *no* temporally non-trivial property or relation P such that something ceased to have or began to have it before t, and (2) *nothing* came into being or passed away before t, then t is the first instant of time.

[15] See, e.g., his "Reply to the thoughts on the system of preestablished harmony contained in the second edition of Mr. Bayle's Critical Dictionary, Article Rorarius", in Leibniz's *Philosophical Papers and Letters* 2nd ed., ed. by Leroy E. Loemker (Dordrecht: D. Reidel Pub. Co., 1969), p. 583

[16] See *Summa Theologica*, Pt. 1, Q. 46, Arts. 1 and 2.

[17] The analogy is put into the mouths of "the Platonists" by Augustine, *City of God*, Bk. 10, Ch. 31.

[18] Brian Leftow has an ingenious proposal for a kind of constant change in God prior to creation that would explain why God created when he did; see "Why Didn't God Create the World Sooner?", *Religious Studies* 27 (1991), pp. 157-72. Leftow's suggestion will be considered below.

[19] Aquinas reminds us of this, and concludes that the first moment of creation was the first moment of time — God did not need a moment alone beforehand to think about what He would do. See *Summa Theologica*, Pt. 1, Q. 46, Art. 2, Obj. 3 and reply.

[20] See Augustine, *Confessions*, Book XI, Ch. 30; and *City of God*, Bk. 11, Chs. 5 and 6. Compare Leibniz's argument with Clarke, *The Leibniz-Clarke Correspondence*, Leibniz's fourth paper, ¶. 15. Recently, Brian Leftow has suggested that "God can delay creating to enjoy anticipating a universe and/or desiring to create one" ("Why Didn't God Create the World Sooner?", p. 163).

[21] Indeed, *this* one did think Leibniz held (3), when, as a graduate student, he wrote the first draft of this paper. I thank Jeremy Pierce, Nicholas Jolley, and John Hawthorne for helping me get clearer about this.

[22] *The Leibniz-Clarke Correspondence*, Leibniz's fifth paper, ¶ 55.

[23] E.g., *Theodicy* (La Salle, Illinois: Open Court, 1985), p. 355; and the "Refutation of Spinoza", in *Leibniz: Selections*, ed. by Philip P. Wiener (New York: Charles Scribner's Sons, 1951), p. 489.

[24] *Theodicy*, ¶. 406.

[25] "Reflexions on the Work that Mr. Hobbes Published in English on 'Freedom, Necessity, and Chance'", in *Theodicy*, p. 398. Also, in his discussions of the problem of foreknowledge and freewill, he grants that there must be a sufficient ground in the present of the truth of future free actions in order for God to foreknow them (*Theodicy*, ¶¶. 34-47, and ¶. 360).

[26] *The Leibniz-Clarke Correspondence*, Leibniz's fifth paper, ¶ 106.

[27] William Craig ("Tensed vs. Tenseless Theory of Time", p. 222) talks as though God could be in time once he begins to sustain a universe, but exist timelessly "*sans* creation" — which means not exactly *before* time, although it sometimes sounds like it.

[28] Arthur N. Prior coins this term in "The Logic of Ending Time", in his *Papers on Time and Tense* (Oxford: Clarendon Press, 1968), pp. 98-115. The brief arguments that follow are thumbnail sketches of ones Prior examines more carefully in this paper.

[29] Peter's views are described and given a rationale by Norman Kretzmann; see "Incipit/Desinit", in *Motion and Time, Space and Matter*, ed. by Peter K. Machamer and Robert G. Turnbull (Ohio: Ohio State University Press, 1976), pp. 112-113.

[30] Prior, "The Logic of Ending Time", p. 115.

[31] *The Leibniz-Clarke Correspondence*, Leibniz's fourth paper, ¶ 15.

[32] *The Leibniz-Clarke Correspondence*, Clarke's fourth reply, ¶ 15.

[33] Leftow, "Why Didn't God Create the World Sooner?", pp. 163-71.

[34] Cf~~p~~. Thomas Senor, "Divine temporality and creation *ex nihilo*"~~, forthcoming in~~ *Faith and Philosophy* 10 (1993), pp. 86-92.

[35] Moses Maimonides, *The Guide for the Perplexed*, 2nd ed., trans. by M. Friedländer (New York: Dover Publications, Inc., 1956), Pt. 2, Ch. 13 (p. 171).

[36] Maimonides, p. 171.

[37] I have in mind primarily Adolf Grünbaum and Wesley C. Salmon. See Grünbaum's *Philosophical Problems of Space and Time*, 2nd ed. (Dordrecht: D. Reidel Publishing Co., 1973); and Salmon's *Space, Time, and Motion*, 2nd ed. (Minneapolis: University of Minnesota Press, 1980).

[38] Cf. Salmon, *Space, Time, and Motion*, pp. 59-62.

[39] Salmon, *Space, Time, and Motion*, p. 60.

[40] Compare Henri Poincaré, *Science and Hypothesis* (New York: Dover Publications, Inc., 1952); and Hans Reichenbach, *The Philosophy of Space and Time*, trans. by Maria Reichenbach and John Freund (New York: Dover Publications, Inc., 1958).

[41] See Grünbaum, *Philosophical Problems of Space and Time*; and B. Riemann, "On the Hypotheses Which Lie at the Foundations of Geometry", in *A Source Book in Mathematics*, ed. by David E. Smith (New York: Dover Publications, Inc., 1959).

[42] For the distinction between "universal" and "differential" forces, see Hans Reichenbach, *The Philosophy of Space and Time*, Ch. 1.

[43] For cogent summaries and criticisms of analogous arguments for conventionalism with respect to spatial measurements, see Graham Nerlich, *The Shape of Space* (Cambridge: Cambridge University Press, 1976).

[44] For elaboration of this thesis, see Richard Swinburne, "God and Time", pp. 208-211.

[45] If a period of dead time in which God exists alone would be metrically amorphous, then the divine temporalist has a handy solution to another theological objection. The claim that nothing could exist without being in time — i.e., that as a matter of logical necessity anything that exists is the subject of tensed propositions — does not imply that God's life is *necessarily* divisible into temporal periods like hours and days; it is true that, before creation, God *then* existed, but it need not have been true then that the moment of creation was approaching at some rate or that distinguishable periods of God's life were passing by. This point is made by Richard Swinburne, "God and Time", pp. 218-220.

[46] I thank Robin Collins for posing this question.

[46] Nicolas Malebranche, *The Search after Truth*, Bk. 1, Ch. 8, § 2; pp. 38-39.

[47] Compare A. N. Whitehead, *The Organisation of Thought, Educational and Scientific* (London: Williams and Norgate, 1917), Chs 7 and 8; Whitehead, *The Concept of Nature* (Cambridge: Cambridge University Press, 1920), Chs 3 and 4; Bertrand Russell, *Our Knowledge of the External World* (London: George Allen and Unwin, 1926), p. 124-127; Russell, "On Order in Time", reprinted in his *Logic and Knowledge*, ed. by Robert C. Marsh (New York: Capricorn Books, 1971), pp. 347-63; and C. Anthony Anderson, "Russell on Order in Time", in *Rereading Russell: Essays on Bertrand Russell's Metaphysics and Epistemology*, ed. by C. Wade Savage and C. Anthony Anderson (Minneapolis: University of Minnesota Press, 1989), pp. 249-63.

[48] *Confessions*, trans. by R. S. Pine-Coffin (Hammondsworth, England: 1964), ~~trans. by R. S. Pine-Coffin (Hammondsworth, England: 1964),~~ p. 279 (Book XI, Ch. 30).

[49] Cf. Brian Leftow, *Time and Eternity*, pp. 273-279.

[50] See A. N. Prior, *Past, Present and Future* (Oxford: Clarendon Press, 1967), Ch. 5 ("The Logic of Successive World-States"); R. M. Chisholm, "Objects and Persons: Revisions and Replies", in *Essays on the Philosophy of Roderick M. Chisholm*, ed. by Ernest Sosa (Amsterdam: Rodopi, 1979), pp. 317-88, see esp. pp. 346-359; and, for discussion of Chisholm's construction of times, see Zimmerman, "Chisholm and the Essences of Events", in *The Philosophy of Roderick M. Chisholm*, ed. by Lewis Hahn (Peru, Illinois: Open Court, 1997), pp. 73-100. (I should note that, although Prior identifies his "times" with maximal, consistent world-states or propositions, he would not himself have regarded this as an identification of times with "abstract entities" — for he did not think that quantification over sentential variables required ontological commitment to propositions. See Prior, "Oratio Obliqua", *Proceedings of the Aristotelian Society*, Suppl. Vol. 38 (1963), pp. 115-126.)

[51] London: George Allen and Unwin, 1926, p. 124.

[52] *Our Knowledge*, pp. 125-27. For more detailed treatments, see Russell, "On Order in Time"; C. Anthony Anderson, "Russell on Order in Time"; and Richard Jozsa, "An Approach to the Modeling of the Physical Continuum", *British Journal for the Philosophy of Science* 37 (1986), pp. 395-404.

[53] Prior takes these issues up in several places; see, for instance, *Past, Present and Future*, pp. 71-72.

[54] See Prior, *Past, Present and Future*, pp. 72-73; and *Papers on Time and Tense*, Ch. X.

[55] "God and Time", p. 219.

[56] I thank Peter Forrest for this objection.

[57] Hamblin, "Instants and Intervals", *Studium Generale* 24 (1971), pp. 127-134; the passage cited is on p. 128.