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HOW TO CREATE A PHYSICAL UNIVERSE *EX NIHILO*

Richard C. Potter

This paper examines the principle of creation *ex nihilo* as formulated by St. Augustine and contrasts it with the common-sense principle that “something cannot come from nothing.” It is argued that these two principles, if suitably interpreted, are *logically consistent* and a creation scenario is described in which their compatibility is demonstrated.

In Book XI of the *Confessions*, St. Augustine is concerned with the question: “What was God doing before *He made heaven and earth?*”

St. Augustine’s famous response is to reject the question on the ground that it is complex—for the question presupposes that there *was* time before the creation of heaven and earth. St. Augustine argues that this presupposition is false by appealing to the principle—which later came to be known as the *Principle of Sufficient Reason*—that God never does anything without good reason. As he sees it, the Principle of Sufficient Reason entails that there could have been no time before the creation of the physical universe, for had there been, God would have had no good reason for selecting one moment of time rather than some other as the time at which to bring heaven and earth into being.¹

I. *The Conflict between the Augustinian Account and Common-Sense*

Yet responding to the question in this way is not without its own peculiar difficulty. For given that there was no time prior to God’s act of creation, it follows that no objects—not even God Himself—existed prior to God’s initial creative action. And from this it follows that there were no pre-existing objects from which God could have fashioned the material universe at the time He brought it into being.

Thus, St. Augustine’s response commits him to the view that God created the world of souls and bodies *ex nihilo*—out of nothing.

We may express St. Augustine’s theory of the creation of the material world in terms of the following proposition, which I shall call the *Ex Nihilo Principle* (ENP). It may be stated as follows:



(ENP) God created contingent objects in such a way that there was a time T1 at which contingent objects came into being, although there was no time prior to T1.

Now the problem with the doctrine of creation *ex nihilo* is notorious. For it is apparently inconsistent with one of our most basic, common-sense beliefs: namely, that something cannot come from nothing. Let us try to formulate this latter thesis more precisely, in order to determine whether it is in fact inconsistent with the Augustinian theory of creation.

As I interpret it, the claim that something cannot come from nothing amounts to the view that whatever comes into being at a certain time must be composed out of things which existed prior to that time.

But what is it for one thing to be composed out of other things? If we allow ourselves the concept of one thing's being a *proper part* of another as undefined, we may say, first of all, that two objects are *discrete* if and only if (a) they are not identical; (b) neither is a proper part of the other; and (c) they share no proper part in common.

Any two things which are spatially separated are discrete. And any two things which are in contact but which could—without gaining or losing any proper part—become spatially separated are also discrete.

In terms of the concept of *discreteness*, we may now say that an object O is *composed* out of certain other things X1...Xn just in case (a) X1...Xn are discrete from each other; (b) X1...Xn are all proper parts of O; and (c) no proper part of O is discrete from every one of X1...Xn.

In other words, object O is composed out of the objects X1...Xn just in case O could be "sliced up," so to speak, into n pieces in such a way that the pieces into which it was sliced were X1...Xn.

We shall say that a *composite* (or a *whole*—I shall use these two terms interchangeably) is simply an object which is composed out of other objects, in the sense just defined.

Thus, consider an ordinary composite, such as my desktop, D. Given our definition, we may say, for example, that D is composed out of its left and right halves. We may also say that D is composed out of its top and bottom halves. Furthermore, we may say that D is composed out of its top and bottom left quarters together with its top and bottom right quarters. For in each case, we have a group of mutually discrete objects, each one of which is a proper part of D, and which are such that no proper part of D is discrete from every one of them.

In short, any conceivable way of "slicing up" D—whether into two, ten, or a thousand pieces—is going to constitute a group of objects out of which D is composed.

Given, then, the concept of one thing's being *composed* out of others, we

may now formulate the thesis that something cannot come from nothing in terms of the following proposition, which I shall call the Principle of Creation by Compounding (PCC):

(PCC) For any object O and any time T, if O comes into being at time T, then there exist some objects out of which O is composed and those objects existed prior to time T.

Thus, according to the Principle of Creation by Compounding, any object O which comes into being is a composite; and there must be some conceivable way of “slicing up” O into a group of objects which has these two properties: (a) O is composed out of the objects in that group and (b) each of the objects in that group existed before O came into being.

Although it may seem as though the truth of this principle is obvious, we will do well to consider the following possible objection:

“It would seem as though the Principle of Creation by Compounding is false since it implies something which is simply untrue: namely, that whatever comes into being gets formed out of a *plurality* of things. But isn’t it possible for one thing X to come into being out of *just one thing* Y? Suppose, for instance, that I take your desktop D and cut it into six pieces and then from those pieces I construct a box, B. Here, B hasn’t come into being out of a plurality of things—it has come into being out of just one thing; namely, D.”

Now it is true, in a sense, that B comes into being out of “just one thing.” It is true in the sense that everything needed to compose B is already contained in one single thing: namely, D. But it is not true in the sense that B is *composed* out of one single thing. For as the objector points out, he imagines cutting D into *six* pieces which are subsequently joined in order to form B. B is thus composed out of those six objects, each of which existed before B came into being (for each of them, at one time, was a proper part of D). Hence, a situation in which we take a single object, break it down, and from the remains construct a new object is consistent with the Principle of Creation by Compounding.

But is St. Augustine’s commitment to the *Ex Nihilo* Principle consistent with the Principle of Creation by Compounding? When we combine these two propositions, the result does seem to be a logically inconsistent set of propositions:

(ENP) God created contingent objects in such a way that there was a time T1 at which contingent objects came into being, although there was no time prior to T1.

(PCC) For any object O and any time T, if O comes into being at time T, then there exist some objects out of which O is composed and those objects existed prior to time T.

It would seem as though these two theses are logically incompatible. For according

to the *Ex Nihilo* Principle, there are certain contingent objects which God creates at a particular time T1; thus, there are certain contingent objects which come into being at time T1 and therefore exist at time T1. Yet there was no time prior to T1. Hence, those objects which God brings into being at that time have evidently not been fashioned out of any *pre-existing* materials. Yet if this is so—that is, if the objects which God creates at time T1 are not composed out of things which existed prior to that time—then the Principle of Creation by Compounding turns out to be false.

II. Approaches to the Problem

St. Augustine evidently took these two principles to be logically incompatible. And so, anxious to salvage his theory of the creation of the physical universe, he felt obliged to give up the Principle of Creation by Compounding. Yet it can hardly be over-stated that by rejecting this principle, he did considerable violence to our common-sense intuitions. For any case of a thing's coming into being with which *we* are familiar is always a case in which one thing comes to exist out of materials which already existed. A house is created by constructing it out of pre-existing wood, brick, nails, and the like; a sculpture is created by bringing together previously existing pieces of stone, metal, or clay; and even the first stage of the body of a human being is created by the uniting of a sperm with an egg, each of which existed prior to their interaction.

We have no concrete experience of anything coming into being without coming into being through the compounding of individuals which already were in being. Thus, nothing in our experience provides a counter-example to the Principle of Creation by Compounding. Indeed, none of our experience provides us with the slightest insight into how it would even be *possible* for there to be a thing which comes into being in such a way that it, together with every one of its proper parts, come into being simultaneously. Obviously, when we ask how God is able to accomplish such a feat, it is hardly illuminating to be informed that "He works in mysterious ways."

Of course, there is another way to respond to the problem—this would be to simply deny St. Augustine's theory of the creation. Indeed, it may seem that the intuitions in favor of the Principle of Creation by Compounding far outweigh those in favor of the *Ex Nihilo* Principle; thus, one might argue that St. Augustine's commitment to this latter thesis is simply untenable. Obviously, *this* proposal would be totally unacceptable to St. Augustine: for opting in favor of this way out forces us either to deny that God is the creator of heaven and earth or else to face, once again, the question with which St. Augustine began: What was God doing before He created those contingent beings which He *did* create? And why did He pick one moment, rather than some other, to be the time of creation?

But is there, from a logical point of view, any other way to deal with the problem? Is the rejection of the *Ex Nihilo* Principle the only plausible response to the charge of inconsistency?

III. A Different Approach

I believe that there is another way out of the difficulty. According to this alternative solution, the alleged inconsistency is apparent only, and not genuine. In other words, there is a way to interpret the two propositions cited so that it is logically possible for them to both be true.

To begin with, let us note that the *Ex Nihilo* Principle is ambiguous. For, depending upon what is understood by the expression: 'a time,' there are two different ways in which to interpret the principle. Compare the following two formulations:

(ENP1) God created contingent objects in such a way that there was an *instant* T1 at which contingent objects came into being, although there was no instant prior to T1.

(ENP2) God created contingent objects in such a way that there was a finite *interval* T1 during which contingent objects came into being, although there was no interval prior to T1 and no instant during T1 at which contingent objects failed to exist.

Now the first version of the *Ex Nihilo* Principle is logically inconsistent with the Principle of Creation by Compounding. For if this version of the *Ex Nihilo* Principle is true, it follows that there was a first instant of time, and that at this first instant there existed contingent beings. But in this event, it cannot be the case that the Principle of Creation by Compounding is also true. For if there is a first instant at which contingent beings exist, then those objects are created without being composed out of pre-existing individuals.

On the other hand, the second version of the *Ex Nihilo* Principle is *not* logically inconsistent with the Principle of Creation by Compounding—not unless, that is, one assumes in addition that every interval of time must begin with some particular instant. Yet it is precisely this further assumption that we must deny if we are to make St. Augustine's theory of creation consistent with our commitment to the Principle of Creation by Compounding. Now to deny that every interval must contain a first instant is to allow that there may have been at least one interval of time which was, so to speak, "open-ended at its beginning."

What is an interval? If we allow ourselves the concept of an *instant* as undefined, then we may understand an *interval* of time to simply be a set S containing at least two instants which has these further properties: (a) every member of S is an instant; (b) any two members of S are such that there is some third member

of S which comes before one of them and after the other; and (c) any instant which comes before one member of S and after some other member of S is itself a member of S.

Thus an interval, so understood, is simply a densely ordered, compact set of instants. An interval which is *open-ended at its beginning* will be an interval which has this further property: for any member of the interval, there is some other member of the interval which comes before it.

Finally, one interval S may be said to *wholly precede* another interval R just in case every member of S comes before every member of R.

Let us suppose, then, that time did have a beginning, as St. Augustine believed, in the following sense: there was a finite interval of time which was such that no interval of time wholly preceded it. But we shall *not* assume that time had a beginning in the sense that there was a first instant of time. Thus, in the situation envisaged, time has this property: although there is a finite interval of time which fails to be wholly preceded by any interval of time, this interval is open-ended at its beginning—it has no member which comes before every other member.

Now can God create the physical universe, if time has this sort of beginning, without violating the Principle of Creation by Compounding? Indeed He can: for at any instant in the interval, there will already exist contingent beings which God can subsequently use in order to compose some further contingent being. Every contingent being will be created out of other individuals which already existed in the interval. In other words, take any particular contingent object X which God creates at some instant in this interval: if one were to ask, “Out of what materials does God create X at that particular instant?” the answer will always be the same: “God created X out of the individuals Y1...Yn, each of which already existed in the interval.” And if we are asked, “But then, assuming that Y1...Yn are themselves created beings, out of what materials did God create Y1...Yn at the instant(s) at which He brought *them* into being?” the answer will be exactly the same: “God created each of them, at the instant He brought each into being, out of individuals which already existed in the interval.”

Since time, we are supposing, begins with an interval which itself is open-ended at its beginning, it follows that there will have been no instant of time at which contingent beings failed to exist; and yet God will have created contingent beings in such a way that there was a time (i.e., an interval open-ended at its beginning) which was not preceded by any interval of time. Thus the *Ex Nihilo* Principle—in its second formulation—is salvaged.

This model of creation *ex nihilo* is, I submit, entirely consistent with the Principle of Creation by Compounding. Since time begins with an interval which is itself open-ended at its beginning, there will be no such thing as “the *first* group of objects” created by God in the creation scenario described. Nevertheless,

everything which comes into being is, at the time it comes into being, composed out of objects which existed prior to that time. Thus, the Principle of Creation by Compounding is not violated.

In this way, therefore, we can provide an account of God's creation of the physical universe *ex nihilo*, without violating our most fundamental (and, I believe, sound) intuition concerning how things come into being.

IV. Some Final Objections Considered

Let us conclude our discussion of St. Augustine's theory of creation *ex nihilo* by considering two potential objections to the account I've sketched.

Objection 1. "According to your view, God creates contingent objects in such a way that no contingent object (or group of such objects) gets created prior to all others. Yet from this it follows that in order for God to create any particular contingent object X, He must first create some other contingent being Y. Yet before He can create Y, God must first create some other contingent being Z, and likewise for Z, and so on *ad infinitum*. In other words, before God can create any particular individual, He must first create something else. But how, then, can God ever get *started* in creating anything at all? Surely, if God is ever, at any time, already in the process of creating, He *must* have started creating at some time. Thus, there is something wrong with your view."

This objection is reminiscent of one of Zeno's famous paradoxes of motion. For consider Achilles, who is supposedly running a race, whose starting point, let's assume, is P1. As Zeno notes, in order for it to be true that Achilles is running the course, Achilles must move to some point, say, Pn, which is beyond the starting point P1. Yet before Achilles can move to point Pn, he must first move to some point between P1 and Pn. Likewise, before he can ever reach that point, he must first move to some point between it and P1; and so on *ad infinitum*. Thus, before Achilles can ever reach any particular point on the course, he must first reach some other point between it and the starting point. And so, Zeno argues, Achilles can never be running, because to be in the process of running requires that one start running—and yet Achilles can never get started.²

Now it is obvious that people *do* run. And so Zeno's argument must be unsound in some way. Where is the flaw in his reasoning? It would seem to reside in his two assumptions: (a) in order to be in the process of running, one must have *started running* and (b) *starting to run* requires that there be some first point that one reaches beyond one's point of departure.

Therefore, we may respond to Zeno's paradox by denying one or the other of these assumptions. If one insists that *starting to run* requires that there be some first point that one reaches beyond one's point of departure, then we shall simply say that one can be in the process of running without ever having started—

in that sense—to run. On the other hand, if one demands that being in the process of running requires one to have started running, then we shall simply deny that *starting to run* implies that there be some first point that one reaches beyond one's point of departure. In this case, we shall say that one has started to run just in case one's running occurs throughout an interval which is not immediately preceded by an interval during which one is running.³

Now if this sort of response to Zeno's paradox is appropriate (and I believe that it is), then we may reply to the original objection in a perfectly analogous way.

If the objector insists that God's *starting to create* requires that there be some contingent beings which He creates prior to all others, then we shall simply deny that in order for God to be in the process of creating, He must have started—in that sense—to create. On the other hand, if the objector demands that God's being in the process of creating requires that He have started creating, then we shall simply deny that *starting to create* requires that there be some contingent beings created prior to all others. In this case, God may be said to have started creating in exactly the way I have suggested: for His being in the process of creating occurs throughout an interval which is not immediately preceded by an interval during which He is creating.

Objection 2. “Let us grant that there need be no particular group of contingent beings which God creates prior to all others. Still, in your creation scenario, you overlook the fact that there is *one* contingent object created by God whose existence is *not* preceded by the existence of any other thing: this is the physical universe itself. For as soon as God starts creating contingent beings, the physical universe itself comes into being. Now since the *Ex Nihilo* Principle implies that there is no time prior to the existence of contingent beings, it follows that nothing exists prior to the existence of the physical universe. But if that is so, then it would seem that when the physical universe comes into being, it is *not* composed out of pre-existing materials. However, this contradicts the Principle of Creation by Compounding; hence, your creation scenario is not really a logical possibility after all.”

This objection presupposes the following two things:

(A1) If God created contingent objects, then He also created the physical universe.

(A2) If God created the physical universe, then He created a contingent object whose existence was not preceded by the existence of any contingent being.

However, whether each of these assumptions is true depends upon the way in which we interpret the sentence ‘God created the physical universe.’ On what I shall call the *non-substantial interpretation*, this sentence is equivalent to the statement ‘God is ultimately causally responsible for the existence of contingent

beings.’ If we take ‘God created the physical universe’ in this way, then (A1) turns out to be true; for (A1) then amounts to the statement ‘If God created contingent objects, then He is ultimately causally responsible for the existence of contingent beings.’

On the other hand, if we take ‘God created the physical universe’ in its non-substantial sense, then (A2) is not obviously true; for (A2) then amounts to the statement ‘If God is ultimately causally responsible for the existence of contingent beings, then He created a contingent object whose existence was not preceded by the existence of any contingent being.’ As I have endeavored to explain, it does seem to be logically possible for God to cause contingent objects to come into being without being required to create any particular such object prior to all others.

Meanwhile, it is also possible to provide what may be called the *substantial interpretation* of the sentence ‘God created the physical universe.’ Taken in this latter way, the sentence is equivalent to the statement ‘God created a contingent object that is “the totality” of all the contingent objects which ever exist.’ If we take ‘God created the physical universe’ in this latter way, then (A2) will turn out to be true; for it will amount to the statement ‘If God created a contingent object that is “the totality” of all the contingent objects which ever exist, then He created a contingent object whose existence was not preceded by the existence of any contingent being.’

However, if we take ‘God created the physical universe’ in its substantial sense in (A1), the result is not obviously true. For on that interpretation, (A1) amounts to the statement ‘If God created contingent objects, then He also created a contingent object that is “the totality” of all the contingent objects which ever exist.’

It is clear that in order for the objection to work, we must be willing to grant that (A1) and (A2) are both true when ‘God created the physical universe’ is interpreted substantially in both. For if (A1) and (A2) so interpreted are both true, then they, in conjunction with the assumption that God created contingent objects, will entail that God created a contingent object whose existence was not preceded by the existence of any contingent being. The objector is quite correct to point out that this consequence will wreak havoc with our creation model. Indeed, it will require that we give up either the *Ex Nihilo* Principle or else the Principle of Creation by Compounding.

But why should we grant that (A1) and (A2) when thus interpreted are both true? In particular, why should we assume that (A1)—when it is taken as equivalent to the statement ‘If God created contingent objects, then He also created a contingent object that is “the totality” of all the contingent objects which ever exist’—is true?

Perhaps it will be argued that whenever several discrete objects co-exist, there

is something which is the “sum” of those objects. In that case, once God creates a certain group of discrete objects at a particular instant, this will entail that their “sum” comes into being at the very same time. However, even if we grant the highly dubious metaphysical principle invoked here, it won’t follow that there is any “sum” of contingent objects which qualifies as “the contingent object that is *the totality* of all the contingent objects which ever exist.” After all, the objector grants the point that there is no particular group of contingent beings which God creates prior to all others in our model. But if there is no such “first group,” then there is no “first sum” of contingent beings. And if there is no “first sum” of contingent beings, then every “sum” will be such that its existence *is* preceded by the existence of some other contingent object—namely, some previously existing “sum” of contingent beings. No such “sum” will ever have been such that it was “the totality” of all the contingent objects which did, do, and will ever exist.

Or perhaps it will be argued that whenever things exist in succession, there is something which is the “succession” of those objects. In that case, since different contingent objects do exist in succession from the very beginning of time, this will entail that their “succession” has existed for just as long as they have. Nevertheless, it still won’t follow that this “succession” of contingent beings qualifies as “the contingent object that is *the totality* of all the contingent objects which ever exist” unless we make the additional assumption that this “succession” of contingent beings is itself a contingent being. However, as far as I can see, to say that there *is* a “succession” of things in which, for example, X is followed by Y and Y is followed by Z, is to say nothing more than that it is *true* that X is followed by Y and that Y is in turn followed by Z. In other words, it seems to me that talk about the “succession” of certain objects is most plausibly construed as talk about the *proposition* which gives a true description of the way in which those things succeed one another. And propositions, we may suppose, are *necessary beings* contemplated by God.⁴

Therefore, I see no reason to suppose that God created contingent objects only if He also created something which is their “totality.”⁵

In conclusion, it’s worth noting that the question ‘How did God create the physical universe *ex nihilo*?’ is itself potentially ambiguous. On the one hand, it could mean the same as ‘How could God have been ultimately causally responsible for the creation *ex nihilo* of contingent objects?’ If we take the question in this way, then the answer, I think, is to invoke the creation scenario described earlier.

But on the other hand, the question could be taken to mean the same as ‘How could God have created *ex nihilo* a contingent object that is “the totality” of all the contingent objects which ever exist?’ If we take the question in this way,

then the proper response, I believe, is to reject it—for its presupposes that there is such a contingent being, and this is by no means obvious.⁶

NOTES

1. St. Augustine, *Confessions*, translated by E. B. Pusey (Chicago: Henry Regnery Co., 1948), Book XI, sections x-xxxi.

2. An excellent discussion of Zeno's paradoxes of motion may be found in Wesley C. Salmon, *Space, Time and Motion* (Encino: Dickenson Publishing Co., 1975), Chapter Two, pp. 31-67.

3. Interval R *immediately precedes* interval S just in case (a) R wholly precedes S and (b) there is no instant which comes after every member of R and before every member of S.

4. For example, Roderick M. Chisholm has shown that any statement which ostensibly refers to a "succession" of objects can be paraphrased in terms of a statement which refers to a proposition entailing that those objects are succeeding each other. Cf. Roderick M. Chisholm, *Person and Object* (La Salle: Open Court Publishing Co., 1976), Appendix B.

5. To be sure, St. Augustine was aware of the view according to which some contingent beings are "successive." Such as *ens successivum* would be, in his words, "a single thing...composed of many, all of which exist not together." However, it's unclear whether St. Augustine was committed to the existence of such objects in his ontology, given the puzzlement he expresses concerning the properties such objects would have. Cf. *Confessions*, Book IV, Chapter XI.

6. An earlier version of this paper was read at the meeting of the Society of Christian Philosophers, held at the University of Dayton, Dayton, OH, on April 9, 1983. I am indebted to William P. Alston, George I. Mavrodes, and an anonymous referee from *Faith and Philosophy* for their helpful criticisms of that earlier version.