

Faith and Philosophy: Journal of the Society of Christian Philosophers

Volume 14 | Issue 2

Article 3

4-1-1997

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Recommended Citation

Fales, Evan (1997) "Divine Intervention," *Faith and Philosophy: Journal of the Society of Christian Philosophers*: Vol. 14 : Iss. 2 , Article 3.

Available at: <https://place.asburyseminary.edu/faithandphilosophy/vol14/iss2/3>

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DIVINE INTERVENTION

Evan Fales

Some philosophers deny that science can investigate the supernatural - specifically, the nature and actions of God. If a divine being is atemporal, then, indeed, this seems plausible - but only, I shall argue, because such a being could not causally interact with anything. Here I discuss in detail two major attempts, those of Stump and Kretzmann, and of Leftow, to make sense of theophysical causation on the supposition that God is eternal. These views are carefully worked out, and their failures are instructive for any attempt to reconcile eternity with causal efficacy. I conclude by arguing that if knowledge of God is possible, in virtue of His effects upon the world, then it is science that must play the preeminent role in producing that knowledge.

“To say it for all my colleagues and for the umpteenth millionth time...: science simply cannot (by its legitimate methods) adjudicate the issue of God’s possible superintendence of nature. We neither affirm nor deny it... Science can work only with naturalistic explanations; it can neither affirm nor deny other types of actors (like God) in other spheres (the moral realm, for example). Stephen Jay Gould¹

Ever since Copernicus’ publication of *De Revolutionibus* and Galileo’s confrontation with Cardinal Bellarmine, the skirmishes between science and religion have played a central role in the arena of Western intellectual life. If the above passage from Gould strikes a familiar chord, it is because it reflects one sort of *modus vivendi* between the two which has a distinguished history. With roots in Cartesian dualism, it received energetic development in those strands of liberal Protestant theology that were influenced by Kierkegaard.²

Put most crudely, this way of reconciling science and religion divides the world into two distinct realms, one the spiritual realm, the other, the spatiotemporal world of material things. Over the first, theology has proper dominion; over the second, science. It is not only liberal theologians, but also many scientists, who see in this division of labor a way to achieve harmony - or at least peace - between the two enterprises.

This bifurcation of domains has consequences. On the side of theolo-



gy, it ultimately means renouncing - indeed, repudiating - much of natural theology. On the side of science, it means remaining as discretely silent as possible about the religious implications (since allegedly there aren't any) of developments in science.³ But there is, as I hope to show, a further, though related, consequence - and one which theologians, at least, may find unpalatable.

Many conservative Protestants share with their liberal counterparts a skeptical attitude toward natural theology;⁴ but they tend to be far more ready to criticize science when they perceive threats to their religious commitments. To cite just one instance, Alvin Plantinga has recently engaged in extensive polemics against the neo-Darwinian theory of evolution, and has urged Christian scientists to develop scientific theories that are informed by their religious commitments.⁵ To allow that such conflicts can arise with respect to what is true of the physical world is, however, to be committed to the empirical testability of at least some religious systems of thought. It is, in fact, to allow that empirical findings can, via scientific inference, be brought to bear upon religious matters.⁶ From a different direction, conservatives have also been eager to proclaim and defend the legitimacy of revelation - that is, more or less immediate perceptual awareness of the divine.⁷

Underlying these various refusals to isolate religious concerns from empirical and scientific ones is, I think, a single fundamental issue. This *fundamental* question is whether God ever acts upon or causally interacts with the world. Clearly, the Jewish and Christian traditions have long held that God interacts with the world in a multitude of ways,⁸ not only by creating it in the first place but, more especially, by intervening in special ways to direct the course of human history and to win human hearts.

There is, to be sure, a significant strand of thought - deism - which seeks to minimize the role of the deity in mundane affairs. But even deism holds that God created the world. At the other extreme is the view that God's ever-present sustaining activity is a necessary condition for the continued existence of the world and of every contingent particular. So the stakes for both theism and science are high.

In this paper I want to explore the question whether it is possible and proper for science to investigate religious claims concerning the existence and nature of God. Is Gould correct or is he mistaken? I shall not attempt to settle that question; but I will argue for the following theses: (1) If it is at all possible to obtain empirical evidence concerning God, then there is no reason why the supernatural could not, and should not, be a subject of scientific investigation. (2) If God acts upon or interacts (has causal relations) with the world, then there is no reason in principle why we couldn't obtain empirical evidence of that fact. And (3) one ground (perhaps the only plausible ground) for denying the possibility of such causal interaction stems from the doctrine of divine eternity.

If God is eternal - that is, if His mode of existence places Him outside of time altogether - then causal interaction of any kind with the world is impossible. In that case, the issue would be settled in favor of Gould, but only at the cost of denying divine superintendence of nature and humankind. Moreover, *any* sort of empirical knowledge of God would

then be beyond our reach. The only remaining question for theology would be whether strictly *a priori* knowledge of the divine were somehow possible.⁹

It is unclear whether divine-mundane (theophysical) causal connections are possible on the major alternative conception of God - one according to which He is non-spatial and sempiternal.¹⁰ But if God can cause mundane happenings - and theists clearly think He does - then Gould is wrong, and we should confront the fact that theism has empirical consequences. If, for example, a particular theology implies that God would not have brought about the existence of our species via the processes of Darwinian evolution, then the empirical evidence which indicates that our existence *was* brought about in that way counts against that theology. In general, any mundane effect which a theology attributes to a divine action can be investigated to ascertain (a) whether it exists at all; (b) whether, given its existence, a causal chain can be traced backwards from the effect which points to a supra-mundane origin; and (c) whether, conversely, a purely naturalistic causal explanation is available.¹¹ To do this is, *prima facie*, to engage in empirical theory-testing of the most ordinary scientific sort.

I shall proceed, then, as follows. First, I shall examine several contemporary attempts - primarily those of Eleonore Stump and Norman Kretzmann, and Brian Leftow - to show how theophysical causation is possible on the assumption that God is an atemporal agent. Second, I shall consider the possibility of sempiternal non-spatial agency. Third, granting theophysical causation, I shall argue that there are no proper grounds for excluding investigations of such causal connections from the domain of scientific investigation. I shall argue, in fact, that since the scientific disciplines have provided us with the most sophisticated tools we have for investigating causal processes, they deserve a certain pride of place in such investigations.

1. Can an eternal God cause anything?

Is God an active being, or something more like the Platonic Form of the Good, both unmoved and unmoving? Certainly, there is a powerful intuition that if God is neither spatial nor temporal, then He must be an abstract being, or something very like that. And then, intuitively, God could no more cause something than could, say, the number four or the proposition that two plus two equals four. Richard Gale and Nelson Pike both dismiss eternal agency by direct appeal to this intuition.¹² It is an intuition that deserves to be taken seriously: much in the way of philosophical reasoning rests, in the end, upon such basic intuitions. But God is supposed to be a substance, which raises questions about whether there can be atemporal, aspatial substances; and whether, if there can be, any abstract entities are substances. Besides, since much has been done by way of attempts to elucidate the nature of the divine eternity, more needs to be said if this intuition is to be sustained.

In a series of papers, Stump and Kretzmann¹³ have presented a conception of divine eternity which they take to be compatible with theo-

physical agency. Initially, their conception of divine eternity was intended (in part) to help make sense of theophysical causation, by showing how that sort of causation could accommodate the idea that a cause must bear a temporal relation, or at least something like a temporal relation, to its effect.¹⁴ In particular, if *A* is a proximate cause of *B*, we are strongly inclined to think that *A* must either immediately precede, or be simultaneous with, *B*. In the case of divine-mundane causation, Stump and Kretzmann opt for a relation of simultaneity, which they call ET (eternal-temporal) simultaneity. This can't be a strictly *temporal* relation, since one of its relata isn't a time or a temporal entity at all. Rather, God is supposed to occupy an eternal frame of reference in which everything is present to Him all-at-once (but at no time in any temporal series). God's existence has a (nontemporal) unlimited duration, but one not divisible into parts.¹⁵ Because Stump and Kretzmann take *presence* to characterize the divine life; and because they take every temporal occurrence to be present to God, but not sequentially, it is natural to suppose that every mundane event is ET-simultaneous with a single, timeless act of awareness of God's.

To spell this out, Stump and Kretzmann take an important cue from the Special Theory of Relativity (STR) - namely, the idea that simultaneity is not a two-place relation between events or states of affairs, but a three-place relation between these and a frame of reference. Thus, they think of the eternity which God's life occupies as God's frame of reference, and proceed to define ET-simultaneity as follows:

(ET) For every *x* and *y*, where *x* and *y* range over entities and events, *x* and *y* are ET-simultaneous iff:

- (i) either *x* is eternal and *y* is temporal, or vice versa; and
- (ii) for some observer, *A*, in the unique eternal reference frame, *x* and *y* are both present - i.e., either *x* is eternally present and *y* is observed as temporally present; or vice versa; and
- (iii) for some observer, *B*, in one of the infinitely many temporal reference frames, *x* and *y* are both present - i.e., either *x* is observed as eternally present and *y* is temporally present, or vice versa.¹⁶

Stump and Kretzmann go on to remark that ET-simultaneity is a symmetric relation but not transitive. Thus, from the fact that Caesar's crossing the Rubicon and my writing this are simultaneously observed by God (and are each ET-simultaneous with the one Divine Act), it does not follow that they are (ET-) simultaneous with one another in any temporal reference frame.

It is not entirely clear how literally Stump and Kretzmann mean their appeal to STR to be taken as a basis for the extension of the notion of the relativity of simultaneity to the eternal "reference frame." If the relativity of ET-simultaneity is introduced with the intention that it will help give sense to the notion of theophysical causation by providing something like a temporal relation between cause and effect, then the appeal to STR is unhelpful. For in STR, the *rationale* for relativizing simultane-

ity derives from a consideration of how measurements of time within reference frames can be compared; i.e., compatibly with the causal constraints on the transmission of information-bearing signals from one location to another. But this means that the Lorentz transformations *presuppose* the possibility of causal interactions (conforming to certain laws) between items at rest within different inertial frames. So an STR-like rationale can hardly be used to *establish* the possibility of causal interactions between the spatiotemporal world and God.¹⁷

In the light of various objections, including possibly this one, Stump and Kretzmann have more recently modified their definition of ET-simultaneity, as follows:

- (ET') For every x and every y , x and y are ET-simultaneous iff:
- (i) either x is eternal and y is temporal, or vice versa (for convenience, let x be eternal and y temporal); and
 - (ii) with respect to some A in the unique eternal reference frame, x and y are both present - i.e., (a) x is in the eternal present with respect to A , (b) y is in the temporal present, and (c) both x and y are situated with respect to A in such a way that A can enter into direct and immediate causal relations with each of them...; and
 - (iii) with respect to some B in one of the infinitely many temporal reference frames, x and y are both present - i.e., (a) x is in the eternal present, (b) y is at the same time as B , and (c) both x and y are situated with respect to B in such a way that B can enter into direct and immediate causal relations with each of them....¹⁸

The first thing to say about this revision is that it gives up the project of illuminating or helping to explain the possibility of theophysical causation; instead, it straightforwardly *assumes* that possibility. Stump and Kretzmann see no problem with this assumption; but that is surely to fly in the face of the intuition that there is something intrinsically problematic about a causal relation between relata which stand in no temporal relation to one another. Moreover, (ET') - like (ET) - appears to be incoherent if we remove what is problematic by assimilating theophysical causation to the physical causal processes which constrain simultaneity judgments in STR.

As noted, ET-simultaneity is (on either definition) a nontransitive relation. That is what prevents the inference to the conclusion that Caesar is crossing the Rubicon as I now write. But the non-transitivity of ET-simultaneity is the result of a formal feature of the definitions (ET) and (ET') - namely, the requirement that one term of the relation be an eternal being, and the other temporal, together with what proves to be a conception of the eternal reference frame that has no real analogue in STR. This last fact renders STR essentially useless in understanding divine/world causal relations.

We can bring this observation into sharper relief by constructing a relation, simultaneity*, that is modeled upon ET-simultaneity, but with the formal transitivity-blocking feature removed, and with A identified

as the intended eternal being, God:

- (S*) For every x and y , x and y are simultaneous* iff:
- (i) either x and y are both temporal, or one is temporal and the other not, or both are eternal; and
 - (ii) with respect to God in the unique eternal reference frame, x and y are both present - i.e., (a) each is either in the eternal present or is in the temporal present with respect to God, and (b) both x and y are situated with respect to God in such a way that God can enter into direct and immediate causal relations with each of them.

Now (S*) defines a transitive relation; so if Caesar's crossing the Rubicon and my writing are each simultaneous* with the eternal Now, then they are simultaneous* with each other. That is surely odd; but perhaps it does nothing more than reflect the fact that all things are "simultaneous" in "the eyes of God."

However in STR, all event-pairs that are locally simultaneous in any frame of reference are simultaneous in every frame. An event is locally simultaneous with another if the two are simultaneous and occur in the same place. But the invariance of local simultaneity across temporal reference frames is a result of the fact that there is no transmission time for signals travelling between spatially unseparated points. Since God is taken to be causally proximate to every spatiotemporal position, his actions might be supposed to be locally simultaneous with everything that happens: what else could causal proximity come to?

Would it then follow, from the transitivity of simultaneity*, that there is a temporal reference-frame in which Caesar's crossing and my writing occur simultaneously? That depends upon what it is for them both to be temporally present to God, and unfortunately, the best Stump and Kretzmann can do is to try to explain this analogically. The analogy is an essentially spatial one. We are to imagine two parallel lines, the upper representing eternity, the lower one, time. The present (temporal) moment is represented by a spot of light moving along the lower line. The upper line is lighted all at once (and, one must suppose in the analogy, always). Then we are told that "from the viewpoint of a being persisting in the eternal present, each temporal instant is ET-simultaneous with the eternal present, but only insofar as that instant is temporally present, so that from the eternal being's point of view, the entire time line is lighted at once."¹⁹

It is possible to glean from this what some of the formal features of the relation of being temporally present to God are, but when the spatial analogy is removed, it is hard to see how this picture could be brought into substantive conformity with the requirement that God has immediate causal access to everything, at least along the lines that form the very basis of Einstein's reasoning to the conclusion that simultaneity is a three-place relation. One way to achieve this conformity would be to suppose that it does not take any time for causal influence to travel from God to events in the world, or between those events which are the

divine thoughts occurring within the divine eternity. But to say that would either presuppose the very concept of (ET) simultaneity that is being defined, or to take the relation to be one of *temporal* simultaneity, with the consequence that Caesar's action and mine are (temporally) simultaneous - presumably, in every reference-frame. For if God's immediate causal presence to every spacetime point entails his temporal simultaneity with that point, then there can be no temporal separation between events.

What this brings out is the point - with which Stump and Kretzmann will surely concur - that the eternal frame of reference is not really anything like the temporal reference frames of STR. But then the helpfulness of the STR analogy begins to appear illusive. In short, temporal distinctions collapse if one makes the mistake of pushing the analogy with STR seriously. So this can't be right. But otherwise, we are left with a conception of being temporally present to God which is not only impossible to flesh out except via poor analogies, but which cannot be employed in a way that generates a real parallel between the concept of ET-simultaneity and the concept of simultaneity employed by STR.

Stump and Kretzmann might object that, although there is such a relation as ET-simultaneity, there is no such relation as simultaneity*. But since simultaneity* is constructed from temporal simultaneity and the constituents of ET-simultaneity, I can see no reason for supposing that the former doesn't exist if the latter does. I conclude that ET-simultaneity cannot help to elucidate the notion of theophysical causation if God is an eternal being.

But perhaps the more sophisticated approach of Leftow,²⁰ which proceeds along roughly similar lines, can be of more help. Leftow, like Stump and Kretzmann, allows that the divine eternity may possess extension without being divisible into parts; and like them, he conceives the relation between God's mode of being and the world's in terms of reference frames. Moreover, if the role of STR in the Stump/Kretzmann formulation is somewhat equivocal, it is clearly central to Leftow's.

Like Stump and Kretzmann, Leftow feels the tug of the intuition that a proximate causal relation implies something like spatiotemporal contiguity. But if ET-simultaneity cannot perform the task of providing this, how is it to be understood?

In order to avoid having to invoke a concept like ET-simultaneity, Leftow develops an idea he finds in Anselm, according to which temporal things are present to God by existing, with God, in eternity (even as they exist also in time). Leftow's argument for this conclusion begins with what he calls the Zero Thesis:

(ZT) The distance between God and every spatial creature is zero.²¹

From (ZT), Leftow infers that God is spatially contiguous with every spatial location. From that it follows, further, that nothing is in motion relative to God, since its distance from God cannot change. Now consider the thesis:

(M) There is no change of any sort involving spatial, material entities unless there is also a change of place, i.e., a motion involving some material entity.²²

If (M) is true, then it follows that there is no change of any sort which spatial things undergo relative to God. But now Leftow invokes a principle which he derives from the Minkowski representation of the spatio-temporal framework of STR, *viz.*, that every temporal thing is also spatial (which, Leftow holds, follows from the fact that temporal separations in one reference frame can be (partially) transformed into spatial ones in another frame).²³ But if all spatial objects are at rest and changeless with respect to God, then, Leftow concludes, they must all be locatable in a reference frame (eternity) in which they are all locally simultaneous.

We can think of this argument as an ingenious way of establishing a transformation-relation between temporal reference-frames and eternity, without having to rely upon considerations deriving from causal interactions, or signal transmission, between them. I shall not comment upon all of the steps of this argument,²⁴ but the pivotal Zero Thesis seems clearly false.²⁵ From the fact that there is no spatial distance between a spatial location *L* and God, it hardly follows that the two are contiguous, any more than it follows from the fact that something is not yellow that it must be some other color, or from the fact that a fish is neither larger nor smaller than the number four, that it must be the same size as that number.²⁶

Leftow has traded too easily on the disputed semantic relations between interior and exterior negation. This distinction is illustrated by the difference between saying that it's not the case that this chair is happy, and claiming that the chair is unhappy. The former is true; the latter is neither meaningless nor straightforwardly false, but it certainly isn't, for all that, true: it involves a category mistake. Some might say it has no truth-value.²⁷

Similarly, to concede that it's not the case that God (or the number four) lies at any positive distance from this chair is not the same as to affirm that the distance is zero, a claim which could be true only if there were some metric defined on a space, with respect to which the measure of the distance between God and the chair is zero. The claim that God lies a zero distance from the chair is neither meaningless nor straightforwardly false - but it is certainly not true if God is non-spatial, and its truth certainly isn't entailed by its non-falsity.

The claim that God does not lie at any positive distance from the chair is plausible only if construed in terms of *external* negation: that it is not the case that there is any positive distance between God and the chair, or any other spatial location. But neither is it the case that there is a zero distance between these. So the Zero Thesis can't be identified with the true external-negation claim. Even if one denies that a zero distance is a "positive" distance, it is the limit of a converging series of positive distances - e.g., 1 meter, 1/2 meter, 1/4 meter, . . . And there can be no such relation as *that* between a non-spatial God and any point in space.

But Leftow *needs* that sense of distance to argue that nothing moves

relative to God in some reference-frame, e.g. when he says, "But the distance between God and any creature is always the same: every part of God is always at zero spatial distance from any creature, *in any frame of reference.*" [my italics]²⁸ To speak of zero distance in a reference-frame is to use the metric (or at least spatial) sense of zero distance, the sense in which it is the limit of a series of positive distances. But to construe (ZT) plausibly, with the negation external, undermines the argument from (ZT) & (M) & STR to the co-presence of all things in God's eternal reference-frame.

Now God's being outside of time has consequences which parallel those for His aspatiality: in particular, it ceases to be intelligible that God should be cotemporal with, or temporally contiguous to, any temporal item. This makes the relation of theophysical causation unintelligible.

But even if Leftow were right, how would this illuminate theophysical causation? Here I quote two passages:

...perhaps we can argue that an eternal entity acts on those temporal entities that are present with it in eternity, and these actions have consequences for temporal entities as they exist in time. (We could say that actions in eternity are prior to consequences in time not temporally but "by nature.") Perhaps, that is, a time-less deity need not act on temporal things in time to act on temporal things... Of course, these moves leave us the task of explaining causal relations between timeless and temporal entities in eternity. But perhaps we can make headway on this via counterfactuals expressing dependence.²⁹

And in a later passage:

In the reference frame of eternity, the time at which the [divine] action [of sustaining a state-of-affairs (SOA)] occurs = the time at which the SOA is sustained = eternity. In other reference frames this is not so. Rather, in these, the time at which the SOA is sustained is some particular point in time, and the action nonetheless occurs at eternity. But we can accept this with equanimity. STR allows that events or states simultaneous in one frame of reference may be nonsimultaneous in others.

One could urge in response that STR also insists that there are the same temporal relations between causes in all frames of reference. But the foundation of this relativistic demand is the finite velocity of causal signals... As divine causality is not physical and does not work by the transmission of a physical signal, it escapes this requirement though we can nonetheless apply in its case a *conceptual* move (the relativity of simultaneity) that special relativity shows to be legitimate.³⁰

Since the spatial entities that are present with God in eternity are identically the same items that are temporally located, it's hard to see

how God's acting upon them "in eternity" could be distinguished from his acting on them "in time," or what sort of a consequence-relation is supposed to hold between an entity's being acted upon in eternity and its being acted upon in time. Clearly, Leftow can't mean that some state of a thing qua-present-in-eternity causes some change in its temporal state. So all this can come to is that God's action isn't temporal, although its effects are. This, however, marks no advance at all.

Does the second passage help? It supposedly addresses the question of the temporal relation between a divine action and its (immediate) effects. It says that, relative to temporal reference-frames, the action and its effects aren't simultaneous. But then, what is their temporal relation? Or is Leftow prepared to accept the Zero Thesis with respect to spatial contiguity, while refusing to apply it here even though, evidently, there is no temporal distance between God's doings and their effects? And in any case, the *conceptual* move by which STR introduces the relativity of simultaneity makes that relativity legitimate precisely and only because the velocity of signal transmission is finite. It avails nothing to say that divine action does not rely upon the transmission of physical signals, for whatever it relies upon, either there is a lapse of time between the act and its effect, or there is no such lapse. Leftow apparently intends the latter. So again, if God's actions are locally simultaneous with their effects, all temporal distinctions collapse.³¹

The Stump/Kretzmann/Leftow approach then seems hopeless. But Leftow still has one arrow in his quiver. We can draw it out by reflecting that perhaps the hypothesis ascribing causal powers to an eternal God has been given already too long a leash. Isn't there a much shorter way with this hypothesis, a way which consists of reflecting on what we *mean* by "*a* causes *b*," and seeing that the temporal relation is a constituent of our analysis of that claim? If so, then for any *b*, "Eternal God causes *b*" is analytically false.

The trouble with this short way is, in part, that judgments of analyticity are notoriously vulnerable; even if "our concept" of causation incorporates a temporal relation, maybe that just shows the concept to be inadequate or too limited. Nevertheless, partisans of divine eternity are severely restricted in the analyses of causality to which they can appeal, once hope of including a temporal or quasi-temporal relation is abandoned.

A survey of analyses of the causal relation from Hume to the present reveals few candidates.³² Hume himself was prepared to relinquish spatial contiguity (in part because of a concern with psychophysical causation); but temporal contiguity he wisely retains. The exceptions are analyses which take seriously the reality of the causal connection in the singular case, often focussing on the notion that the connection is a necessary one.

There are two such analyses which deserve attention. One is the Armstrong-Tooley-Dretske view which grounds causal connection in a second-order relation between universals; thus $N(F, G)$, a relation of "necessitation" between being an *F* and being a *G*, grounds the production, by instantiators of *F*, of instances of *G*. Armstrong (on whose version of the view I shall focus) says little about what sort of temporal rela-

tion must obtain between an F and the G it produces. But Armstrong is a dedicated naturalist: for him, there are no states of affairs, or causal connections between them, outside of space and time.³³

Still, why shouldn't supernaturalists help themselves to the essential idea of the Armstrong-Tooley-Dretske analysis, developing it to suit their purposes? That is, if F is a divine attribute and G describes a mundane state of affairs, why shouldn't a connection N between them serve to underwrite theophysical causation? An initial resistance to this idea may come from the reflection that, if $N(F, G)$ grounds the law that all F 's are G 's, then God's operations would appear to be subject to natural law. Armstrong himself has wavered on whether, on his theory, a causal relation entails the existence of a law. In the end, he comes down on the positive side of this question.

But even if Armstrong is right (as I think he is) about this, why should not divine operations be in this way subject to natural law? After all, that is compatible with it's being up to God whether the connection $N(F, G)$ obtains (though - on pain of regress - he can't be said to *cause* this second-order state of affairs³⁴); and compatible with it's being God's free decision whether or not He exemplifies F .³⁵

So suppose God eternally exemplifies some property F - say, the property of commanding that spatiotemporal particular a exemplify G at time t . Then we can invoke Armstrong's connection N to explain what it is for these two states of affairs to be causally connected.

Unfortunately, there is a difficulty for this strategy: how is God to gain a "fix" on time t ? To do that, God would have to set up a temporal reference frame. We do this by observing clocks, sending signals to other observers, and the like. But all that presupposes causal interaction. Unless God has some informational contact with His world which allows Him to distinguish times, it is impossible to see how He can situate - or even *intend* to situate - a given sort of state of affairs at a given time. I do not see how such contact is to be made intelligible except by invoking causal connections. To say that God "directly apprehends" or "intuits" spatiotemporal objects or frames of reference, as some have, is just to wave one's hands. What is it for God to have such an "intuition"?³⁶

I shall return to the matter of a divinely established temporal reference frame; but first, let us examine the second sort of theory of causation to which an eternalist like Leftow might appeal. Both Leftow and Paul Helm³⁷ suggest that divine causation might be made intelligible in terms of a counterfactual analysis of causation. Leftow³⁸ gives this idea its most sophisticated development, adapting David Lewis' analysis of causation, *viz.*:

(CD) e is causally dependent on $c =$ *df.* were c to occur, e would occur (in symbols, $c \square \rightarrow e$), and were c to not occur, e would not occur.³⁹

Since Leftow is here considering what it is for God timelessly to sustain in existence a temporal being, he employs (CD) to formulate the fol-

lowing definition of a timeless sustaining relation:

(S*) *A* timelessly sustains *B* = df. (i) *A* and *B* occur contingently, (ii) *A* occurs timelessly, (iii) *B* occurs continuously over more than one temporal position, (iv) in every nonactual world *W* such that no world is more like the actual world than *W*, *A* occurs only if *B* occurs continuously over more than one temporal position, and (v) were *A* not to occur, then if *B*'s continuance is not overdetermined or redundantly caused, *B* would not do so.⁴⁰

Clauses (iv) and (v) spell out Lewis' analysis of the relevant counterfactuals, though, obviously, more must be done to eliminate the causal terms from (v) in favor of further counterfactuals.⁴¹ Is this strategy of Leftow's successful?

Whether it is so depends, in the first place, upon whether a counterfactual analysis of causation can be defended, a matter which, as Leftow concedes, remains to be decided.⁴² But in any case, the counterfactual analysis has a feature which may make theists uncomfortable. Because the truth conditions for counterfactuals are often vague, so also, on this analysis, will the truth-values of causal judgments be. Lewis accepts this consequence; but theists may be unwilling to allow that it's *vague* whether God is a cause of a given state of affairs or not. Suppose you believe that God created the best possible world, and you believe God did so because (among other things) He is perfectly good. Then (on Lewis' view) you believe that if God hadn't created this world, He'd have been less than perfect. But what are the truth conditions for that counterfactual? Do they, e.g., depend upon whether the divine command theory of ethics is true? Or perhaps, alternatively, you believe that if God hadn't created this world, this world wouldn't have been the best possible one - an equally hard claim to specify truth conditions for. In general: "God's commanding *x* causes *x* to occur" entails "If God hadn't commanded *x* then, other things being equal, *x* would have failed to occur." But what other things are being supposed to be equal? The indefiniteness of this affects counterfactuals of divine action, just as it affects more mundane counterfactuals.⁴³

Vagueness aside, there is a more serious problem in store for theists. It concerns what Lewis calls the problem of effects.⁴⁴ Suppose that *c* causes *e*, and that, under the circumstances, *c* was bound to cause *e*.⁴⁵ Then Lewis' analysis gives the unwanted result that *e* also causes *c*. Lewis blocks the inference by flatly denying the troublesome counterfactuals. He says,

If *e* had been absent, it is not that *c* would have been absent... Rather, *c* would have occurred just as it did but would have failed to cause *e*. It is less of a departure from actuality to get rid of *e* by holding *c* fixed and giving up some or other of the laws and circumstances in virtue of which *c* would not have failed to cause *e*, rather than to hold those laws and circumstances fixed and get rid of *e* by going back and abolishing its cause *c*.⁴⁶

We can see why theists can't accept this solution⁴⁷ by considering God's creation of the world. Suppose God's command "Let there be alpha" was the sufficient cause for the coming into existence of alpha (the world). Then since, if the world were to exist, God would have commanded it, and if it were to fail to exist, God would have failed to command it (i.e. since, according to theists, if the world had not existed, this could not involve the supposition that God commanded its existence but failed to bring it about), it appears to follow on Lewis' theory that the coming into existence of the world is a cause (indeed, *the* cause) of God's so commanding. Lewis blocks the inference by denying the last-mentioned counterfactual. But no theist could countenance such a denial; to do so would be to deny God's necessary omnipotence.

Leftow thinks he has another solution to the problem of effects. As he points out, clauses (ii) and (iii) of (S*) prevent cases of reverse dependence: a temporal being cannot timelessly sustain anything.

But alas, the salvation afforded by clauses (ii) and (iii) is illusory, for reasons analogous to those which defeat Stump and Kretzmann's appeal to the non-transitivity of ET-simultaneity. To see why, consider the relation *causes**, which I define as follows:

(C*) A causes* $B =_{df.}$ (i) A and B occur contingently, (ii) in every nonactual world W such that no world is more like the actual world than W , A occurs only if B occurs, and (iii) were A not to occur, then if B 's occurrence is not overdetermined or redundantly caused, B would not occur.

Plainly, causation*, as defined by (C*), is a genus of which timeless sustenance, as defined by (S*), is a species. If the latter relation exists, then (since it simply obeys fewer constraints), so does the former. But (C*) shows that the problem of effects is serious. For, in the sense defined by (C*) (which is after all essentially Lewis' definition), it will be true that the coming-to-be of the world caused God to command it.⁴⁸ The result generalizes, in fact, to all the effects of divine commands.

Leftow can perhaps deny that (C*) defines a causal relation, even if he allows that it defines *some* sort of relation. But such a denial could only be motivated, I think, by its dialectical advantages, not by any fundamental comprehension of causation. Consider, for example, the following near cousin of (C*):

(C**) A causes** $B =_{df.}$ (i) A and B occur contingently, (ii) A occurs temporally and B occurs timelessly, (iii) in every non-actual world W such that no world is more like the actual world than W , A occurs only if B occurs, and (iv) were A not to occur, then if B 's occurrence is not overdetermined or redundantly caused, then B would not do so.

(C**) defines what looks like a causal relation on the model of (S*), except that the causal direction goes from world to God. B might be God's hearing a petitionary prayer, in which case (C**) might seem an

acceptable definition in the spirit of (S*). But any willing contingently performed by God - e.g., His freely willing the creation of the world - will equally count as a substitution-instance for *B* in (C**). Like (S*), (C**) avoids the problem of effects, and in precisely the same way.

Leftow can't deny that (C**) has instances: as just noted, it applies to God's "creation" of the world. So he must deny - on some *a priori* grounds or general account of the metaphysics of causation - that (C**) defines a causal relation. But what grounds for that can he give? He thinks it just "intuitive" that temporal facts can't timelessly condition timeless ones. Of course I agree. But isn't it equally intuitive that a timeless fact, such as that $2+2=4$, can't causally condition anything at all?

Though I cannot claim to have covered here every conceivable analysis of causation by means of which theists might hope to escape the conclusion that an eternal God would, of necessity, be a do-nothing deity, it does seem to me that the prospects look quite unpromising.

2. Actions of a temporal God

I conclude that Gale and Pike are most likely correct in supposing that theists who locate God in eternity have an impotent deity on their hands. Indeed, troubles for divine causation do not end if God is returned to the temporal sphere. For God, it is almost universally supposed, is at least not a spatial being; and among theists it is also standardly held that God created the material world, and the space containing it, *ex nihilo*. But each of these claims - that God is a non-spatial being, and that matter can be brought into being from nothing that is itself spatiotemporal - is dubious and requires at least a considerable stretching of our ordinary conception of causality. But here intuitions waver, and it can be argued that our understanding of causation is not really deep enough, yet, to rule out decisively the envisioned possibilities.⁴⁹

Besides these difficulties, there is another which must be confronted by theists who hold that God is a temporal being who interacts causally with the world. Such interaction entails that information-bearing signals pass between God and the world; as a result, it must be possible to specify for God a temporal reference frame. How then is God's activity to be understood in terms of, or at least brought into conformity with, STR? According to STR, a spatiotemporal reference frame is determined by the nature of the causal interactions (signal transmissions) possible between items at rest in it and other items in the world. Because God does not have a spatial location, it is not possible to speak of his being "at rest" with respect to some set of spatial coordinates; nor can we speak literally of theophysical causal interactions in terms of signal transmission from one place to another. It is most natural, perhaps, to think of God as omnipresent; that is, locally present at (in the sense that He can immediately influence) every point in physical space. I do not think that this suggestion can be squared with both STR and other theistic commitments; however, that is not what I wish to discuss here. My present concern is with how God's actions are temporally coordinated with mundane clocks.

William Craig has argued that God endures through *absolute* time, defined by a temporal coordinate that is independent of local motion and that occupies a unique position with respect to the cosmos as a whole.⁵⁰ Craig's arguments for this thesis are two-pronged. On the one hand, he offers a metaphysical argument - he calls God's time metaphysical time, and distinguishes metaphysical from measured time. On the other hand, he appeals to recent physical measurements of the cosmic background radiation which suggest that an absolute reference frame, one which bears a unique relation to the cosmos, is empirically detectable.

If this latter claim proves to be correct, then it is plausible to identify God's time with the measured cosmic time. But Craig's first argument - the metaphysical one - cannot by itself bear the weight he places on it.

Craig's metaphysical argument consists in an attack upon what he takes to be the verificationist conceptual underpinnings of STR. Specifically, he takes Einstein's operational definition of simultaneity in terms of the constant one-way speed of light to reflect a commitment to the verificationist theory of *meaning*, i.e. to the view that to speak or think about absolute time is to lapse into meaninglessness. In view of his later explicit rejection of positivism, and in spite of some of his earlier phrasing and the evident influence of Mach, I find it doubtful that Einstein seriously meant to be making claims about what it is (literally) meaningful to say. Or perhaps his philosophical intuitions on this point were a bit muddled. But no matter: a defense of Einstein's "definition" of simultaneity can be given which makes no specious appeal to verificationist notions of meaning, but which does capture Einstein's basic insight and reflects scientific practice in general.

Such a defense proceeds, not by appeal to any semantic principle, but to one which coordinates epistemology with ontology. I shall call it the Principle of Causal Closure. The basic idea is that we can (in principle) detect (or measure) all and only those items which causally interact with some part of "our world," and that it is only such things that can make any difference to what our world is like. The rough idea needs to be more carefully articulated. It consists of two theses. One is that the world (our world) consists solely of parts that are causally connected or causally connectable; i.e., that nothing which is causally isolated from every part of our world - the set of items to which *we* are or can be causally related - is part of our world. We can take this simply to stipulatively define what is meant by "our world." But it has an important consequence. Given the transitivity of the causal relation, it follows from the fact that *e* is or could be causally related to something in our world, that it is or could be causally related to us. Concretely: if *e* interacts with something in the world, we can in principle get it to interact with us, hence we can in principle detect or measure it. Conversely: If we can't detect or measure *e*, then it bears no causal relation to anything in our world.⁵¹

We cannot know about any physical thing that we cannot detect or measure. But the result just obtained entails that such a thing would be causally isolated from our world. What we can't know about, it is not

the business of science to pursue. But that is no loss to science: what is causally isolated from our world can make no difference to it whatever. It does not affect the operation of our world, either as a boundary condition or as a phenomenon that the laws governing our world must account for. From the perspective of physics and of our world, it is a nothing.⁵² This is the second thesis. There may be universes not causally connected to ours. There may be such a small universe three inches in front of my nose right now. But these worlds are not our worlds. Our measuring techniques cannot penetrate them, and their existence makes no difference to the things we can measure.

What I've said about events goes, by way of a corollary, for the properties they instantiate as well. A property or relation, instances of which are not detectable by physical means, is a property that plays no causal role in the world's economy. Thus, in particular, a type of temporal "simultaneity" which is not measurable is not a relation that can play any role in physics, because it is not a relation which affects the physical events in our world, if they stand in it. If, then, God stands in *causal* relations to mundane events, the simultaneity relations between events in His temporal reference frame and any given mundane frame of reference must be determinable in terms of the transmission of these theophysical "signals." So if God's actions have physically specifiable effects upon our world, it must be possible to bring God's "metaphysical" time into (temporal) relation with mundane temporal frames. A temporal God whose time is not thus relatable to mundane times is a nothing to us. Einstein's basic insight stands.

On the other hand, if divine time *is* measurable by us - as it would be if it could be identified with or correlated to a frame defined by the cosmic background radiation - then there is no impediment here to the theistic hypothesis of a God who is causally active in this world. So let us allow that a temporal God, endowed with the other characteristics theists take Him to have, is capable of the sorts of actions typically attributed to Him.

3. Science and God

It was not, after all, my plan to show that God is impotent, but rather to investigate the conditions under which one could defend the claim that He is beyond the reach of scientific investigation. And I have been suggesting that, if God is eternal, and if an eternal being cannot causally interact with the world, this would certainly render Him immune from scientific investigation. It is easy to see that it would, indeed, so isolate God from human cognitive faculties as to make impossible *any* knowledge of Him, of an *a posteriori* kind.⁵³ If, on this supposition, there is any knowledge of God to be had, it must be sought in *a priori* reasoning alone.

But there remains the other prong of the question: if God can and does⁵⁴ causally interact with the world, might there be some way of defending the claim that He nevertheless lies outside of the domain of scientific understanding?

One way to achieve this result would be simply to rule that the prop-

er subject matter for scientific inquiry is limited to the spatiotemporal world. But why should science accept such an arbitrary stipulation concerning the boundaries of its domain? There is an alternative - and in this context less tendentious - characterization of the field proper to scientific inquiry, *viz.*, that the challenge to which it addresses itself includes (at least⁵⁵) the task of discovering what causes what.

It has always been central to the mission of science to seek as complete and comprehensive an understanding of the causal structure of things as it is possible to achieve. Although science does more than seek to provide causal explanations, that, surely, is *one* of its tasks. If some natural phenomenon is supernaturally caused, it would be an unacceptable and arbitrary limitation on scientific inquiry (unless it can be shown that there are features intrinsic to the relevant scientific methods - *i.e.*, to any method that is demonstrably reliable in discovering causes - and to the supernatural itself, which preclude in principle such an investigation) to slam the door shut here and say: you can go no further.

Of course, it might be that non-spatiotemporal entities can't cause, or be causally affected by, anything; in which case the alternative characterization I've offered assigns to science no larger a domain than does the first one. But in that case, we are returned to the first prong of the question. If God interacts with the world, then science must be permitted to ask what causes the observed effects of His activity.

To fix ideas, suppose that every Saturday at sunrise, God were to move Mt. Ararat ten kilometers to the east and at sunrise on every Sunday, to return it to its original location. We may be sure that geologists would waste no time studying the phenomenon. But all attempts to trace a chain of purely natural causes would, in this case, end in failure. Why then should the hypothesis of a supernatural cause be debarred from consideration?

It might be thought that such a hypothesis must be excluded because science can't manipulate or control supernatural causes. But scientific understanding is certainly possible where manipulation is beyond our reach. There are a great many natural phenomena into which we possess scientific insight, over which we have no control.

Or it might be supposed that science must confine itself to causes that can be directly observed, or observed by the bodily senses, whereas the divine cannot be so observed. But this brand of empiricism not only fails to respect the way scientists typically understand the theoretical dimensions of their enterprise; it also runs aground upon the task of specifying what it is to observe something "directly" (as opposed - presumably - to obtaining evidence for it via its effects). Nothing is more natural in science than entertaining hypotheses concerning "unobservable" entities, and reasoning from effects to causes. Thus to exclude supernatural hypotheses on this ground would be to reject perhaps the most fundamental inferential procedure in science - abductive reasoning.⁵⁶

Third, it might be suggested that God cannot be subjected to scientific scrutiny because, as master of the universe, he is not subject to the laws of nature. But that does not prevent God from acting in conformity with the laws of nature. God could not literally *violate* the laws of nature,⁵⁷

though He could make a world that does not always behave in patterned ways. Such a world might be harder to study scientifically, but if causes operate in that world, they would be proper topics of scientific inquiry.

Finally, it might be thought that it would be unsound methodology for science to admit supernaturalistic hypotheses. As Stephen Weinberg puts it,

. . . the only way that any sort of science can proceed is to assume that there is no divine intervention and to see how far one can get with this assumption.⁵⁸

This is a more cogent worry, for there are certain methodological dangers lurking here. They are, however, dangers of practice rather than of principle, and at most what they show is that we should try *very hard* to discover naturalistic explanations for a phenomenon, before entertaining seriously any supernaturalistic hypothesis.

The principle danger which arises in this connection is that of allowing into science a god-of-the-gaps strategy, a strategy which would permit adoption of a supernaturalistic explanation for a phenomenon when no presently available naturalistic hypothesis seems satisfactory, but where the supernaturalistic hypothesis has not itself received any positive independent confirmation. Supernaturalistic explanations are sometimes offered which are too vague, or too sketchy about the details of the operative mechanisms, to permit their being tested. Perhaps this is why Weinberg thinks of theistic hypotheses as (at best) a last resort. But there is no reason why supernaturalistic explanations should not be held to the same standards as other causal explanations, and no reason in principle, so far as I can see, why they could not be so developed as to meet those standards.⁵⁹

There is, nevertheless, an important tradition in twentieth-century theology⁶⁰ which largely eschews - even rejects - natural theology on the grounds that any proof of God's existence would coerce belief and leave no room for a freely chosen faith. According to this view, God offers humans a few carefully chosen hints of His presence, but makes sure to leave no traces which are sufficiently unmistakable to encroach upon the domain of faith.

I believe this position to be founded upon distorted and mistaken conceptions of both belief and freedom; but it does raise a theoretical possibility that is nevertheless worth consideration. God is so vastly more clever and powerful than we are that, were it for whatever reason to suit His purposes to follow a policy of dangling obscure hints before human beings, or of working in complete secrecy, and never revealing His presence in a way open to scientific scrutiny, then surely He would be able to carry that policy out. Science - our science - is a human enterprise, and whatever its power in theory, it is limited after all by the limits of human intelligence and physical resources, lucky observations, and the like. God could remain hidden, though all the while interacting with the world in a multitude of ways.

There is no denying that a hidden God is a genuine possibility. If remaining beyond the reach of science is God's policy, then no doubt we shall indeed fail in any scientific effort to track Him down. But then, we shall fail to have any knowledge of God, period. Faith, understood as a strong confidence⁶¹ not supported by good evidence, may arguably serve as a religiously satisfactory substitute, but it is in no sense cognitively or epistemically able to replace knowledge.

So long as God chooses to remain hidden, we shall remain in ignorance. To the extent that He reveals himself, on the other hand, we may obtain some justification for beliefs about His existence and activities. In either case, it is perfectly open to science to pursue the issue, by every means at its disposal.

I think we can go a bit further. One need not be guilty of worshipping science, or of a misplaced confidence that science can solve every problem and answer every question, to recognize the hardly controversial fact that the various disciplines within science have collectively developed and applied, with a degree of sophistication, precision, and success elsewhere unmatched, a set of tools designed to ferret out causes and effects. It is only through His discoverable effects upon us and our world that we can gain knowledge of God. Thus it is to science that we should turn for the best answers to theological questions. If science cannot supply those answers, what can?^{62,63}

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NOTES

1. "Impeaching a Self-Appointed Judge," (Review of Phillip E. Johnson's, *Darwin on Trial*), *Scientific American* 267, No. 1 (1992), p. 119.

2. It is worth remembering that the problematic set by science for Kierkegaard and other 19th century theologians came not only from the natural and biological sciences, but (following Hume) from reflection on the possibility of explaining the phenomenon of religion itself scientifically; and from the application of historiographical methods to the Bible.

3. I take it that the relation between the theoretical enterprises - science and theology - and the phenomena, is, in part, explanatory in the one direction, and evidential in the other. To the extent that these are reciprocal, theology, in abandoning the explanation of mundane phenomena to science, faces the danger of foregoing empirical confirmation. Liberal theology, indeed, has tended to renounce the evidential approaches to theology entirely.

4. But this skepticism is somewhat differently motivated, usually owing much to Calvin's view that human cognitive faculties were too severely impaired by original sin to provide reliable guides in our search for knowledge of God. Nor do all conservatives share this skepticism - William Craig, e.g., does not.

5. Plantinga puts it thus in "When Faith and Reason Clash: Evolution and the Bible," *Christian Scholar's Review* 21 (1991), p. 30:

There is indeed a battle between the Christian community and the forces of unbelief. . . . important cultural forces such as science

are not neutral with respect to this conflict. . . It is of the first importance that we discern in detail just *how* contemporary science . . . is involved in the struggle. . . . we can't automatically take the word of the experts, because their word might be dead wrong from a Christian standpoint.

Finally, in all academic endeavor, we Christians must think about the matter at hand from a Christian perspective; we need Theistic Science.

6. I am claiming here simply that if a scientific theory *T* conflicts with a theological doctrine *D*, then any empirical evidence which favors *T* and does not also favor *D*, or favors it less strongly than *T*, disconfirms *D*. Even with this concession, there is a way to insulate theology from "mainstream" science. It is to adopt a strong form of epistemic relativism, and then to set up a "Christian paradigm" which is epistemically isolated from the "naturalistic paradigm."

7. For the views of Reformed epistemologists on this, see Alvin Plantinga and Nicholas Wolterstorff, eds., *Faith and Rationality: Reason and Belief in God*, Notre Dame: University of Notre Dame Press, 1983. See also William Alston, *Perceiving God*, Ithaca: Cornell University Press, 1991, William Wainwright, *Mysticism*, Madison: University of Wisconsin Press, 1981, and Nelson Pike, *Mystic Union: An Essay in the Phenomenology of Mysticism*, Ithaca: Cornell University Press, 1992.

8. With respect to every religious tradition of which I am aware that posits supernatural agents, it is uniformly true that these agents are held to interact with the world.

9. Thus, even Descartes' two proofs for God's existence in the Third Meditation would be ruled out.

10. Furthermore, creation *ex nihilo* is an especially problematic application of our concept of a cause.

11. Another possibility, to be sure, is that a causal chain originates in a natural event which has no (sufficient) cause. Then the question becomes whether the no-cause hypothesis can be better confirmed than the supernatural-cause one. Here (simplifying in various ways) I think we should be good Bayesians, comparing the two hypotheses on the basis of their prior probability and predictive power. See also note 59.

12. See Gale, *On the Nature and Existence of God*, New York: Cambridge University Press, 1991, pp. 53-54, and Pike, *God and Timelessness*, New York: Schocken Books, Chapter 6.

13. Stump and Kretzmann, "Eternity," *Journal of Philosophy* 78 (1981), pp. 429-458, "Absolute Simplicity," *Faith and Philosophy* 2 (1985), pp. 353-382, "Atemporal Duration: A Reply to Fitzgerald," *Journal of Philosophy* 84 (1987), pp. 214-219, and "Eternity, Awareness, and Action," *Faith and Philosophy* 9 (1992), pp. 463-482.

14. See Stump and Kretzmann, "Eternity," sec. V, where they say: "We want now to turn to fundamental difficulties in theological applications of the concept [of divine eternity], particularly those which arise in considering the possibility of interaction between eternal and temporal entities." (p. 447) Moreover, they go on to suggest, not merely that the notion of divine-temporal interaction is not incoherent, but that their notion of ET-simultaneity - to be discussed below - plays a crucial role in understanding how it in fact occurs. Thus they say, "If ET-simultaneity is a sufficient condition for the possibility of a causal connection in the case of God's bringing about the existence of a temporal entity, it is likewise sufficient for the possibility of

his acting because of a prayer prayed at a particular time." (p. 451) Here, "the possibility of [God's] acting" is presumably meant to affirm, not merely the bare logical possibility or intelligibility of divine action, but that such actions do occur, in the manner described, provided that God wills them.

15. This notion of a partless duration has come in for a good deal of criticism - see Paul Fitzgerald, "Stump and Kretzmann on Time and Eternity," *Journal of Philosophy* 82 (1985), pp. 260-269, Herbert J. Nelson, "Time(s), Eternity, and Duration," *International Journal for Philosophy of Religion* 22 (1987), pp. 3-19, and Brian Leftow, *Time and Eternity*, Ithaca: Cornell University Press, 1991, Chapter 6; but it isn't my primary target here.

16. Stump and Kretzmann, "Eternity," p. 439.

17. Leftow, *op. cit.*, pp. 172-178 recognizes and develops this difficulty. The point might be clarified by observing that the rationale which supports the Lorentz transformations in STR does not merely give rise to the idea that simultaneity is a three-place, as opposed to a two-place, relation. That rationale turns fundamentally on the precise *nature* of the interactions causally possible between distant observers, and hence upon the laws of signal transmission. In fact, in the limiting case in which the speed of transmission is permitted to be infinite, the simultaneity relation effectively reduces to a two-place relation, which shows that the number of places the relation takes is parasitic upon, and less basic than, the causal laws governing signal transmission. So, just as Einstein's reasoning required independent assumptions concerning the causal processes governing electromagnetic phenomena, Stump and Kretzmann would have to make independent assumptions about the processes governing signal transmission between an eternal reference frame and a temporal one, for the reasoning supporting the notion of ET-simultaneity remotely to resemble that which generates STR.

One could, conceivably, propose a causal theory of time/eternity according to which causation is the more fundamental notion ontologically. The possibility of theophysical causal relations would then perhaps not hinge upon temporal considerations at all; and temporal or quasi-temporal relations between eternity and the world could then ride piggy-back upon the causal relations. But that is not Stump and Kretzmann's procedure; and I have no idea how it would go. (But see further note 36).

18. Stump and Kretzmann, "Eternity, Awareness, and Action," pp. 477-478. I have omitted from (ii) and (iii) a clause concerning the immediate awareness *A* and *B* can have, if conscious, of *x* and *y*.

19. Stump and Kretzmann, "Eternity, Awareness, and Action," p. 475.

20. Brian Leftow, *Time and Eternity*, Ithaca: Cornell University Press, (1991).

21. Leftow, *op. cit.*, p. 222.

22. Leftow, *op. cit.*, p. 227.

23. William Craig disputes this inference of Leftow's in "The Special Theory of Relativity and Theories of Divine Eternity," *Faith and Philosophy* 11 (1994), pp. 19-37.

24. Craig, *Ibid.*, largely relieves me of this task; readers are referred to his article. Leftow does not comment on the modal status of (M), given Minkowskian space-time. But it seems there could be change without motion in a Minkowskian world, even if (M) happens to be true in the actual world.

25. Craig, *Ibid.* also makes this point.

26. Yet Leftow, *op. cit.*, p. 225 actually accepts such bizarre conclusions as that three, and the color yellow, are contiguous to every spatial location.

27. 'Is not subject to affective states' doesn't denote an emotional charac-

teristic; equally, 'is not distant from anything' doesn't denote a spatial relation. Leftow himself uses a similar argument against Stump and Kretzmann at Leftow, *op. cit.*, p. 175.

28. Leftow, *op. cit.*, p. 226.

29. Leftow, *op. cit.*, p. 245.

30. Leftow, *op. cit.*, pp. 291-292.

31. An anonymous referee has suggested on Leftow's behalf that, even given the Zero Thesis, perhaps it can be denied that God's actions are locally simultaneous with spatiotemporal events, thereby blocking the move from divine actions' being simultaneous in the eternal frame of reference to their effects' being simultaneous in temporal reference-frames. But for Leftow to argue thus would simply reinforce the charge that his use of (ZT) requires an equivocation on whether the negation is internal or external.

32. A small sampler of excluded analyses includes those of Kant, C. J. Ducasse, *Nature, Mind, and Death*, LaSalle: Open Court, 1951, Wesley Salmon, *Scientific Explanation and the Causal Structure of the World*, Princeton: Princeton University Press, 1984, and J. L. Mackie, *The Cement of the Universe: A Study of Causation*, Oxford: Clarendon Press, 1980.

33. But see, e.g., David Armstrong, *A Theory of Universals*, Cambridge: Cambridge University Press, 1978, pp. 153-154. Interestingly, Armstrong slips a couple of pages later (p. 156) when, apparently ignoring the fact that God is nonspatial, he reflects upon the intelligibility of miracles in terms of his analysis of causation. But he is quite right to think that his analysis has promise at least as a way of understanding the actions of a temporal God.

34. Indeed here lurks the problem of explaining divine sovereignty over the laws of nature. But let us set aside that puzzle.

35. This theme clearly requires further development, which I shall attempt elsewhere.

36. A referee has suggested that God need not fix reference on times, provided that a causal theory of time is true. All He needs to do in that case is timelessly to will a causal sequence of events, whose causal relations will then ground their temporal relations. For a deist, this might be a viable way to conceive of divine causation. For a theist, at least one who is also a libertarian with respect to human action, it is less clear to me how it would succeed. That depends upon whether God can locate in the causal order free human actions, which are arguably not a part of that order, so as to respond to them.

In any case, there appears to be a more fundamental difficulty with this strategy. A causal theorist might accept a B-theory of time, and ground the *earlier/later-than* relation in the *cause/effect* relation. Alternatively, one could adopt an A-theory of time and a non-Humean analysis of causation, grounding temporal *becoming* in causal *production*. In the first case, it will then turn out that God's causing a mundane event-sequence by willing it entails that this sequence occurs later than God's willing. The second sort of theory, on the other hand, establishes a relation of temporal becoming between divine acts of willing and their effects. Thus both theories imply temporal relations between divine acts and spatiotemporal events, and so neither is acceptable to the position that God is eternal.

37. Helm, *Eternal God: A Study of God Without Time*, Oxford: Clarendon Press, 1988, p. 68.

38. Leftow, *op. cit.*, pp. 291-295.

39. Leftow, *op. cit.*, p. 293, following David Lewis, "Causation," in Lewis, *Philosophical Papers*, Vol. II, New York: Oxford University Press, 1986, pp. 166-167.

40. Leftow, *op. cit.*, p. 294.

41. See the sections 'Preemption' and 'Redundant Causation' in Lewis, *op. cit.* What Leftow calls redundant causation, Lewis calls preemption; Lewis uses 'redundant causation' as a generic term that covers both preemption and overdetermination. Lewis' analysis of preemption invokes a move that he employs also to solve the problem of effects - for which see below - a move which Leftow must reject. So Leftow owes us an alternative counterfactual analysis. To be sure, it is unclear just how thoroughgoing a commitment to a Lewis-style analysis of causation Leftow wishes to embrace. He says that "if some counterfactual analysis of causation can be adequate, then (S*) either is or can with further complications develop into a viable analysis of a timeless being's sustaining causation of a temporal being's existence." (*op. cit.*, p. 294) Now this is a conditional claim - but if Leftow rejects Lewis' analysis, then we would need to be informed what analysis of ordinary temporal causation he has to offer.

42. For a recent criticism of Lewis, see Daniel M. Hausman, "Causation and Counterfactual Dependence Reconsidered," *Nous* 30 (1996), pp. 55-74.

43. Lest it be thought that the argument trades on the problematic modal status of the antecedents and consequents of this example, I give here several other examples. (1) 'Abraham's argument caused God to spare Lot' might be understood in terms of 'If Abraham hadn't so argued, Lot would not have been saved by God.' (Here the causal direction is from world to God.) How is the counterfactual to be evaluated? If Abraham had remained silent, would God have carried out his expressed intention to slay every Sodomite? Or would God, foreseeing Abraham's silence and recognizing the injustice of murdering Lot, never have declared, let alone executed, such an intention? (2) 'God the Son's appearing to Paul on the road to Damascus caused Paul to become a Christian' might be analyzed as, 'If God the Son had not appeared to Paul on the road to Damascus, Paul would not have converted.' But what exactly are the conditions under which this counterfactual is to be evaluated? (3) Or, even more dramatically, consider the claim that 'God the Son's appearing to Paul caused Christianity to become a world religion' which might be analyzed as 'If God the Son had not appeared to Paul, Christianity would never have become a world religion' (and which, together with certain historical facts, supports the plausible claim that Christianity would have remained a minor Judean sect, persevering less than 150 years). It should be clear that in all these cases, it is not clear whether the counterfactual is true or false, because it is unclear what ancillary conditions are to be "held fixed" when it is evaluated.

44. See Lewis, *op. cit.*, p. 170.

45. That is, suppose that, given the circumstances, ($c \square \rightarrow e$), from which it apparently follows that ($\sim e \square \rightarrow \sim c$).

46. Lewis, *op. cit.*, p. 170.

47. Or a close analogue, depending on whether or not one takes there to be a nomic connection between God's commands and their effects.

48. Since Lewis' own defensive strategy is unavailable to the theist.

49. Stump and Kretzmann think that a theist who allows that non-spatial God can be metaphysically present to spatial beings ought equally to allow that eternal God can be metaphysically present to temporal beings; see "Eternity, Awareness, and Action," p. 476). But if metaphysical presence involves causal connectedness, it is unclear that the two cases are parallel.

50. Craig, "God and Real Time," *Religious Studies* 26 (1990), pp. 335-359.

51. Causal connectedness in the sense meant here can be highly indirect. Our world consists of things which can causally influence us and our mea-

asuring instruments, things which we can causally influence, and things to which we are or can become connected via a causal fork - that is to say, events whose causal antecedents can be traced back to some event which is a causal ancestor of something which affects or can affect us. When I speak of what we can or cannot do in this context, I mean what is physically possible or impossible for us - i.e., consistent with, or inconsistent with, the laws of nature.

52. This principle is not to be confused with a stronger principle, one we might call the Principle of Causal Parsimony. The stronger principle is an ontological one. It says that there do not *exist* any entities or events which are in principle undetectable, because causally isolated from our world. This is not a trivial principle: it conflicts, for example, with David Lewis' realist attitude toward possible worlds. I know of no way to demonstrate this stronger principle. It is not a meaningless assertion that there are such entities or events, though I do think that individuation and singular reference to items of this kind are precluded.

53. It would also evacuate theism of most of its religious and metaphysical interest.

54. I take it that if God *can* interact with the world but doesn't, then we are effectively in the same cognitive position vis à vis Him as we are if He can't interact. But I also take it that no theist would accept the view that theophysical causation is possible but not actual.

55. Science may well include tasks other than those of tracing the web of causal interactions and patterns which "cement" together our universe, and of providing causal explanations. But it includes *at least* these undertakings.

56. Whatever opinion one may have of the strengths or weaknesses of the *a posteriori* arguments for the existence of God, they all trade on precisely this form of inference.

57. God could not make it the case both that all *A*'s are *B*'s, and that some *A* is a non-*B*.

58. Weinberg, *Dreams of a Final Theory*, New York: Pantheon Books, 1992, p. 247.

59. What kind of evidence would support scientific reasoning to the conclusion that a divine action upon or interaction with the world has occurred? It is not my task here to specify what such evidence would be, or even to argue that there could be such evidence, but only to argue that if the evidence exists, our primary appeal should be to science to evaluate it. But I see no reason to think that nothing could count as evidence of the right sort. In "On Miracles," *American Philosophical Quarterly* 5 (1968), pp. 130-134, Paul Deitl has given a vivid depiction of one imaginable case. I discuss the question whether mystical experiences can provide evidence of this sort in Fales, "Scientific Explanations of Mystical Experience, Part I: The Case of St. Teresa," and "Scientific Explanations of Mystical Experience, Part II: The Challenge to Theism," *Religious Studies* 32 (1996), pp. 143-163 and 297-313 respectively; and in "Mystical Experience as Evidence," *International Journal for Philosophy of Religion* 40, (1996), pp. 19-46. But I reach the conclusion that such experiences provide at best extremely weak evidence for theism. In general, I endorse what I take to be the central point of Hume's discussion of miracles - namely, that a theistic explanation of an event is plausible to the degree that it outstrips all non-theistic explanations. Thus, an event - e.g., the translocation of Mt. Ararat - may even be an unlikely thing for God to do, and yet confirm theism, provided no other (equally good) explanation for its occurrence can be found.

One critic has suggested that I should speak here of rational grounds

rather than *scientific* grounds for theism, since science concerns itself only with natural phenomena. There is the danger here of a quibble over words. I would merely observe that this sort of investigation, at its best, would use scientific methods of data collection and evaluation, and scientific reasoning to confirm or disconfirm any adequately articulated theistic hypothesis. In view of this, I see no reason not to call the inquiry a scientific one. I might add that although in principle nothing much hangs on our terminology here, there are practical implications that cannot be ignored: scientists all too often, all too conveniently, and sometimes disingenuously abdicate the responsibility to investigate such matters, or to draw out the implications of their scientific work for theism, citing the shibboleth that on these questions science must remain silent. They should not be let off the hook so easily.

60. Principally among liberal Protestant theologians. Its roots can be traced to the influence of Kierkegaard.

61. Here I mean confidence that some proposition is true.

62. In the Middle Ages, theology was considered to be the queen of the sciences. I suggest that in our age, this adage needs to be inverted. In the search for theological understanding, science is queen. There is more to theology than grasping the relevant natural and supernatural facts; but without a grasp of those facts, there is no *logos* of the *theos* at all.

63. I would like to thank Brian Leftow, William Craig, and two anonymous referees for their very helpful comments. They have saved me from several errors.