Sobel on Gödel's Ontological Proof

Robert C. Koons

Department of Philosophy

University of Texas at Austin

koons@mail.utexas.edu

July 6, 2005

1 Gödel's Ontological Proof

Kurt Gödel left with his student Dana Scott two pages of notes in which he sketched a new version of Anselm's ontological proof of God's existence. In his most recent book,[14] Howard Sobel spends the greater part of a chapter to an elucidation and critique of Gödel's argument, as well as to an emended version of that argument proposed by Anthony Anderson.[1]

The ontological argument has garnered quite a bit of attention in the last fifty years. In most cases, philosophers have agreed that the argument is unsuccessful but have disagreed vigorously over where exactly the fatal flaw lies. This paper, will to some extent, follow the familiar pattern. I will argue that

Gödel's argument is unsuccessful, but I hope to show that Sobel and Anderson have both misdiagnosed its failure, and, consequently, Anderson's attempted repairs are likewise unsuccessful. However, I will close with a sketch of my own proposed repair of Gödel's argument, and I will suggest that, although the repaired argument is not by itself a successful theistic proof, it may represent a fruitful matter for future investigation.

Technically speaking, Gödel's argument requires second-order quantified modal logic, with a single third-order predicate of properties, P, intended to signify that a property is "positive". Gödel uses a standard modal logic, including axioms 5 and T (or at least B). Gödel's notion of a "positive" property seems to have two distinct bases: an axiological understanding of positivity, and a purely logical understanding. The axiological understanding is something like this: a property F is positive iff having F is compatible with being perfect (in a moral and aesthetic sense). The logical notion is something like this: w hen the logical form of the property is correctly analyzed (using a logically perfect language in Russell's sense, a language whose lexical primitives correspond perfectly to ontological primitives) the prenex, disjunctive normal form of the correct formulation of the property has at least one negation-free disjunct.

These two conceptions are, of course, not entirely unrelated. The Neoplatonic and Augustinian tradition in Western philosophy and theology has long maintained a "privation theory of evil": that every defect in a thing, whether moral, aesthetic or whatever, consists in the thing's lacking some positive qual-

ity. As it is often put, being and goodness are convertible. To be good is simply to be: to fail to be good is (in some relevant respect) to fail to be. On this conception of evil (that is, of imperfection), the two conceptions of positivity coincide perfectly: a property is incompatible with perfection just in case it entails that its bearer is lacking in some positive quality, and this entailment occurs just in case the correct formulation of the property contains negations in every disjunct.

In my view, this privative theory of evil is a reasonably plausible one, so I will not fault Gödel's argument for presupposing it.

Gdel's proof depends on five axioms and three definitions:

A1. $P(\neg F) \leftrightarrow \neg P(F)$

A2. $(P(F)\&\Box(F \rightarrow G)) \rightarrow P(G)$

Axiom A1 tells us that a property is positive iff its negation is negative. This makes sense on both the logical and the axiological understandings. If the correct formulation of F contains a negation-free disjunct, then every disjunct in the formulation of $\neg F$ contains a negation, and vice versa. On the axiological understanding, it is clear that if $\neg F$ is incompatible with perfection, then F must be compatible with it (this is the right to left direction of A1). As Anderson pointed out, the left-to-right direction of A1 isn't so obviously true on the axiological interpretation: couldn't both F and $\neg F$ be compatible with perfection? However, if goodness and being are truly convertible, then, since at

least one of F or $\neg F$ must entail a degree of negativity or privation, they can't both be compatible with absolute perfection.

Axiom A2 indicates that, if F is positive, then any property that F necessitates must also be positive. This clearly makes sense under both interpretations of positivity. Axioms A1 and A2 has an important corollary:

Th. 1. $P(F) \rightarrow \Diamond \exists x Fx$

If a property F is positive, it must be possibly instantiated, since a property that is not possibly instantiated necessitates every property (vacuously), and then, if this impossible property were positive, by Axiom A2, it would follow that every property is positive, which is clearly ruled out by A1.

Gödel defines Godlikeness as the possession of all positive properties:

Def. G: $G(x) \leftrightarrow \forall F(P(F) \rightarrow F(x))$

A3. $P(G)$

Axiom A3 asserts that G is positive. This makes good sense under both interpretations of positivity: if no positive property entails any negativity or privation, then G (which is, in effect, the infinitary conjunction or intersection of all the positive properties) must also be potentially negation-free. Similarly, to possess all the properties compatible with perfection is surely itself compatible with perfection. From A3 and Th. 1, it follows that G is possibly instantiated.

A4. $P(F) \rightarrow \Box P(F)$

Axiom A4 simply states that being positive is an essential attribute of every positive property, an unexceptionable claim.

Def. Ess. $F\text{Ess } x \leftrightarrow F(x)\&\forall G[G(x) \rightarrow \Box(F \rightarrow G)]$

A property is an "essence" of a thing in Gödel's idiosyncratic sense just in case the thing has the property, and the property necessitates all of the thing's other actual properties. An essence is something like a total individual concept: the property of a thing that encompasses all of its actual properties. If we assume that two properties are identical if each entails the other, then it is easy to show that each thing has at most (and presumably exactly) one essence.

It is easy to prove that Godlikeness is an essence (in this sense) of anything that has it:

Th. 2. $G(x) \rightarrow G \text{ Ess } x$

Next, Gödel introduces a definition of *necessary existence*. Again, Gödel uses this phrase in a non-standard sense. What he calls "necessary existence" is really something like a contingency-free existence: having only those *essential* or total properties that are necessarily instantiated by something or other.

Def. NE. $NE(x) \leftrightarrow \forall F[F \text{ Ess } x \rightarrow \Box\exists x F(x)]$

Gdel's NE is much stronger than necessary existence, as it is ordinarily understood. An object x might exist even though its essence (its total or individual concept) might not have been instantiated: this will happen whenever the necessarily existing thing has even one contingent property. (If being identical to

x is a property of x, then Gödel's NE property does entail necessary existence. If, however, we don't count such things a properties strictly speaking, then it would be possible for a contingent being to have Gödel's NE property, so long as, in every possible world, something exactly like it exists.)

Finally, Gödel assumes that *necessary existence* in this sense is a positive property, from which it follows that Godlikeness is necessarily instantiated, and, if we assume axiom T of modal logic, that Godlikeness is actually instantiated.

A5. $P(NE)$

Th. 3. $\Box\exists xGx$

A Godlike this has every positive property, including "necessary existence". From Theorem 2, we know that G is an essence of any Godlike thing, so, by the definition of necessary existence, it follows that if anything is a Godlike thing, Godlikeness is necessarily instantiated. We know that it is at least possible that there be a Godlike thing (since Godlikeness is positive, and, by Theorem 1, any positive property is possibly instantiated). So, it is possible that Godlikeness is necessarily instantiated. By axiom 5 of standard modal logic, it follows that Godlikeness is necessarily instantiated.

If being identical to x counts as a property of any Godlike thing x, we can prove that there is exactly one Godlike thing, since being identical to Godlike thing x must be a positive property (since, otherwise, not being identical to Godlike thing x would be positive, and thing x would, being Godlike, have to

have it). But this means that every Godlike thing must be identical to thing x, so there can exist only one Godlike thing. Thus, we conclude that God (i.e., the unique godlike thing) exists.

2 Sobel on Modal Collapse

The argument I just gave can be extended (as Sobel proves) to show that God can have only positive properties:

Th. 4. (Sobel) $G(x) \rightarrow \forall F[F(x) \rightarrow P(F)]$

Sobel's principal objection to Gödel's argument is that it engenders "modal collapse": we can use Gödel's axioms to prove that every actual truth is necessarily true – that there is absolutely nothing is contingently true, a disastrous result.

Here is Sobel's proof of modal collapse (p. 157): first, we prove that all of God's properties are necessarily instantiated. Suppose that a Godlike being exists and has property F. Call the Godlike being j. We know, from theorem 2, that G is the essence of j. This means that G necessitates all of j's actual properties. Since j has F, G must necessitate F, and since G is necessarily instantiated, F must also be necessarily instantiated. In fact, the conjunction of F and being identical to j is necessarily instantiated: so j has F in every possible world.

For the proof of modal collapse, let Q be some arbitrary truth. We will show that $\Box Q$. We know, from Gödel's theorem 3, that a Godlike being exists: call it j again. So, we know $G(j)$. We also know, from theorem 2, that G is the essence of j. This means that G necessitates all of j's actual properties. Since Q is true, j has the property of being such that Q (i.e., from $(Q\&j = j)$, we can deduce that j has the property $\hat{x}[Q\&x = x]$). Thus, being G must necessitate being such that Q. Since G is instantiated in every world, it follows that something is such that Q is true in every world. Hence, $\Box Q$.

3 Escaping the Collapse

Of course, the crucial question here is: what are the properties in the domain of Gödel's second-order quantifiers? Sobel assumes that properties are nothing more than functions from possible worlds to sets of things, an extremely liberal conception. On such a conception, the property of being such that Q is unproblematic, since it corresponds to a function from worlds to sets of individuals of the following kind: if Q is true in world W, then $f(W)$ is the set of all individuals in W; if Q is false in W, then $f(W)$ is the empty set. Sobel's liberal interpretation of properties corresponds to his acceptance of an abstraction schema for properties: if μ is an open formula, with free variable x, then there exists a property $\hat{x}[\mu]$.

On the one hand, Gödel's proof does not require anything so powerful as

a generic abstraction schema. In fact, nothing in the proof seems to depend any instance of the schema. On the other hand, there are several reasons for thinking that Gödel himself would have embraced this more liberal abstraction schema. Howard Sobel has pointed (in a conference paper delivered in 2005) to a passage in Gödel's unpublished work that indicates that he would have welcomed modal collapse. [6, p. 435] Furthermore, in "Russell's Mathematical Logic", [5, p. 129n] Gödel endorses a general schema of property abstraction (not, however, in the immediate context of the ontological argument).

However, regardless of what Gödel himself thought, it is clear that modal collapse is a disaster. There are many contingent truths. Consequently, we must, if we are to take Gödel's argument seriously, engage in a project of substantial reconstruction. Before rejecting or emending one or more of Gödel's axioms (as Anderson does), the most conservative response is to restrict the domain of properties. This could be done in a number of ways. We might insist that Gödel's property-variables stand only for a thing's intrinsic properties. The class of intrinsic properties is the class of properties that are qualitative and non-relational: that pertain or fail to pertain to a thing because of its internal constitution. There is nothing in Gödel's argument that rules out this interpretation of his second-order variables. To make his proof work under this interpretation, we need only the following properties of the set of intrinsic properties:

IN1. If F is intrinsic, so is $\neg F$.

IN2. The conjunction of a set of intrinsic properties is itself intrinsic.

IN3. Everything has at least one intrinsic property in every world (satisfied if the property of being self-identical counts as intrinsic), and an impossible property (such as being non-self-identical) counts as intrinsic.

IN1 is required by Gödel's axiom A1, which asserts that the class of properties is closed under negation. Similarly, IN2 is required to underwrite the legitimacy of Gödel's definition of the property G. IN3 and IN4 are consequences of IN1 and IN2, included merely for the sake of illustration.

These are quite plausible assumptions. Furthermore, Gödel's axioms make perfect sense under this new interpretation. We can apply both the logical and the axiological interpretation of positivity to the case of intrinsic properties. Being Godlike is intrinsic, as well as positive, since it consists in an infinite intersection of intrinsic properties. Finally, necessary existence is an intrinsic property, since it consists simply in not having certain intrinsic properties (namely, those that are not necessarily instantiated).

Under this interpretation, Sobel's modal collapse proof does not go through, since being such that snow is white no longer counts as a property (under the intended interpretation) We still have the conclusion that God has all of His intrinsic properties necessarily, but this conclusion would not be unwelcome to theists of a Neo-Platonic bent. Classical theists like Thomists describe God as a being of "pure act", a being whose intrinsic character is utterly free of contingency, and hence absolutely changeless. This of course raises the question of how

such a God could know about or care about contingent matters of fact (such as the plight of the victims of the South Asian tsunami). The standard scholastic answer to this question consists in the claim that God's knowledge about and concern for His creatures requires no internal modification of His being. His love for us simply consists in the loving actions that flow inevitably from God's being to us, and there is no real distinction between God's knowledge of a contingent fact and that fact itself. These are, admittedly, counterintuitive, even paradoxical claims, but to object to the ontological argument on the grounds that it supports the standard, scholastic version of theism, as opposed to a more commonsensical version of it, seems seriously misplaced.

I should also mention, however, that there is one corollary of Gödel's argument that cannot be sustained under the interpretation that limits properties to intrinsic properties. We can no longer prove that there can be only one Godlike being. If j is a Godlike being, then being identical to j (and, equivalently, distinct from everything other than j) cannot plausibly be thought an intrinsic property of j. However, there are other arguments that can be used to rule out, on plausible grounds, the existence of two or more godlike beings. For example, the existence of two omnipotent beings is logically impossible. In addition, trinitarian Christians might find it advantageous to abandon too rigorous a proof of the absolute unicity of God.

If one finds the scholastic model of an impassible and immutable God unattractive, there is at least one more plausible interpretation of Gödel's property

variables. We can take a *property* to be something like a natural kind, or, in Aristotelian terms, a genus or differentia in the category of substance. Again, the facts we need are readily available:

NK1. If F is a natural kind, so is $\neg F$.

NK2. The conjunction of a set of natural-kind properties is itself a natural kind.

NK3. Everything belongs to at least one natural kind in every world (satisfied if the property of being self-identical counts as a natural kind), and an impossible property (such as being non-self-identical) counts as a (vacuous) natural kind.

Consequently, being Godlike surely qualifies as a natural kind, since it is the conjunction of a set of natural kinds. Similarly, necessary existence consists in not belonging to any natural kind that is possibly uninstantiated. Given N1 and N2, this is itself surely a natural kind.

On this interpretation, Sobel's modal collapse argument clearly fails. Being such that snow is white is certainly not a natural kind or the differentia of a natural kind. There is nothing especially shocking about the conclusion that God belongs to whatever natural kinds He does as a matter of necessity.

4 The Fatal Flaw

Thus, Sobel seems to have erred in finding fault with Gödel's arguments on these grounds, and Anderson's emendations, designed to avoid the collapse by substantially modifying Gödel's axioms and definitions, were entirely unnecessary. Nonetheless, I believe that there is a fatal flaw in Gödel's argument, one that both Sobel and Anderson overlooked. The flaw concerns axiom A5, the positivity of necessary existence. Sobel thinks that A5 is plausible under the logical interpretation of positivity: "there seems to be 'no privation' about it." (p. 125). This was an injudicious concession on Sobel's part.

Axiom A5 states simply that "necessary existence", in Gödel's sense, is a positive property. Gödel's necessary existence is provably equivalent to the condition below, the condition of being "contigency free" (or CF).

Def. CF $CF(x) \leftrightarrow \forall F[F(x) \rightarrow \Box\exists yF(y)]$

Equivalently:

$$CF(x) \leftrightarrow \forall F[\Diamond\neg\exists yF(y) \rightarrow \neg Fx]$$

It is easy to prove that CF and NE are necessarily coextensive (on the assumption, which Sobel rightly endorses, that everything necessarily has at least one essence). So, NE is positive if and only if CF is. CF is the property of having *only* necessarily instantiated properties. This entails *not*having any property that is possibly uninstantiated. CF is the equivalent to the infinite conjunction of the members of a set of properties – namely, the set of

complements of those properties that are not necessarily instantiated (i.e., that are possibly uninstantiated). CF is positive iff none of the properties that are possibly uninstantiated are themselves positive. If, instead, there is a positive property F that is *not* necessarily instantiated, then CF entails *not* having F, which would make CF a negative property (any property that entails not having some positive property must itself be negative).

Thus, whether CF (and NE) are positive depends on whether it is true that all positive properties are necessarily instantiated. If some positive property is possibly uninstantiated, then CF and NE are clearly themselves negative. Thus, we have no reason to accept Axiom 5, unless we already believe that all the positive properties (including of course G) are necessarily instantiated. We have no reason to accept Axiom 5 unless we know that God exists necessarily.

Why were Gödel (as well as Sobel and Anderson) taken in by Axiom 5? I think the error lies in confusing a positive property with a property picked out by a positive second-order condition. The condition by which CF is defined is purely positive: in order to belong to the set of which CF is the conjunction, a property must satisfy only the purely positive condition of being a property that is necessarily instantiated. However, this is certainly not sufficient to make CF itself a purely positive property. Consider the property "self-identity completeness". This property consists in having every property that is self-identical:

Def. SIC $SIC(x) \leftrightarrow \forall F[F = F \rightarrow F(x)]$

The second-order condition by which we define SIC is paradigmatically

positive: the property of being self-identical. Yet, SIC itself is certainly negative, since it is logically impossible to have all properties (including, for every F, having both F and $\neg F$). In fact, SIC is paradigmatically negative, since it is equivalent to the first-order property of being non-self-identical, $\hat{x}[x \neq x]$. I think that it's plausible to think that it was just such a confusion between being a positive property and being a property defined by a purely positive condition that led Gödel into the error of proposing Axiom 5 as part of his proof.

So, we don't need to worry about global collapse, and there's nothing seriously wrong with Axioms 1-4. However, without Axiom 5, Gödel's ontological proof is unsuccessful. There is, however, a simple repair that might do the job: replace Axiom 5 with Axiom 6:

A6. $P(F) \rightarrow P(\Box F)$

If a property F is positive, then so is the property of being F in every possible world. Since Godlikeness is positive, it follows that being Godlike in every possible world is also positive. Positive properties are always possibly instantiated, so being necessarily Godlike is possibly instantiated. In S5, it follows that Godlikeness is necessarily, and thus also actually, instantiated. With A6, Gödel's argument becomes a version of the modal argument developed by Malcolm, Hartshorne and Plantinga.

Does A6 suffer from exactly the same flaw as A5? No, but it suffers from a closely related flaw. If there is a positive property F that is possibly uninstantiated, then A6 will fail in that case, since in that case $\Box F$ or, more precisely,

$\hat{x}\Box F(x)$ (being F in every possible world), will be an impossible property, and so negative rather than positive. Thus, A6 presupposes (in the context of S5) that every positive property (including the conjunction of all of them) is instantiated of necessity, but this is just what the ontological argument was supposed to establish. The difference between A5 and A6 is that A6, at least, as some independent plausibility (employing the axiological conception of positiveness). If F is a mode of perfection, then it seems reasonable to think that $\Box F$ would also be desirable. A5 lacks any such appeal. It is, however, doubtful whether this difference amounts to the difference between a successful and unsuccessful piece of natural theology.

5 Appendix: Sobel on My Cosmological Argument

In Appendix C of Chapter 4 [14, pp. 234-7], Sobel offers several criticisms of my version of the cosmological argument [9]. The editors of this journal asked me to add a brief appendix to this article in response. In my paper in *American Philosophical Quarterly*, I developed a version of the the argument for a first cause, based on a principle requiring every *wholly contingent* state of affairs to have a cause. There were several characteristic features to my argument:

- I relied on a principle of causation, rather than a principle of sufficient reason. I assumed that every wholly contingent situation is caused by

a second situation, where the effect necessitates is cause (at the level of tokens) and not vice versa. One could call this a principle of *necessary reason* (as do Hawthorne and Cortens [7]).

- Rather than assuming that contingent things (i.e., enduring substances) require a cause for their existence, I postulated that contingent facts or situations of every kind require a cause for their obtaining actually. The *facts* or *situations* of my theory were not to be identified with true propositions (as Sobel recognized). Instead, they should be thought of as the *truthmakers* of true propositions, comparable to the *situations* of Barwise, Perry and Etchemendy [4][3], the states of affairs of David Armstrong [2], the facta of D. H. Mellor [11], the truthmakers of David Lewis, or the facts of logical atomism[8].

- Instead of assuming that causal regresses are impossible, I followed the strategy of ibn Sina, Scotus and Leibniz by considering the mereological sum of all wholly contingent situations, proving that this sum (the Cosmos) is itself wholly contingent and so in need of a cause, which must be a necessary situation.

- Instead of proposing a deductive proof, I offered my argument as an instance of a defeasible argument. Rather than assuming that every wholly contingent situation has a cause, I merely assumed that we have a strong but rebuttable presumption, in each case of a wholly contingent situa-

tion, that it has a cause. I showed that we could reach the defeasible but undefeated conclusion that there is an uncaused first cause.

- I avoided the paradoxes noted by James Ross[12, pp. 295-304] and William Rowe[13, pp. 108-110], such as the problem of whether God caused that he caused the world, by restricting my causal principle to *wholly contingent* situations, rather than to all contingent situations. The situation of God's causing the world is partly necessary and partly contingent. Its wholly contingent part is simply the Cosmos, and so an infinite regress is avoided.

A few points about "facts" and "situations". The philosophers on whom I was drawing share the idea that there are concrete parts of the world that stand in something like a correspondence relation to true propositions. The atomic situations/facta have a structure that parallels the subject/predicate structure of atomic propositions.

In the case of logical complexity, however, things are different. A true conjunction corresponds to an aggregation or fusion of atomic situations. A true disjunction, in contrast, can be made true by a single atomic situation. There is no need to postulate special "disjunctive" or "existentially generalized" situations. If Smith sues Jones, then the truth-maker of the proposition that someone sued Jones is simply the truthmaker of the proposition that Smith sued Jones. Barwise and Perry referred to this as the "transparency" of situation theory.

5.1 Sobel's First Objection

Sobel's first objection is simply to endorse an objection that I mentioned in my 1997 paper: namely, that all observed cases of causation are cases in which the cause was *contingent*. Our experience would seem to support, not only my causal principle, but also the principle that a contingent situation normally has a contingent cause. The Cosmos must be an excption to this principle: its cause cannot be contingent, since every wholly contingent situation is a part of the Cosmos itself. The fact that Cosmos is an exception to one well-founded defeasible rule gives us some grounds for suspecting that the Cosmos might also be an exception to other rules, including the rule of causality itself. (This is sometimes called a red flag rebuttal in the defeasible reasoning literature: the fact that something is an exception to one rule raises a red flag over the other rules. It is a controversial form of rebuttal: most defeasible logics do not count it as cogent, but Im willing to grant it for the sake of argument.)

In my 2001 paper in *Faith and Philosophy*, I developed further the brief and cryptic response to this objection that was contained in my 1997 paper. Responding to the objection requires a new and improved causal principle: every wholly contingent situation is (normally) caused by a situation that is *more nearly necessary than* it. One situation a is *more nearly necessary* than a situation b just in case the actual obtaining of b (taken as a token, not a type) asymmetrically necessitates the obtaining of a (or, more precisely, every part of

b necessitates a, but a necessitates no part of b).[1] This relation is a strict partial ordering (transitive and irreflexive). In fact, I argue (in my book, *Realism Regained* [10]) that this ordering simply is the causal priority relation. In addition, the assumption that effects necessitate their causes is a straightforward generalization of the Kripkean intuition that the origin of a thing is essential to it, since the 'origin' of a situation is simply its cause.

Finally, the principle that causes are more nearly necessary than their effects seems to be implicit in our conviction that the past is *fixed* and the future is *open*. The relative necessity of causally antecedent tokens gives us an explanation of the asymmetry of past and future. The fixity of the past can best be understood as the relative necessity of past event-tokens, given the token event corresponding to the present. This thesis is implicit in all "branching-future" models of temporal logic.

By this definition of 'more nearly necessary than', a necessary situation is *more nearly necessary than* any wholly contingent one. The Cosmos is *minimally* contingent: the only thing that could be more nearly necessary than it (the only

[1] This principle (an effect necessitates the existence of its causes) does not imply that the *content* or *intrinsic type* of an effect necessitates the *content* or *type* of its causes. For example, the token situation of Caesar's death could not have existed had not all of its causes, including Brutus' knife-thrust, existed. This of course does not mean that Caesar wouldn't have died unless Brutus and the other senators had killed him. The truth 'Caesar died' would have been verified by a different situation in all of those worlds in which Brutus does not help in inflicting the fatal set of wounds. The situation that actually verifies the truth 'Caesar died' would not have existed had any of its causes failed to exist.

thing that could be causally prior to it) is something that is necessary tout court. Hence, we have good reason to expect the Cosmos to be the exception to the principle that contingent situations normally have contingent causes. In fact, the transition from Cosmos to necessary fact is really no exception at all: its exactly what is needed to preserve the generalization intact. This yields the First Cause as a straightforward extrapolation from our ordinary experience of causation.

The new and improved principle both explains why contingent causes are the rule in our experience (only the first cause can be necessary, and the nature of a necessary fact puts it outside our ordinary experience) and why we should expect the Cosmos to be the exception to the rule. This response depends on finding my proposal about causal priority to be a plausible one – which, unsurprisingly, I do. In fact, I would argue that my proposal is simply the natural generalization of the thesis that the past is fixed (assuming that past events are causally prior to present ones).

On the basis of induction, we can confirm that, at every degree of necessity (short of absolute necessity), every token is caused by some token more nearly necessary than it. As we successfully build scientific models that stretch across astronomical and geological time, we confirm that situation-tokens across a wide swath of degrees of necessity have causes that are strictly more nearly necessary than themselves. The new and improved causal principle is the generalization of this pattern (in the form of a defeasible rule). It states that we may reasonably

infer, about any token at any degree of necessity, that it has a causal antecedent which is more nearly necessary than it.

5.2 Sobel's Second Objection

Sobel (understandably, since he had only my cryptic 1997 remarks to work with) finds my response to the previous objection mysterious. He rests his case on his second objection: that it is impossible that a necessary fact (or situation or factum) cause a contingent one. I find it hard here to locate Sobels reason for this claim. At various places he simply asserts that all necessary beings are causally inert. This seems to be a hasty generalization from the necessary beings that hes familiar with: numbers, pure sets, universals. Even if I were to grant that these are causally inert, I cant see how anything like induction by enumeration is reliable here. We dont use any such rule in mathematics, for example (the fact that all the sets were familiar with are finite gives us no reason to think that all sets are finite, for example). The cosmological argument gives us good reason to believe that at least one necessary being is causally active: its not much of an objection to that argument to simply repeat with greater emphasis ones prior belief that its not so.

In any case, I dont accept that mathematical and logical objects (like negation, disjunction and so on) are causally inert. In *Realism Regained*, I give a formal model according to which logical facts (like instances of the necessitation of law of the excluded middle) can have real-world consequences. Facts

about the logical laws impinge on the concrete world by actively preventing contrary-to-logic situations from developing. We discover these impossibilities, and consequently the logical laws behind them, by means of a process of causal interaction with the world (it may be that much of our knowledge in this area is innate rather than learned, but there is still some sort of causal connection to the laws lying behind it). The main advantages to such an account is that it enables us to apply well-supported causal accounts of knowledge and reference to the case of necessary beings.

Sobel may be confusing causation with necessitation. Its quite right, as he shows in his critique of Leibniz, that it is impossible for a necessary being to necessitate or give a sufficient reason for contingent beings. However, thats irrelevant to the question of causation. Similarly, Sobel insists that contingent things cant "matter to" necessary beings: but of course, the question at issue is the converse one: can necessary beings "matter to" contingent ones? Why not?

References

[1] C. Anthony Anderson. Some emendations of gödel's ontological proof. *Faith and Philosophy*, 7:291–303, 1990.

[2] David M. Armstrong. *A World of States of Affairs*. Cambridge University Press, Cambridge, U. K., 1997.

[3] Jon Barwise and John Etchemendy. *The Liar: an essay on truth and circularity*. Oxford University Press, New York, 1987.

[4] Jon Barwise and John Perry. *Situations and Attitudes*. MIT Press, Cambridge, Mass., 1983.

[5] Kurt Gödel. Russell's mathematical logic. In P. A. Schilpp, editor, *The Philosophy of Bertrand Russell*, pages 125–53. Northwestern University Press, Evanston, 1944.

[6] Kurt Gödel. *Collecterd Works*, volume III, Unpublished Essays and Lectures. Oxford University Press, Oxford, 1995.

[7] John Hawthorne-O'Leary and Andrew Cortens. The principle of necessary reason. *Faith and Philosophy*, 10:60–67, 1993.

[8] Herbert Hochberg. *Thought, Fact and Reference*. University of Minnesota, Minneapolis, 1978.

[9] Robert C. Koons. A new look at the cosmological argument. *American Philosophical Quarterly*, 34:193–212, 1997.

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

[11] D. H. Mellor. *The Facts of Causation*. Routledge, London, 1995.

[12] James F. Ross. *Philosophical Theology*. Bobbs-Merrill Co., Inc., Indianapolis, 1969.

[13] William Rowe. *The Cosmological Argument.* Princeton University Press, Princeton, 1975.

[14] Jordan Howard Sobel. *Logic and Theism: Arguments For and Against Belief in God.* Cambridge University Press, Cambridge, UK, 2004.