The Existence of God

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The so-called "cosmological argument" (as it was first labeled by Immanuel Kant) has played a central role within Aristotelian philosophy from the very beginning. In fact, we find first-cause arguments before Aristotle: most importantly, in Plato's The Laws, Book X. The inference to the existence of a god or gods is central to Aristotle's two most important works in metaphysics, Physics and Metaphysics. The Neo-Platonists (including Plotinus and Proclus), who saw themselves as building on Aristotle's foundations, made this argument fundamental to their understanding of reality.

Many of the ancient critics of Aristotle, such as John Philoponus, the Kalaam tradition (al-Kindi, al-Ghazzali), and Bonaventure, drew heavily from Aristotle in their philosophizing, and here too the cosmological argument took central stage. Finally, this argument continued to influence modern philosophy, in both its rationalist (Descartes, Spinoza, Leibniz, the pre-critical Kant) and empiricist (Locke, Samuel Clarke) varieties. This continuity demonstrates that modern philosophy retained more Aristotelian elements than is often recognized.

No revival of the Aristotelian tradition in metaphysics can afford to ignore the question of the viability of first-cause arguments. In fact, there has been a flourishing of first-cause argumentation within analytic metaphysics in the last fifteen years, a development with parallels in other branches of the field.

 In the first section below, I deal with some preliminary issues about the form of the argument. I take on the most important question, that of justifying some form of a causal principle or 'principle of sufficient reason', in section II. Next, I consider (in section III) the dual problems of avoiding an infinite regress and providing a principled ground for stopping that regress with God and not before. This section comprises six different approaches: the Kalaam argument, al-Farabi's aggregation argument, a version formulated in terms of George Boolos's plural logic, Aquinas's appeal to per se causation, and Leibniz's use of infinitary conjunction. I turn in section IV to a variety of arguments for a supernatural cause of the universe that do not rely on a global causal principle to reach their conclusion but instead appeal to inference to the best explanation. These arguments include an interpretation of Aquinas's First Way (seeking an explanation of the perpetuation of time), a Neo-Platonic argument from the spatial or spatiotemporal unity of the world, a Maimonidean argument (Aquinas's Third Way) for the need for a necessary explanation for an infinite past, and Kant's pre-critical argument for God as the ground of necessity. Finally, section V addresses the problem of moving from a first cause to God (as classically conceived).

I. Preliminary issues

Here is the general form of the cosmological or first-cause argument:

1. There are things of a certain kind F such that everything of that kind has a cause or explanation.
2. There must be an ultimate cause or explanation of each of these things.
3. Such an ultimate cause must be God.
4. Therefore, God exists.

The argument has just three premises. A defense of the argument must therefore tackle three problems:

1. The Justification Problem. What justifies the causal or explanatory principle appealed to in premise 1?
2. The Regress Problem. Why must the chain of explanations terminate?
3. The Gap Problem. What justifies identifying a first cause with God?

I will take up the Justification Problem in the next section (II), the Regress Problem in section III, and the Gap Problem in section V, after considering some variations that do not fit the general template in section IV.

Before proceeding with this three-part defense, there are a number of preliminary questions to ask about this argument. First, we can ask what sort of causal or explanatory relation is involved. This question is inseparable from the question of what kind of 'things' are in question here: what are the relata of the causal or explanatory relation?

Second, we can ask about the relation between causation and time: are the causes and explanations supposed to precede their effects in time, or are we looking for some kind of synchronic or timeless explanation?

Third, what sort of kind is F? In particular, should we identify F with the property of existing contingently? Can necessary beings be caused or explained?

Finally, I will turn in this section to the question of the logic of argument: is it supposed to be deductive or inductive? If inductive, what sort: defeasible inference, inference to the best explanation?

A. The Explanatory Relation and its Relata

Throughout the latter part of the twentieth century, philosophers have been arguing about whether the fundamental causal relation is between things (events, conditions, existing entities) or truths (propositions, facts). In the 1960's and 70's, the consensus favored the primacy of truths. Causal explanation was supposed to be

some kind of relation between true propositions, analogous to logical connectives like 'or' or 'not'. The fundamental causal facts were supposed to take the form: q, because p. This propositional-connective model fits best with cosmological arguments that appeal to Leibniz's "Principle of Sufficient Reason": the principle that every contingent truth has some adequate explanation in terms of other, more fundamental truths, bottoming out in a foundation of necessary truths.

However, the latter part of the twentieth century has seen a resurgence of the competing model: causation as fundamentally a connection or tie between things (like events, states, or other spatiotemporally located entities). This model corresponds to cosmological arguments that appeal to a causal principle of the form: contingent (or wholly contingent) things must be caused by other, separate things, with some necessarily existing things providing the ultimate causes.

The two models are not completely unrelated. If we start with the real-connection model, we can say what it is to explain certain kinds of contingent truth. If C was the cause of E, then the truth that E existed or occurred is explained by the truth that C existed or occurred. Alternatively, if we start with the propositional-connective model, then we can use that model to build an account of causal connections, so long was we suppose that each contingent truth is 'made true' by some concrete entity or arrangement of entities. If it is the case that q because p, and if e(p) and e(q) are the 'truthmakers' of p and q, respectively, then it should follow that e(p) is a cause of e(q). In the case in which p and q are each of the form: 'x exists', for some x, this truthmaker account is quite plausible. A truth of the form 'x exists' is always made true by x itself.

The principal difference between the two models will emerge when we consider how to block the regress. For those adopting the propositional-connective model and Leibniz's Principle of Sufficient Reason, the most attractive approach will be that followed by Richard Gale and Alexander Pruss: using the logical operation of conjunction to form the One Big Conjunctive Truth, and then apply the PSR to that, resulting in a necessary truth as its explanation. Those adopting the real-connection model and a global Causal Principle, have a number of alternative ways of achieving the same result, including aggregation, plural quantification, and more direct arguments against the possibility of infinite regresses.

The Aristotelian tradition contributes several crucial insights to this problem, without finally deciding the issue. First, we can say that only the actual can be a cause or ground a causal explanation. The merely possible or potential (as such) causes nothing. Second, the primary or focal sense of causation applies to causes and effects that are positive: to the existence of things, or to their being a certain way (their "accidents"). If privations or negations have causes at all, it is in only a derivative sense. Third, a cause must take the form of a powerful particular: a particular, concrete substance with an appropriate active power. The effect is constituted by the exercise of this active power. Whether an active power exists and

can be exercised on a particular occasion depends upon the intrinsic nature of the agent and on its external circumstances. In the case of rational agents, the potential exercise of an active power depends on the agent's having some reason for doing so. If there are adequate reasons for contrary actions on a given occasion, rational agency can introduce an element of contingency.

B. Diachronic vs. Synchronic Causation

Another crucial issue concerns the relation between causation and time. In some cases, it seems that the cause must precede its effect in time. This would hold in every case of continuous causation. Where a substance or group of substances is undergoing some continuous process or activity (such as locomotion, e.g., the revolution of the earth around the sun), the earlier phases of the activity are in some sense causes of the later phases.

In other cases, causation would seem to be simultaneous. When one substance acts upon another, the cause and effect are simultaneous, since the effect is identical with the exercise of the agent's active power, and a power can be exercised only while it exists. The two modes of causation are intertwined: it is continuous causation that explains why instances of discrete causation occur when they do. Consider, for example, the continuous motion of two billiard balls toward one another, culminating in the discrete interaction that occurs when they collide. The collision, in turn, gives rise to new processes of locomotion. A diachronic chain of such alternating continuous and discrete causation could regress arbitrarily far into the past.

This twofold account of causation gives rise to three different kinds of cosmological argument: (1) those that argue that such a diachronic regress cannot extend infinitely far into the past, (2) those that argue that no act of discrete causation can be fully explained by continuous action in the past, but requires some further synchronic cause in the moment of action, and (3) those that seek to disentangle causation from time altogether, moving ultimately to a timeless cause of the whole cosmos of finite things, regardless of whether its past is finite or infinite in extent.

C. Necessary vs. Uncaused

What sorts of things call for or require a cause? One traditional answer is: contingent things, things that could have failed to exist or occur. Successful cosmological arguments of this kind reach one or more necessary being as the First Cause.

However, one might argue (as does Thomas Aquinas in the Third Way) that such an argument is not sufficiently ambitious. Arguably, proponents of such argument overlook the possibility that some necessary beings might also require a cause. Some necessary beings might be necessary in a dependent way: through or by the

necessity of something else. For example, suppose that God gives rise to universal ideas through a process of thinking. If both God and God's thinking are necessary beings, then the ideas would also be necessary and yet causally dependent.

It won't do to adopt as our principle the rule that all dependent things have causes, if 'dependent' is understood as meaning simply 'caused', since such a principle would be a mere tautology. More promising would be this: to propose that everything that could possibly have a cause actually do so. Only a thing necessary in itself would be absolutely uncausable.

D. Deductive vs. Inductive

Finally, we need to consider the form of the cosmological argument: is it supposed to be deductively valid, or is it some form of inductive? If inductive, what kind of argument: abductive (inference to the best explanation), Bayesian, or appeal to a defeasible generalization? Since the time of the Continental Rationalists, it has been taken for granted that the cosmological argument is supposed to be deductive in form, relying on an exceptionless causal principle. This reflected the obsession with certainty that characterized the early modern period. However, we should be on guard against anachronistically reading this epistemological anxiety back into the earlier tradition.

If the inference to the First Cause is taken to be an inference to the best explanation, or to be the result of applying a defeasible, ceteris paribus or "ceteris absentibus" (other things being absent) kind of principle, then the burden of justifying the casual principle or causal inference is considerably lightened. Although an agnostic might legitimately object to a principle of universal causality, it is much harder to deny that it is reasonable to infer (non-deductively and defeasibly) a cause whenever confronted by a contingent or obviously causable condition.

This gain is only partially canceled by the greater vulnerability of such non-deductive arguments to successful rebuttals or defeaters. It is not at all clear that there are any considerations that would plausibly defeat the inference to a cause of the world. Probably the strongest objection of this kind (which I discussed in Koons 1997 and 2001) takes this form: it is ordinarily the case that wholly contingent things have wholly contingent causes (not necessary ones). However, the cause of the world, if it has one, would have to be necessary. Thus, either the world is exceptional by lacking a cause altogether, or by having a necessary being as its cause. There is no reason to prefer the one generalization to the other, and so the inference to a first cause is defeated.

The best response to this objection is to argue that the first cause would not be exceptional in any respect but would in fact fully conform to the general pattern. Each cause is in a sense more nearly necessary than its effects, since the particular cause exists in world in which its effects are missing, but not vice versa (see Koons

2000, 116-118).[1] The only thing that could be more nearly necessary than the cosmos (given that it includes all wholly contingent things) would be an absolutely necessary being. Thus, it is not all surprising or exceptional that the cosmos should have an absolutely necessary cause.

Richard Swinburne (Swinburne 1979) has deployed Bayesian reasoning on behalf of the cosmological argument, suggesting that the existence of a single first cause is the simplest explanatory hypothesis of the existence of a large and complex cosmos. I will also consider (in section IV) several versions of the cosmological argument that seek to infer the existence of God as the best possible explanation for certain specific kinds of phenomena.

II. The Justification Problem

The first problem to address is that of justifying a global causal or explanatory principle. Why assume that anything has a cause or causal explanation? The simplest move is to appeal to self-evidence. It is simply constitutive of perfect rationality that one look for and expect to find a cause whenever possible. As I mentioned above, it is hard to deny the reasonableness of a defeasible principle of causation, at the very least. However, there are several strategies available for defending the truth of exceptionless causal principles.

A. Empirical Inference to the Best Explanation

Alexander Pruss has argued that a global causal principle or Principle of Sufficient Reason is the best explanation for the fact that we don't see bricks and proton clouds appearing ex nihilo. (Pruss 2009, p. 9) A global causal principle provides the simplest explanation for this fact.

B. Epistemological Arguments

The first such strategy appeals to epistemological considerations.

If uncaused facts are possible, we cannot assign any objective probability to their obtaining or not obtaining. It is only when something is caused that we can appeal to the dispositions and propensities of its potential causes to ground a fact about objective probabilities. If uncaused events were possible, there occurrence would have no well-defined probability. Thus, we could never good grounds for supposing that any event was likely to have been caused at all, much less caused in any specific way.

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[1] There are at least two reasons for thinking this is so. First, the fixity of the past and the openness of the future indicate that particular effects necessitate (de re) their causes, but not vice versa. Second, the fact that things' origins are typically essential to them also supports the general necessitation of causes by effects.

This generates a defeater of all empirical claims, since all empirical claims to knowledge depend on the supposition that our experiences and memories have causes of the appropriate kind (veridical and non-deviant). In a world in which uncaused states are possible, a kind of counter-causal Cartesian demon would lurk behind every event, and we would never be in a position to judge with any reliability that such a demon were unlikely in any given case.

Could the laws of nature (contingently) rule out the possibility of uncaused and spatiotemporally bounded events in our world? No, since the laws of nature only specify what can happen *in the absence of* external influences. If uncaused events and entities were metaphysically possible, the laws of nature could not rule them out in our world either, since they could not, by themselves, rule out the spontaneous generation of new physical objects with new forces. The application of the laws of nature to exclude certain kinds of events always presupposes a global principle of causality.

What sort of causal principle is justified by these considerations? The principle must be strong enough to encompass any possible piece of empirical evidence, without requiring any empirical knowledge to justify its application (to avoid a vicious circularity). In other words, the principle must take the form: any F has a cause, where the description 'F' is broad enough to include any possible empirical data, and such that the application of 'F' to its instances is always certain on purely a priori grounds. The requirement of a priori applicability means that 'F' must take the form of something like 'appears to be G' or 'can coherently be thought to be G'. The requirement of scope means that G should include everything that is causable. Putting these facts together, we reach the conclusion that there must be an a priori knowable principle of the form: whatever is conceivably causable has a cause.

The fact that such a principle excludes that which is inconceivably causable poses no threat of incipient skepticism, since if one is justified in believing that something exists which is inconceivably causable, that justification cannot depend on the supposition that the thing was in fact caused in some way.

C. A Modal Argument for the Causal Principle

Building on Sullivan 1994, Pruss has also argued for a global causal principle from certain principles of modality. The causal principle that Pruss argues for takes the following form: if E is an actual state of affairs and E could possibly have a cause, then E does have a cause.

It seems plausible to suppose that an effect would not have occurred without the cause. Many, following Hume and David Lewis, have argued that this fact could be the basis for an analysis of causation. However, even if we suppose such

counterfactual analyses of causation to be unsuccessful, it still seems that such counterfactual dependency is a necessary condition for causation.

Pruss argues that we can assume something even weaker: if C caused E, then it should be the case that if nothing had caused E, then E would not have occurred. This weaker assumption works even in cases in which E is over-determined to happen.

(1) (C causes E) $\rightarrow$ ($\neg\exists$D (D causes E) $\square\!\!\rightarrow$ E did not occur)

The so-called Brouwer axiom of modal logic states that if some proposition p is actually true, then it is necessarily possible. This corresponds to a symmetry condition on the accessibility relations between worlds: if any world w is possible relative to our actual world, then the actual world must also be possible relative to w. The Brouwer axiom is entailed by but is weaker than the standard modal logic for metaphysical necessity, S5.

If we apply the principle behind the Brouwer axiom to counterfactual conditionals, we should get the following rule: if p is actually the case, then if p were not the case, then some world w would have been actual, such that, in w: if p were the case, the actual world might have been actual. This rule could be captured by the following axiom:

(2) (q & p & $\lozenge\neg$p) $\rightarrow$ ($\neg$p $\square\!\!\rightarrow$ (p $\lozenge\!\!\rightarrow$ q))

As it turns out, Pruss's axiom (2) is not valid in the standard semantics for counterfactual conditionals as developed by David Lewis and Robert Stalnaker, but Pruss argues persuasively that this points to a flaw in that semantics, not to any grounds for doubting (2). In addition, Pruss's proof requires two more obvious axioms involving conditionals (axioms that are valid in all standard theories):

(3) (p $\Rightarrow$ q) $\Rightarrow$ (p $\square\!\!\rightarrow$ q)

(4) ((p $\square\!\!\rightarrow$ q) & (p $\square\!\!\rightarrow$ $\neg$q)) $\Rightarrow$ $\neg\lozenge$p

In these axioms, '$\Rightarrow$' represents logical entailment.

Suppose that q is the true proposition that some state of affairs E occurs, and suppose that E can have a cause does not in fact have one. Let p be the proposition that nothing causes E. Thus, both p and q are true in the actual world. Since E can have a cause, we have $\lozenge\neg$p.

By (2), we know that if $\neg$p were the case, then if p had been the case, then q might have been the case. Let w be a world in which $\neg$p is true, in which E has a cause.

Let's call this possible cause C. Applying (1) to world w, we get the result that it is true at w that had E had not causes, i.e., had p been true, E would not have occurred. But this means that were ¬p true, it would have been the case both that (p □→ ¬q) and (p ◊→ q), which is impossible. So, ¬p is impossible, contrary to our hypothesis. Consequently, any state of affairs that can possibly have a cause must have a cause in fact.

Pruss goes on to argue (Pruss 2009, pp. 44ff) that all wholly contingent, positive states of affairs can have a cause. If a state of affairs S is wholly contingent, then we can conceive of a world in which something exists which has the power to bring that state of affairs into existence, and which exercises that power in that world, resulting in the state of affairs S. Thus, any wholly contingent, positive state of affairs would seem to be causable. There is only one reason for doubting this conclusion: S might include some entity E for which essentiality of origins holds. That is, E might be the kind of thing such that if any duplicate of E were to come into existence in any other way, it would have to be numerically from E. Thus, if S has no cause in the actual world, E could not exist in a world in which its existence (and thus S itself) had any cause at all. Consequently, Pruss proposes a weaker principle, (5), which explicitly excludes this case:

(5) Every wholly contingent, positive state of affairs that does not de re involve contingent entities for which essentiality of origins holds can have a cause.

Principle (5) encompasses all states of affairs that are characterized in purely qualitative terms. It seems plausible that if a state of affairs S' is the purely qualitative counterpart of S, and S' has a cause, so must S. Consequently, we can endorse (6):

(6) If all wholly contingent, positive states of affairs that do not de re involve entities for which essentiality of origins holds have causes, then all wholly contingent, positive states of affairs have causes.

Pruss argues that (6) will be true in any 'nice' world: one lacking indiscernible but distinct entities. Our world appears to be 'nice'. Putting (5) and (6) together with Pruss's global causal principle, we reach the result that every wholly contingent, positive state of affairs has a cause.

D. The Problem of Grounding Modality

As Alexander Pruss has argued (Pruss 2011), narrowly logical, Lewisian, Platonic (Robert M. Adams, Alvin Plantinga), and non-causal Aristotelian essentialist accounts are all problematic. The best alternative is Aristotelian: possibilities and necessities are all grounded (made true by) facts about the *powers* of actual things.

Immanuel Kant developed a similar argument in his pre-critical phase (Kant 1763/1994).

Suppose, for reductio, that there were a fact p that obtains without causal explanation. Let q be the fact that p obtains without explanation. Consider a world w in which p is false. Given the Brower axiom B, if p were false, q would still be possible. However, nothing in world w could ground the possibility of q. Hence, the grounding of modality requires a global principle of causation.

Pruss also provides an argument that doesn't depend on axiom B:

(7) If the causal principle is true in all possible worlds with the possible exception of the actual world, then it is true in all possible worlds.

If (7) is true, then either the causal principle is true in the actual world or there is some non-actual world w in which the causal principle is false. We can generate a contradiction from the second disjunct. Let p be some fact that obtains in w without explanation. Let r be some contingent fact that obtains in w but not in the actual world (if p does not obtain in the actual world, just let r = p). Then (r&p) is a contingent fact that obtains in w without explanation and does not obtain in the actual world. But this means (on the causal-Aristotelian account) that there is some entity with some causal power in the actual world capable of bringing it about that (r&p) be true without causal explanation, an obvious absurdity. (Pruss 2009, p. 21)

E. Relying on a Weak Principle of Sufficient

Richard Gale and Alexander Pruss showed (Gale and Pruss 1999) that a valid cosmological argument can be build by means of a weak principle of sufficient reason:

Weak PSR: it is *possible* that every contingent state of affairs have a sufficient explanation.

From the Weak PSR we can get the result that it is possible that a powerful necessary being exists. We can then use S5 (including the principle that whatever is possibly necessary is necessary simpliciter) to get the result that such a being actually exists.

There are two general worries with the Gale-Pruss move:

1. Do we have any grounds for believing the weak versions of the CP that aren't equally good grounds for believing the strong versions?

2. Is S5 to strong? Argument won't work with S4, or anything weaker.

In a series of recent articles, Joshua Rasmussen has created several variations on the Gale-Pruss theme. In Rasmussen 2010, he assumes the following:

(8) If x is an intrinsic type of concrete particular, then it is possible that the fact that there is at least one member of x has a causal explanation.

Consider the type of being a contingently existing concrete particular. By (8), it must be possible for something to cause this type to have at least one member. Such a cause must be a necessarily existing concrete particular. By S5, we can infer that this necessarily existing being exists also in the actual world.

In his 2011 paper (Rasmussen 2011), Rasmussen assumes instead:

(9) Any intrinsic property π that (i) possibly begins to be instantiated, and (ii) is possibly instantiated by something that has a cause is such that it is possible that there is a cause of π's beginning to be instantiated.

It is plausible to suppose that the property of *being a contingent concrete particular* (call it property *c*) is an intrinsic property that possibly begins to be instantiated and is possibly instantiated by something that has a cause. Therefore, it is possible that this property *c* is caused to begin to be instantiated. This cause could not itself instantiate *c*, on pain of a vicious circularity: something that instantiates a property π cannot be the cause of π's beginning to be instantiated. So, it is possible that there exist some powerful necessary being (and if powerful, then concrete). By S5, this necessary being exists in the actual world.

John Turri (Turri 2011) raised the following worry about Rasmussen's arguments: is the necessary being *powerful* in every possible world, including the actual one? In response to this worry, we consider the property of being either a contingent concrete particular or a necessary being with some contingent power. This seems to be an intrinsic property that could begin to be instantiated. Consequently, it must be possible for this property to be caused to begin to be instantiated. Thus, there must be some necessary being with some essential power in some possible world that causes this property to begin to be instantiated in that world. This enables us to infer (in S5) the actual existence of a necessary being with essential powers.

Another worry about Rasmussen's argument concerns his assumption that the property of being a contingent particular a property that is only contingently instantiated, or one that could begin to be instantiated. Suppose that the past is infinitely long, and that there always have existed contingently existing particulars. We might argue that, under those assumptions, it is metaphysically necessary that the property be instantiated, and metaphysically impossible that it should begin to be instantiated. This would follow if we accepted something like Sydney Shoemaker's Branch Principle (Shoemaker 1980):

Branch Principle: For every possible world w, there is a time t such that w agrees with the history of the actual world at every time before t.

According to the Branch Principle, if the past has always existed, then anything that has always been true is necessarily true, since any possible world must 'branch off' from the actual world some finite amount of time ago. The Branch Principle should be attractive to Aristotelians, since it accords with the idea that all mere possibilities are grounded in the powers of things in the actual world.

F. Objections to the Global Principle of Sufficient Reason/Causal Principle

1. Hume's imagination argument.

David Hume provides the source for an argument against the necessity of an exceptionless causal principle: we can imagine some event occurring uncaused, and whatever we can imagine is possible.

However, it is not at all obvious that we really can imagine some event occurring without any cause at all. Is the absence of the imagination of a cause necessarily the imagination of its absence?

2. The inconsistency of a sufficient reason for contingencies.

Peter van Inwagen (1983, pp. 202-4), James Ross (1969, pp. 295-304), and William Rowe (1975, 1984) have all argued that it is inconsistent to hold both (i) that there are contingent facts, and (ii) that there is a sufficient reason for every contingent fact. The sufficient reason for the sum total of all contingent facts must be a necessary fact. If that necessary fact is truly a sufficient reason for any other fact, the second fact must also be necessary, since whatever is necessitated by a necessary truth must be necessary itself. Hence, the Principle of Sufficient Reason entails that all truths are necessary, and so there is nothing for the supposed First Cause to cause.

This objection depends on two crucial assumptions: (1) no necessary proposition explains a contingent proposition, and (2) no contingent proposition explains itself.

Both are disputable. First, as Alexander Pruss has pointed out (Pruss 2009), there is a good ad hominem objection to (1): even if the PSR were false, it would still be a good explanation of the non-occurrence of some event to cite the non-occurrence of any possible cause of an event of that sort. However, given the falsity of the PSR, the non-occurrence of possible causes does not necessitate the non-occurrence of the event.

Second, statistical explanations seem fine, even though in those cases the explanans does not necessitate the explanandum. If it is very likely for a radium atom to decay

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in a given period of time, then that fact is a perfectly good explanation (a "sufficient reason", in the relevant sense) of the atom's actual decay.

In addition, anyone who accepts libertarian freedom and who rejects the randomness objection (the so-called *Mind* argument) must take the agent to be a non-necessitating cause of any of his free actions and so must either deny (1) or (2). For example, one could take a free action of a contingently existing being to be a self-explanatory fact, given explanations for the existence, freedom, knowledge and power of the agent.

The defender of the cosmological argument who rejects (1) must deny that every adequate or sufficient explanation is a contrastive explanation -- in the strong sense of being logically incompatible with the explanation of any contrary fact. In denying (1), one need not suppose that each of the contrary choices would have been explained by the very same facts as the actual choice was. However, each actual choice has to be explained by a set of actual facts (concerning the beliefs and values of the agent) despite the co-obtaining of certain other facts about the agent's beliefs and values that would have equally well explained the contrary choices.

3. Restricting the scope of the causal principle

It is possible to block the cosmological argument by replacing a broad causal principle with a much narrower one. For example, Graham Oppy has proposed the principle that all "non-first events" have causes (Oppy 2001). A "non-first" event is one that began at a certain time and was preceded in time by other events. Applying Oppy's principle leads to the conclusion that the first causes consist entirely of first events: events that either stretch back infinitely far into the past or that occur at the first moment of time. In either case, such first events are not likely to lead to interesting theological conclusions.

However, Oppy's proposal still leaves us vulnerable to the epistemological argument considered above. How do I know a priori that my current set of beliefs or experiences is not a first event? How do I know that the universe didn't just begin a moment ago? If I have to take this seriously as a real possibility, one whose probability I cannot judge to be low, then I have an effective defeater for any claim to empirical knowledge.

Here's an alternative proposal that might be more successful: all events with a finite temporal bound in the past have causes. Once again, however, this generates skeptical possibilities: perhaps my present mental state has existed changelessly for an infinite amount of time.

A third possibility: all events that do not include an infinite regress of causes have a cause. This still fails the epistemological test. For all I could know a priori, my

present state of consciousness could include such an infinite regress: an infinite series of mental states, each caused by and indistinguishable from its predecessors.

Laying aside these epistemological considerations, the skeptic might suppose that we have good reason to take beginningless events with infinite duration to be plausible exceptions to any causal principle, on the grounds that it is obvious that such events couldn't be caused. There are at least three reasons for doubting this:

(a) Past unbounded and past bounded intervals are mathematically isomorphic. Given relativity, whether an interval has an infinite duration or not can be frame-relative. It's unlikely that such frame-relative features could have metaphysical implications.

(b) It's not obvious that a past-unbounded interval couldn't be preceded in time by a further set of events, each *infinitely* far in the past – just as the finite natural numbers are succeeded by infinitely large numbers in non-standard models of arithmetic.

(c) It's not obvious that causes must precede their effects in time. Both simultaneous causation and causation by atemporal entities seems possible.

4. Causing the causing

James Ross objected to the cosmological argument on the grounds that the causal principle leads to an infinite regress. The proposition that God caused the actual universe (U) is a contingently true state of affairs, call it C(U). So, C(U) needs to be caused by God, and this causing is a further state of affairs, C(C(U)). This needs to be caused, ad infinitum.

One might argue, as I did in 1997, that C(U) isn't some further state of affairs, but is just the sum of God and the existence of the universe. Or, one might deny that it is a *wholly* contingent state of affairs, since it seems to include God's existence. Its wholly contingent part C* might not be distinct from E. Following Thomas Aquinas, we might suppose that C(U) is simply identical to U itself, since "the actuality of the cause qua cause is the effect."

In addition, as Pruss has argued (Pruss 2009, p. 50), the regress might be real but not vicious. C's causing E is not a cause of E itself. C's causing E is not more fundamental causally or explanatorily than C itself. These further causal facts are 'epiphenomenal', not part of the causal explanation of the event.

Finally, we could identify God's causing the universe with God's causal activity, which is identical to God himself, a necessary being. To think that this makes the universe itself necessary is to commit the de re/de dicto fallacy. (Pruss 2009, 51)

III. The Regress Problem

If we suppose that there is some version of a global Causal Principle or Principle of Sufficient Reason that can be known to true, then the next problem to face is that of the Regress Problem: why doesn't the principle entail an infinite regress of causes, with no stopping point? There are two basic approaches to solving the problem: arguing that infinite regresses are impossible, and arguing that they would be irrelevant, even if they were possible. The second strategy involves some kind of aggregation or conjunction of all of the wholly contingent or causable facts into one gigantic whole. If it can be shown that this whole, whether or not it contains one or more infinite regress within it, is itself wholly contingent (or causable), then the relevant Principle can be applied to the whole, resulting in a First Cause that is necessary and uncausable.

I'll look at two versions of the first strategy (the Kalaam and the Thomistic argument) in sections A and B, followed by four versions of the second strategy (aggregation, plural logic, set theoretic, and Leibnizian conjunction).

A. The Kalaam Argument

The Kalaam argument attempts to rule out a diachronic infinite regress by demonstrating that the past is finite. The argument receives its name from the "Kalaam" tradition of medieval Islamic philosophy (including al-Kindi and al-Ghazzali), but it has roots in Plato's *Timaeus* and in John Philoponus's critique of Aristotle in the 5th century A.D. I will present briefly a version of the argument in Koons 2012, building on some work of Jose Benardete and Alexander Pruss.

Let's suppose for reductio that it is possible that there be an infinite regress of temporal periods, with a latest member but no earliest. If that regress is possible, then it should also be possible to populate each period with a telegraphist, numbered from 1 (the last in the sequence) to infinity. We assign each telegraphist a unique time for action: telegraphist 1 at noon on January 1st, 1 BC, telegraphist 2 on the same date and time in 2 BC, and so on. Each telegraphist acts according to the following, simple script: if he receives a signal on January 1st of the year preceding his assigned year, then he simply transmits that same signal to his successor on January 1st of his own year. If he receives no signal on the day assigned to his predecessor, then he transmits to his successor his own number ('1' if he is telegraphist #1, '2' if he is #2 and so on).

We can prove, given these assumptions, both that some telegraphist must transmit his own number, and that no telegraphist can do so. We can prove that some telegraphist must transmit his number since, if none has done so, then none before #1 has done so, and in that case telegraphist #1 would have transmitted his own number. However, if some telegraphist, say #n, has transmitted his number, then this entails that no telegraphist with a larger number has done so. However, this is

impossible, since if no telegraphist with number greater than n+1 had done so, then telegraphist n+1 would have, and so n would not have.

Since we get a contradiction from the assumptions, at least one must be false. The only assumptions required are the following (Koons 2012):

1. The possible existence of an infinite regress of temporal periods.

2. The existence of a single telegraphist with the required abilities and dispositions is possible, and this type of situation can be characterized in terms that are intrinsic to a spatiotemporally bounded situation.

3. David Lewis's Patchwork principle: if a certain spatiotemporal structure is possible, and a certain event-structure (characterized in terms intrinsic to a spatiotemporally bounded situation) is possible, then it is also possible to populate the spatiotemporal structure with exact copies of the event-structure.

The Patchwork Principle is so-named because it enables us to construct a new possible world (the 'quilt') from a finite collection of isolated possibilities (the 'patches'), given an adequate spatiotemporal structure (the 'frame'). The PP plays an important, arguable indispensable, role in our knowledge of unactualized possibilities.

Assumptions 1-3 cannot all be true, since they jointly entail the impossible infinite telegraphic regress story. Since 2 and 3 are quite plausible, the weak link would seem to be 1. Rejecting 1 entails that the past is finite, and consequently any diachronic chain of causation would have to have a first element, an uncaused first cause.

Critics of this argument must focus on the Patchwork Principle. As the first objection, one could deny that the PP applies in this case, on the grounds that the description of each telegraphist is not truly intrinsic to the bounded and discrete spatio-temporal region assigned to that telegraphist in the story. For example, we could not apply the PP to a scenario in which each telegraphist is the tallest telegraphist in history, resulting in the absurd conclusion that infinitely many telegraphists could all be the tallest telegraphist in history, since being *the tallest telegraphist in history* is not intrinsic to each telegraphist's life-span.

This objection to the argument would make sense from a Humean perspective, according to which the powers and dispositions of a thing are not intrinsic to that thing but instead depend upon the whole history of the world (including the patterns of 'constant succession'). Aristotelians, however, cannot take this objection seriously, since the fundamental powers and dispositions of a thing during a period of time are, for the Aristotelian, paradigmatically intrinsic to it at that time.

A second objection would consist in pointing out the tension between the PP and a global causal principle. The PP would allow us to put together a series of scenarios, none of which is preceded by any possible cause of it. However, this objection could also be settled by weakening the Patchwork Principle in order to make it consistent with a global causal principle. The revised PP would add the proviso that each situation (as described) have an adequate cause in the hypothesized story. This revised PP would still be adequate for the reduction of assumption 1, since it would be easy enough to add to the infinite regress story an adequate causal explanation for the existence and powers of each of the telegraphist.

The third objection involves an appeal to Shoemaker's Branch Principle (mentioned above). If we accept the Branch Principle, then any application of the Patchwork Principle must be bounded in the past: there must be some time in the past such that, at all earlier times, the possible world agrees with the actual world. Under these constraints, we have grounds for rejecting the possibility of the infinite regress while acknowledging not only the possibility but the actuality of an infinite past. Moreover, the Branch Principle is attractive, from an Aristotelian perspective, since it grounds all possibility in the actual powers (at some time in the past) of actual substances.

There are several responses to this Branch-Principle objection available to the defenders of the Kalaam argument.

1. First, if we combine the Branch Principle with an infinite past, then we must deny the contingency of any of the features of the world that are necessarily conserved from one moment to the next, such as the exact quantity of mass-energy or charge, or the exact number of baryons.

2. Leads to an A-theory of time, which supports a new argument (see next section).

3. Requires an explanation of the perpetuation of time through an infinite past: Aquinas's Third Way (Maimonides).

B. Aquinas's Appeal to Per Se Causation

Why couldn't there be an infinite regress of causes? Again, we must remember that Aquinas is denying the existence of an infinite chain of *essential* causes, not of merely *accidental* ones. Aquinas would argue that a chain of causes going backward in time could be infinite, since it would be a chain of merely accidental causes. The real cause of the existence of each thing in the chain would be the timeless God: the previous members of the chain would be merely instruments used by God. Aquinas clarifies what he means here by means of his hammer illustration. Consider a shoemaker who has made a pair of shoes. The shoemaker and his craft is the essential efficient cause of the existence of the pair of shoes. Let's suppose that the use of a hammer is an indispensable part of the shoemaker's craft. Then the

involvement of at least one hammer would be part of the essential cause. However, the number of hammers would not be. Suppose that the shoemaker used several hammers in making this pair, because the first hammer wore out, the second was lost, the third borrowed by a neighbor, and so on. The number of hammers involved makes no difference to the origin of the shoes. Similarly, the number of ancestors that a person has is only an accidental feature of his cause, since human parents are only instruments God uses in causing the existence of particular men. God could have created an infinitely old universe, using infinitely many ancestors as instruments in the creation of each human being without violating the principle in premise 7, since the chain of essential causation would in each case terminate in God.

Suppose the skeptic believes that my present existence is *essentially* caused by my own past existence, and, more remotely, by the past existence of my ancestors. In this case, Aquinas would deny that the causal chain could be infinite, even if it does go back in time. Thus, the important distinction is between essential causation and accidental causation, not between simultaneous causation and causation through time. Aquinas assumes that causation through time is always accidental causation, since he can't accept that a past event could be the essential cause of a present event (like my present existence). However, if a skeptic denies this and argues that we do receive our present existence from the past (by a kind of "inertia of existence" principle: whatever exists tends to go on existing), then Aquinas will deny that this chain of existence-receptions can go back to infinity, again because such a chain would fail to explain why anything in the chain (and the chain as a whole) has come to exist.

The Second Way argues that there must be a first cause whose essence is existence, on the grounds that every finite thing (thing whose essence is not identical to existence itself) has a *per se* cause, and no *per se* causal regress can be infinite. A *per se* causal series cannot be infinite, since this would entail that the essence of each member of the series is infinitely deep and so unintelligible.

Why are per se causes needed at all? Otherwise, the existence of a thing would be unintelligible. So, a tacit appeal to a version of the PSR.

The second way: focus on the cause of the existence of substances. To exist, a substance must be active. A substance that isn't pure act, pure being, is not self-sufficient. It requires external factors to enable it to perpetuate itself. These factors must be incorporated into its definitions. Definitions must be finite – so must be a first cause. (Moscow paper) Not just the perpetuation of time, but the perpetuation of enduring existence of substances in time.

Also, my paper on Miller's cosmological argument.

C. The Aggregation Move. (Al-Farabi)

My 1997 APQ paper.

The problem of infinite regress solved: al-Farabi's aggregation principle.

The argument can be taken either synchronically (simultaneous causation) or timelessly (there is a timeless cause of the existence of the entire Block Universe of B-Theory).

A variant (suggested by Pruss, 2009, p. 62): limit the principle to wholly contingent, wholly positive states of affairs.

Taxicab: distinction between necessary and wholly contingent.

Theory about causal priority: asymmetric token necessitation. Extrapolation.

Three reasons for ASN. Realism Regained, pp. 116-7. (i) Origins essentialism, (ii) Probabilistic screening off (Salmon 1984, Suppes 1984, Pearl and Verma 1992, Spirtes et al. 1993), (iii) fixity of past vs. openness of future.

Wesley Salmon, 1984.

Patrick Suppes, 1984.

Judea Pearl and T. S. Verma, 1991.

P. Spirtes, C. Glymour, and R. Scheines, 1993.

Generalizing to necessary states of affairs.

x is more fundamentally necessary than y iff the necessity of y depends on the necessity of x.

Aquinas's argument (in Third Way) for thinking that there cannot be an infinite regress of such dependencies. Gives us something that is independently necessary, necessary of itself.

Suppose for contradiction that there were such an infinite regress of accidentally necessary beings. To be accidentally necessary, it must be the case that, *per impossibile*, if the being's cause had been absent, it would not have been necessary itself (it, too, could have failed to exist). If so, it seems obvious that the existence of the whole regress must then be contingent, since we can conceive of each being as not existing because we are simultaneously conceiving of its cause as also not existing. But if the whole series is contingent, then each member of the series must

be contingent. This contradicts our assumption that each was (accidentally) necessary. So, such an infinite regress of accidental necessity must be impossible.

If so, any accidentally necessary being must derive its necessity ultimately from some being that is necessary in itself.

D. Pluralizing the Argument

Avoiding mereological universalism

E. Meyer's Set-Theoretic Argument

Robert K. Meyer (1987).

CP for chains: if S is a causal chain of contingent items, then there is a cause of every item in the chain.

Assume that causation is transitive and irreflexive.

Meyer's Theorem: Assume CP for Chains, and that causation is transitive and irreflexive, and assume that Axiom of Choice. Suppose that there is a set U of all items. Then, for any contingent item e, there is a necessary being G such that G causes e.

F. Leibnizian Conjunction

Simple version

1. Every contingent fact has an explanation
2. There is a contingent fact that includes all other contingent facts.
3. Therefore, there is an explanation of this fact.
4. The explanation must involve a necessary being.
5. This necessary being is God.

Why restrict it to contingent truths? We don't understand well how necessary truths can be explained. By derivation from axioms? But what about alternate axiomatizations? What would make certain necessary truths objectively axiomatic?

Why not restrict it to truths that are possible explainable? One might argue that all inexplicable truths are necessary (the truths that are necessary per se), but not vice versa.

Can we form the Big Conjunctive Contingent Fact? Worries about set theory, raised by Davey and Clifton (2001).

Let p be the conjunction of all true propositions that do not contain themselves as proper sub-formulae. Let q be the proposition that p is true. Is q a sub-formula of p? Either way a contradiction ensues.

Pruss's Restricted PSR. Every proposition that can have an explanation does have an explanation.

A technical assumption:

(1) There is a set Q of kinds such that: (a) for no x does x's being of K, where K is in Q, depend on anything with essential origins, and (b) every contingent object x is a member of at least one kind from Q. (p. 64)

Let p be the proposition that at least one of the kinds in Q has at least one contingently existing member. This clearly can have an explanation: the existence of some thing of a natural kind not in Q that causes the existence of some member of Q.

Assume that the kinds are natural kinds: that no member of a kind is a member of that kind as a result of its own causal activity.

G. Is a First Cause compatible with the possibility of an infinite regress?

Tension between a first cause and the possibility of an infinite causal regress. How can the first cause cause the entire regress? This would seem to require massive causal Overdetermination, as I argue in RR. Options: (1) the first cause argument does give us reason (after all) to reject the possibility of infinite regresses, (2) the first cause somehow causes the existence of the entire, causally and temporally structured whole, by means of some kind of holistic higher-order causation, (3) the first cause causes each member of the series to cause its successor (by means of an atomistic higher-order causation). Option (3) seems problematic, since it doesn't make clear how the first cause can be a total cause of the whole regress, as opposed to a merely partial cause of each link. Two seems promising, if one can import some sort of Aristotelian distinction between per se and per accidens causation: the links in the regress are each per accidens causes of their successors, but only the First Cause is a per se cause of each member. One might use some notion of instrumentality here: the FC creates each member of the regress, using the infinitely large class of predecessors as an instrumental cause. It's still hard to see how this works – in what sense is the instrumental cause a cause at all? Perhaps in the sense of a sine qua non – a necessary context within which God's creative act occurs?

IV. First Cause Arguments without a Global Principle of Causal Explanation

A. The Perpetuation of Time (Aquinas's First Way)

The first way and the A theory. A cause of the perpetuation of time itself.

Hypothesis of inertia of movement or of existence does not solve the problem. Inertia presupposes the perpetuation of time – it cannot explain it. No action over a temporal gap.

An Aristotelian argument for A-Theory. Moving spotlight or falling branches picture.

A-Theory implies the pure passage of time. Hence, there are real events constituting the arrival of each new moment. If every event must have a cause, so must these events. (They are contingent since only one can be actual at once – each was merely potential in advance.) The cause of the arrival of the present cannot be 'in time': it cannot act according to some time-parameterized law of nature. In addition, the cause of the actualization of time t cannot occur at any time other than t (doing so would involve action at a causal distance – and besides, nothing existing at those times can be actual at t). Nor can it come into existence at t, without generating an infinite regress. It must be timeless, and its mode of causation must be non-physical, non-mechanical. Something like an intentional volition.

The cause must be not only unchanging but absolutely unchangeable. Pure act.

B. A Neo-Platonic argument from the Unity of the World

Assume a B-theory. What unifies the world's spatiotemporal structure?

The problem of the coordination of relations. Spacetime consists of more than two entities. If A and B are spatiotemporally related, and B and C are spatiotemporally related, then A and C must also be. What could the explanation of this coordination be? Triangle law: the distance between any two events must be less than the sum of the distances of the other two pairs.

Why does it need an explanation? Massive unexplained coincidence.

B-theory. The problem of the unity of the spatiotemporal domain. A Plotinian argument: requires a non-spatiotemporal, spatially and temporally simple entity. What could the mode of causation be? Something like intention.

Need the explanation be causal at all?

C. Maimonides's Argument (Aquinas's Third Way)

Suppose there is an infinite *per accidens* regress, and each thing in the series has no *per se* cause. Now, just as there can be no *per se* infinite causal *re*gress, there also cannot be a *per se* infinite causal *pro*gress. That is, it cannot be the case that each thing is such that it essentially has a certain effect, and that effect essentially has a further effect, and so on ad infinitum. Such an infinite progress would also require

each thing to have an essence that's infinitely deep and so unintelligible. Thus, in the world we're imagining, no effect has any cause essentially, and no cause has any effect essentially. All of the causal connections are accidental in both directions. (Let's call this a doubly accidental series.)

This is where the Third Way comes in again. There are two cases to consider:

(A) at some point in the causal regress, we reach a cause that exists necessarily, or
(B) every cause in the regress is contingent.

a. Why must there be a necessary being? (Why not case B?)

The first part of the Third Way is designed to rule out case (B). Everything that exists, we're now assuming, is both contingent and dependent on a thoroughly accidental infinite causal series. There is, by hypothesis, no explanation of why all of the causes in that series were successful in the actual world in producing their effects. It is, therefore, an infinitely large coincidence that each series has reached its current position.

Maimonides and Aquinas make this point by means of a very vivid picture: they suggest that at some point in the infinite past it is very likely that all causal lines would have 'petered out' simultaneously, resulting in an empty world from which there could be no recovery. As many critics have pointed out, this seems to commit the fallacy of composition: if it's possible for each thing to cease to exist, then it's also possible for all of them to cease to exist simultaneously. However, argument doesn't depend on this extreme hypothesis. All that Aquinas needed to point out was the infinitely large coincidence involved in the eternal, accidental perpetuation of *each* doubly accidental causal series, taken individually.

When we reconstruct the Maimonides/Aquinas argument in terms of modern probability theory, the argument does require two additional assumptions: (i) that there have been (throughout history) only finitely many causal chains, and (ii) that there be a finite, nonzero probability for each chain to expire at each link, with the probability of expiration of any link being independent of the probabilities of expiration for any of the later links. If there had been an infinite number of chains, then there might be a finite, non-zero probability that a finite number of causal chains survive an infinite series of opportunities to expire. This would also be the case of all but finitely many of the links in the chain had either a zero or infinitesimal chance of not occurring. Formally, here is the argument:

1. Necessarily, any infinite causal chain is contingent in both directions (from cause to effect and effect to cause).
2. Necessarily, if an infinite causal chain is contingent in the cause-to-effect direction, then there is, for each link in the chain a finite, nonzero probability of the cause's failing to produce the effect, and these probabilities are mutually independent.

3. The set of all infinite causal chains that have ever existed in the history of the world is finite in number.
Therefore, the probability of the existence at any time of any infinite causal chain that is contingent in either direction is either zero or infinitely close to zero.

It might be thought that Aristotelians like Maimonides and Aquinas would have an argument for premise 3, given their rejection of the possibility of actual infinities. However, the falsity of premise 3 would not require that infinitely many chains should exist at any one time. Imagine, for example, a world in which the number of chains increases exponentially as time recedes into the past. In such a world, the number of chains that exist at some time or other is infinite, even though there are never more than a finite number in existence. Moreover, even if we assume that the universe has a finite bound on its size, this would not entail a finite bound on the number of simultaneous causal chains unless there was also a finite bound on the smallest possible size for a causal agent. We could, for example, imagine a world of fixed and finite size, in which the causal agents get smaller and smaller the farther back in time one goes. So, premise 3 will have to stand as an independent assumption of the proof, and a potential weak point.

V. From First Cause to God

Second stage: discuss Gellman, O'Connor, Kretzmann (Metaphysics of Theism)

Aquinas's argument from divine simplicity. To prove that God has all 'perfections', Aquinas must assume that any perfection in an effect must be present in the cause, either according to the same nature, or in a 'more eminent mode'. (I.4.2)

How to prove this?

If we accept it, and if we suppose that the First Cause is the first cause of all contingent beings in all possible worlds, it follows that God has all possible perfections essentially.

Argument for oneness and omnipotence.

N is a creator in w iff N is a necessary being that explains all the contingent truths of w.

Iterative principle: if x has the power to gain the power to do A, then x already has the power to do A.

From IP, it follows that if N is a creator in any world, then all of N's powers are essential to it.

Gellman proves that if N1 is a creator in world w1, and N2 in world w2, then N1 = N2.

Pruss's argument (p. 71-2):

"What explains in w1, we may ask, why it is that N2 exercised none of its powers to prevent N1 from engaging in the kind of activity it engages in in w1? It must be that the explanation lies in the exercise of some power P by N1 in w1. But then N1 also had this power in w2 and did not exercise it, and its failure to exercise it must be explained by N2's exercise of some preventative power Q. But Q is one of the powers that enables N2 to prevent something N1 does in w1, and so P includes the power to prevent N2 from exercising Q. Repeating the argument with the two entities and worlds swapped, we conclude that each of N1 and N2 has the power to prevent the other from its preventing the other. But that is, surely, absurd!"

Thomistic argument from simplicity.

1. If x is an actually existing concretum, then there is an actually true proposition p of such a form that p is the proposition that x actually exists (an actual existence proposition for x).

2. If x is an actually existing concretum other than an act of pure existence, then x's actual existence proposition is not made true simply by x but by something containing a concretum that is ontologically prior to x.

3. Ontological priority is transitive and well-founded.

4. Hence, the truthmaker for every actual existence proposition contains an act of pure existence.

5. Necessarily, any two acts of pure existence are identical.

6. Necessarily, there actually exists at least one concretum.

7. Therefore, there is a unique act of pure existence that exists necessarily. Call this act "God".

8. Definition: x is a per se cause of y iff the truthmaker for y's actual existence proposition contains x, x is ontologically prior to y, and x is a concretum.

9. An act of pure existence is a concretum.

10. Therefore, God is necessarily the cause of every other concretum.

Most critical assumptions are 2 and 3. If x is not an act of pure existence, then the actual existence proposition for x is composite, containing both the concept of the nature of x and a concept signifying actual existence. Such a proposition requires a composite truthmaker, one containing some tie between the nature of x and an act of existence. This tie can be either direct or indirect. In either case, some pure act of existence will be the ultimate cause of x's existence: an ontologically necessary and prior condition of x's actual existence.

Absolute existence has certain properties by default, in the absence of a sufficient reason to the contrary. These must be the positive properties, those underlying active powers, if the absolutely existing thing is to be potentially active.

Define simply positive and simply negative properties.

If U is universal, then the instantiation of U is a simply positive property, and the non-instantiation of U is simply negative.

The conjunction or disjunction (including infinite conjunctions and disjunctions) of simply positive properties is simply positive, and similarly for simply negative properties.

The partial existential generalization of a simply positive relation is simply positive, as is the universal generalization of a simply positive relation. Similarly for negative relations. Relational properties of individuals that are founded on simply positive relations are simply positive, and similarly for negative relational properties.

The possibilification and necessitation of a simply positive property is simply positive, and similarly for negative properties.

The negation of a simply positive property is simply negative, and the negation of a simply negative property is simply positive.

A property is purely positive if and only if exemplifying it does not entail (either strictly or by default) exemplifying any simply negative property.

A property that is not purely positive is implicitly negative.

Claim: existence is purely positive.

Definition: x exists to a greater degree than y iff x's essence includes strictly more purely positive properties than does y's.

Claim: if x's essence is to exist, then x exists to a maximum degree (to a greater degree than any possible thing distinct from x).

The essence of such a thing must either exist to a maximum or to a minimum degree. It can't exist to a minimum degree, since in that case it would be powerless.

Consequently, the essence of such a thing must include every purely positive property.

Bibliography

Aquinas, St. Thomas (1964), *Summa Theologica* (New York: McGraw-Hill).

Clarke, Samuel (1803), *A Discourse Concerning the Being and Attributes of God, the Obligations of Natural Religion, and the Truth and Certainty of the Christian Revelation* (Glasgow: Griffin and Co.).

Craig, William Lane (1980), *The Cosmological Argument from Plato to Leibniz* (London: Macmillan).

Davey, Kevin and Robert Clifton, "Insufficient Reason in the 'New Cosmological Argument," *Religious Studies* 37:485-490.

Gale, Richard M. and Alexander R. Pruss (1999), "A New Cosmological Argument," *Religious Studies* 35(4): 461–76.

Gale, Richard M. and Alexander R. Pruss (2002), "A Response to Oppy and to Davey and Clifton," *Religious Studies* 38:89-99.

Gellman, Jerome (2000): "Prospects for a Sound Stage 3 of Cosmological Arguments," *Religious Studies* 36:195-201.

Kant, Immanuel (1763/1994), *The One Possible Basis for the Demonstration of the Existence of God*, trans. Gordon Treash (Lincoln, Neb.: University of Nebraska Press).

Koons, Robert C. (1997), "A New Look at the Cosmological Argument," *American Philosophical Quarterly* 34: 171-192.

Koons, Robert C. (2000), *Realism Regained: An Exact Theory of Causation, Teleology, and the Mind* (New York: Oxford University Press).

Koons, Robert C. (2001), "Defeasible Reasoning, Special Pleading, and the Cosmological Argument: A Reply to Oddy," *Faith and Philosophy* 18:192-203.

Koons, Robert C. (2005), "Defeasible Reasoning," *Stanford Encyclopedia of Philosophy*, www.plato.stanford.edu.

Koons, Robert C. (2008), "Epistemological Foundations for the Cosmological Argument," *Oxford Studies in the Philosophy of Religion, Volume 1*, ed., Jonathan Kvanvig (New York: Oxford University Press).

Koons, Robert C. (2012), "A New Kalam Argument: Revenge of the Grim Reaper," *Noûs* (2012, forthcoming).

Kretzmann, Norman (1997), *The Metaphysics of Theism: Aquinas's Natural Theology in Summa Contra Gentiles 1* (Oxford: Clarendon Press).

Maimonides (1956), *The Guide for the Perplexed*, 2nd ed., translated by M. Friedländer (New York: Dover).

Meyer, Robert K. (1987): "God Exists!" *Noûs* 21:345-361.

Miller, Barry (1992), *From Existence to God: A Contemporary Philosophical Argument* (London: Routledge).

O'Connor, Timothy (2008), *Theism and Ultimate Explanation: The Necessary Shape of Contingency* (Malden, Mass.: Blackwell).

Oppy, Graham (1999), "Koons' Cosmological Argument," *Faith and Philosophy* 16:379-389.

Pearl, Judea and T. S. Verma (1991), "A theory of inferred causation," in J. A. Allen, R. Fikes and E. Sandewall, eds., *Principles of Knowledge Representation and Reasoning: Proceedings of the Second International Conference* (San Mateo, Calif.: Morgan Kaufmann).

Pruss, Alexander R. (2006), *The Principle of Sufficient Reason: A Reassessment* (Cambridge: Cambridge University Press).

Pruss, Alexander R. (2009), *Blackwell Companion to Natural Theology*, William Lane Craig and J. P. Moreland, eds. (Oxford: Blackwell).

Pruss, Alexander R. (2011), *Actuality, Possibility, and Worlds* (New York: Continuum Books).

Rasmussen, Joshua (2009), "From a Necessary Being to God," *International Journal of Philosophy of Religion* 66(1): 1–13.

Rasmussen, Joshua (2010), "From States of Affairs to a Necessary Being," *Philosophical Studies* 148(2): 183–7.

Rasmussen, Joshua (2011), "A New Argument for a Necessary Being," *Australasian Journal of Philosophy* 89(2):351-356.

Ross, James F. (1969), *Philosophical Theology* (Indianapolis: Bobbs-Merrill).

Rowe, William L. (1975), *The Cosmological Argument* (Princeton, N. J.: Princeton University Press).

Rowe, William L. (1984), "Rationalistic Theology and Some Principles of Explanation," *Faith and Philosophy* 1:357-369.

Rutten, Emanuel (2012), *A Critical Assessment of Contemporary Cosmological Arguments: Towards a Renewed Case for Theism*, Ph.D. dissertation, Free (Vrije) University, Amsterdam, The Netherlands.

Salmon, Wesley (1984), *Scientific Explanation and the Causal Structure of the World*, (Princeton, N. J.: Princeton University Press).

Shoemaker, Sydney (1980), "Causality and Properties," in Time and Cause, ed. Peter van Inwagen (Dordrecht: D. Reidel), pp. 109-35.

Spirtes, P., C. Glymour, and R. Scheines (1993), *Causation, Prediction and Search*, (Berlin: Springer-Verlag).

Sullivan, Thomas (1994), "On the Alleged Causeless Beginning of the Universe: A Reply to Quentin Smith," *Dialogue* 33:325-335.

Suppes, Patrick (1984), *Probabilistic Metaphysics* (New York: Blackwell).

Swinburne, Richard (1979), *The Existence of God* (Oxford: Clarendon Press).

Taylor, Richard C. (1974), *Metaphysics*, 2nd ed. (Englewood Cliffs, N. J.: Prentice Hall).

Turri, John (2011), "A New and Improved Argument for a Necessary Being," *Australasian Journal of Philosophy* 89(2): 357-9.

Van Inwagen, Peter (1993), *Metaphysics* (Oxford: Oxford University Press).

Weaver, Christopher (2012a), "What could be caused must actually be caused," *Synthese* 184(3):299-317.

Weaver, Christopher (2012b), "A Church-Fitch Proof of the Universality of Causation," *Synthese* (forthcoming).