

§ 8. Doctrine of Creation
Lecture 5
Arguments for *creatio ex nihilo*

We've been talking about the definition of *creatio ex nihilo*, and I offered three conditions that are necessary and sufficient for something beginning to exist. The third of those was that the events existing at the time *t* is a tensed fact. Someone has asked me to review the difference between the tensed and tenseless theories of time because that's not entirely clear.

These are sometimes called the A-theory versus the B-theory of time. The way you can remember this is that the B-theory is like a loaf of bread (B for bread). So imagine a loaf of bread that is then sliced into particular slices, and all of the slices are equally real and exist in this loaf. Those slices of the loaf of bread are like time slices – this could be 2018, that slice up there might be 2050, this slice back there might be 1950. All of the slices of the loaf of bread are equally real and exist. By contrast, on the tensed theory of time, only the present slice exists. The other slices are unreal; they haven't yet come into being. So only the present (only the now) exists and past and future moments are unreal. If you can remember “B is for bread” then you can remember that the B-theory, or tenseless theory, of time is like a loaf of bread where all the slices are equally real, and the A-theory, or tensed theory, is like a single slice of bread where only one slice (namely, the now, the present, slice) exists.

Since I don't believe in the B-theory of time I've also thought we could have beef or bologna instead of bread. Bologna is sliced up, too, like that, and that would have the additional advantage of seeing that the B-theory isn't right. *[laughter]*

START DISCUSSION

Student: In explaining the B-theory I've used the analogy of flipbook animation. We've all seen maybe an animation of Superman or someone beating someone up. You take the pages and they flip really fast and it looks like Superman is doing something. In those cases, there's not really one Superman – there's several drawings going on.

Dr. Craig: Yes, that's right.

Student: There's just this illusion of a single Superman going on. What do you think of that analogy?

Dr. Craig: I like it. The analogy to the B-theory would be that all of the slices of the book exist – or all the pages of the book exist. In that sense it's like the B-theory of time, the moments which all exist. The interesting thing that your analogy highlights is that the person who exists on one slice is not the same person as who exists on the other slice. You do not endure through time on this view; rather you are a four-dimensional object

and what exists at any time is just a three dimensional slice of you like the drawing of Superman on one page compared to the drawing of Superman on another page. So this view has pretty radical implications about personal identity over time – namely, you're not the same person who walked into the class this morning. You're a different slice of this four-dimensional object.

Student: In the broader sense though, isn't it humans are tensed (A-theory) but for God time is B?

Dr. Craig: Well, I want to refer you back to our lessons on divine eternity and God's relationship to time where we discussed that. This would take us too far afield at this point so I don't want to revisit that. But that was discussed in our lessons on divine eternity which are available at ReasonableFaith.org in the section on Defenders podcasts.¹

Student: I don't necessarily have a question about the difference but I am curious as to why they couldn't both exist?

Dr. Craig: Because they're mutually contradictory with each other. According to the A-theory, the people in 2050 do not in any sense exist, and on the B-theory they do exist and they're just as real as you are. So these are radically different ontologies of what is real. On the A-theory things come into being and go out of being, but on the B-theory nothing really comes into being. Remember I said that on the B-theory of time, to say that the universe had a beginning just means that the loaf which is the universe has a heel on the front edge. There's a heel to the loaf of bread before which there isn't another slice. That's all it means to have a beginning. But it doesn't come into existence at that point the way it would on the A-theory. The difference between the two, I think, lies in the objectivity of temporal becoming. Do things really come to be and pass away, or is that just an illusion like the illusion of motion of Superman as you flip through the pages rapidly?

Student: On the B-theory, how thin can you slice that bread?

Dr. Craig: Instants. You can do it down to instants if you want. If you think of time as a continuum so that between any two points there's always another point, you can have instants of time.

END DISCUSSION

The relevance of this (in case especially some of your visitors are wondering, *What is the relevance of this?*) is that I suggested that the doctrine of creation out of nothing is committed to the tensed theory of time because according to the doctrine of creation there

¹ For example, see Defenders Series 3, Doctrine of God, Lecture 6 at <https://www.reasonablefaith.org/podcasts/defenders-podcast-series-3/s3-doxine-of-god-attributes-of-god/doctrine-of-god-part-6/> (accessed June 24, 2018).

is a state of affairs in the actual world which consists of God existing alone without anything else. He then brings the universe into being. So to say that God creates the universe at a time t is to say that God brings it about that the universe comes into being at time t . I'm convinced that an adequate explication of *creatio ex nihilo* does involve commitment to a tensed, or A-theory, of time.

We now want to turn to arguments for *creatio ex nihilo*. Early church fathers, though they were heavily influenced by Greek philosophy, broke decisively with that Greek tradition concerning one doctrine, and that was *creatio ex nihilo*. They recognized clearly that the Greek view of the eternity of matter was incompatible with the biblical doctrine of *creatio ex nihilo*. They rejected the teachings of Aristotle on that subject. Aristotle argued that the universe is eternal in the past and that matter never began to exist. There evolved a tradition within early Christian theology of defending the doctrine of *creatio ex nihilo*. The last great champion of *creatio ex nihilo* in the pre-Islamic era was the Alexandrian commentator and philosopher John Philoponus – not exactly a household name but nevertheless the fount of the *kalam* cosmological argument. Philoponus developed all sorts of fascinating arguments aimed at proving the finitude of the past and the impossibility of an infinite regress of past events and thus a beginning of the universe in support of *creatio ex nihilo*. When Islam swept across North Africa they absorbed this tradition, and these arguments were taken up and developed with great sophistication by medieval Islamic theologians. These Islamic thinkers lived side by side with Jewish theologians in Muslim Spain. By the mediation of the Jews these arguments then were reintroduced into Christian Europe where they became the subject of much controversy, pitting, for example, such great thinkers as Saint Bonaventure, who supported the arguments for *creatio ex nihilo*, against Thomas Aquinas, who thought that they were mere probability arguments and not strict demonstrations and therefore should not be used in Christian theology.

Eventually this tradition of argumentation came to something of a sputtering close in the work of the great German philosopher Immanuel Kant in his *Critique of Pure Reason* published in 1781. In the so-called first antinomy concerning time, Kant argues that time cannot be infinite in the past and that the series of past events must therefore have had a beginning. This is, I think, undoubtedly the most visible legacy of this tradition.

These arguments, when reformulated in light of modern thought, I think are of great interest. They have become especially relevant in light of twentieth-century cosmology which seems to provide empirical evidence for the finitude of the past and the beginning of the universe. There are philosophical arguments and scientific confirmation for this key premise that the universe began to exist.

We've covered this so-called *kalam* cosmological argument when we discussed arguments for the existence of God. *kalam* is the Arabic word which denotes medieval Islamic theology. In view of the contribution of these Muslim theologians to this version of the argument I have dubbed it the *kalam* cosmological argument. Since we've already covered these, I don't want to go into them in detail now. I'll just review them very briefly and refer you to our discussion at ReasonableFaith.org in the Defenders class on the excursus on natural theology where we talk about arguments for God's existence.²

I presented two philosophical arguments in support of the beginning of the universe. The first is the argument based on the impossibility of the existence of an actually infinite number of things. The argument here is that an actually infinite number of things leads to inherently paradoxical counterintuitive situations that cannot be instantiated in reality. But if the universe is past-eternal then an actually infinite number of past events has been instantiated in reality. It would follow from this that therefore the series of past events cannot be actually infinite. It must be finite. Therefore the universe began to exist.

The second philosophical argument is quite independent of that. It doesn't presuppose that an actually infinite number of things cannot exist. Rather, the second argument says that a collection having an actually infinite number of members cannot be formed by successive addition, that is to say, by adding one member at a time. The only way that God could create an actually infinite number of things would be by creating them all at once – *Let there be!* – and there would be an actually infinite number of things. But even God couldn't create it by adding one member at a time because, if you try to think about counting to infinity, for any number N that you pick, $N+1$ is always going to be a finite number. You're never going to arrive at infinity. Similarly, trying to count down from infinity seems even more bizarre. To imagine that never having begun one could count down to the present moment would be like counting down all of the negative numbers and ending at zero which is an intuitively bizarre task and leads to all sorts of absurdities. If an A-theory of time is correct then the series of past events has been formed by successive addition. The past does not exist whole and entire; rather it has come to be one event at a time, one event happening upon the heels of the others as things come into being and pass away. So on an A-theory of time, the series of past events is a collection of items formed by successive addition. And since no such collection can be actually infinite, it follows that the collection of past events must be finite and therefore began to exist.

That is, as I say, a very quick capsule summary of these two arguments.

² See Defenders Series 3, Excursus on Natural Theology, Lecture 8 at <https://www.reasonablefaith.org/podcasts/defenders-podcast-series-3/s3-excursus-on-natural-theology/excursus-on-natural-theology-part-8/> (accessed June 24, 2018).

If that were not enough, we now have very powerful scientific confirmation of the arguments for the finitude of the past and the beginning of the universe. These are listed as two in number. First is Big Bang cosmology. Prior to the 1920s, the standard view in science was that the universe is eternal. It just exists and never began to exist. But when Einstein applied his general theory of relativity to the universe as a whole, what he was shocked to discover is that such a stable, static universe is impossible. The universe would either be in a state of cosmic expansion or else a cosmic implosion collapsing in upon itself. By taking this aspect of the theory seriously, scientists in the early 20s were able to formulate models of an expanding universe. As you trace the expansion of the universe back in time, the universe grows denser and denser and denser until finally you arrive at a point of infinite density before which the universe did not exist. This represents a boundary to space and time. On the standard Big Bang model, not only all matter and energy but physical space and time themselves come into being at the Big Bang. The standard model will need to be revised in certain ways as is well-known, but none of these revisions serves to undo the fundamental prediction of the finitude of the past and the beginning of the universe. Indeed, according to Alexander Vilenkin, a very famous cosmologist at Tufts University, there simply are no tenable models of the universe that are beginningless. He says that this gives us confidence that such models simply cannot be developed. Any empirically and mathematically adequate model of the universe will involve a beginning.

Secondly, we have the evidence of thermodynamics. When the laws of thermodynamics are applied to the universe as a whole, you find that the universe is increasing in its entropy – that is the amount of unusable energy. Given enough time eventually all the stars will burn out and all matter will collapse into dead stars and black holes. Eventually the black holes themselves may evaporate. The universe will become nothing but an ultra-thin gas of elementary particles endlessly expanding into endless darkness and the cold recesses of space. There will be no heat, there will be no life, there will be no light. Only the thin gas of elementary particles expanding into the infinite blackness. The question is: if, given enough time, this will happen then why has it not already happened if the universe is infinite in the past? Given the infinitude of past time, the universe should now be in a dark, dilute, lifeless state. But it's not. It's in a state of disequilibrium. This suggests that the universe, in fact, began to exist, and that its initial low entropy condition was simply put in as an initial condition and it has been winding down since that point until today. So the evidence of thermodynamics also supports the notion that the universe began to exist just as Big Bang cosmology says.

START DISCUSSION

Student: I followed what you said, and it made complete sense. Just one question on infinite – we can't have an infinite number of things. The Big Bang model (which I know

what it is but I don't really know the science) – how can you have a point of infinite density that it all starts from?

Dr. Craig: Very good question. I would say that this initial singularity or point at which spacetime curvature becomes infinite is a mathematical idealization. I do not think that it is a physical state of reality, but it represents the point at which the time-reversed universe disappears. So it's an idealization.

Student: I know someone like Oppy would take the singularity to not be an idealization but something physical, so how do you distinguish between what's an idealization and what isn't? The second part of the question was: you equate the boundary point of the universe with the beginning of the universe, whereas I know a lot of cosmologists want to say, no, there's an area of quantum gravity that preceded that.

Dr. Craig: Let's take the second question first. On the standard Big Bang model, quantum effects are not taken into account. So general relativity predicts that the universe will shrink back to this beginning point $t=0$ which is this singular point, and it is true what I said that on the standard model the singularity represents the beginning of the universe. But general relativity breaks down when you get to certain extreme densities, and so scientists are trying to find a quantum theory of gravity that would enable us to describe this earliest split-second of the universe. People like James Hartle and Stephen Hawking have proposed a model in which the initial singularity is rounded off rather like a badminton birdie so that the universe does not reach a singular point and the laws of physics can describe the universe all the way back. But nonetheless, as you note, the universe still has a beginning on this model. Vilenkin, himself is a quantum cosmologist, who says, as I indicated, that there are no models (quantum or otherwise) that are beginningless that are adequate. Any adequate theory, such as perhaps the Hartle-Hawking model, though in not having a singular boundary point will still be finite in the past and have a beginning. So although my explication of this point appealed to the standard model, as I said the standard model will need to be revised. But those revisions are not such as to annul the fundamental prediction that the universe began to exist. So, in response to that first point, you don't really need the singularity to be real or not. It's probably not real because it's based on the general theory of relativity and it represents simply a mathematical point.

Student: It seems to me like you have to be talking about parallel universes. How can you have like model B if you don't have space? If the universe is expanding, what's it expanding in?

Dr. Craig: Oh, all right. Good question. When theorists talk about the universe expanding, they are not presupposing that it's embedded in some higher dimension into which it is expanding. That would be illicit. That would be to posit some space above

space in which our universe is expanding. Rather, think of it in this way. Think about a globe. Imagine that there are buttons glued onto the surface of this globe. As time goes on, the globe gets bigger in the sense that these buttons recede from one another and grow farther and farther apart as time goes on. It is in this internal sense that the universe is expanding. The distance between these fundamental particles, like these buttons here, grows with time. But you should not think that this globe is embedded in a higher dimension into which it is expanding. It is an internal analysis of the expansion that they're talking about, not that there is something out there into which space is expanding.

Student: With this rounded model, you've got the cone that's rounded. Is it still nothing in the beginning? There's nothing? That's a difficult concept.

Dr. Craig: We're going to talk a little bit more about that later but it is still true that there . . . Imagine the South Pole here on this rounded hemisphere. There's nothing prior to that South Pole. There's no time, there's no space, there's no matter, no energy. Hawking will call it the beginning of the universe. It's just not a singular beginning. It's not a boundary point. It's like any other point in spacetime. But, yes, this is still *creatio ex nihilo* in the sense that there is not anything prior to this point. Remember – this is so crucial – that when we talk about *creatio ex nihilo* we do not mean that there was a state prior to the universe and that was a state of nothing. That would be to posit something instead of nothing. Rather, to say that the universe is created *ex nihilo* means that the universe began to exist at a point and there was not anything prior to that point. That's our definition of what it means to begin to exist. Remember? *e* exists at time *t*, and *t* is the first time at which *e* exists. That's true on these models as well.

Student: Could you remind me what state God was in at that point?

Dr. Craig: Well, this is disputed among Christian theologians. Some Christian theologians, as I think someone was alluding to, believe that God is strictly timeless. Other theologians think no, God is in time. He has an infinite past and an infinite future and that he is infinite throughout time – omnitemporal, if you will. My view is a kind of hybrid view. I think that God is timeless *sans* creation, and in time subsequent to creation. So I would say that God existing alone is changeless and timeless, but with the creation of the first event God enters into time in virtue of his relationship with that event and every event thereafter. So God is timeless *sans* creation and in time since creation. Again, I want to refer you back to the Defenders lectures on the attributes of God when we talked about God's eternity and his relationship to time. That's at ReasonableFaith.org under the Defenders series.

Student: How is that different from a Christian idealist view of God and time in the universe?

Dr. Craig: Well, now, I think that many Christian idealists would probably think of God as being strictly timeless and that God doesn't exist in time. There aren't very many of those folks around today. I'm trying to think back to classical German idealists, and I think that the prevailing view would probably be divine timelessness. But don't hold me to it. They are welcome to develop their own models of divine eternity.

Student: I guess it's semantics, but when you say there was nothing when God created, God's Spirit was there but it wasn't in anything. It was just God.

Dr. Craig: I don't think I said there was nothing. What I said is there's nothing prior to that point. That's even true of God because God isn't prior to that point. Right? Otherwise there would be time, and yet this is the beginning of time. God's priority to the Big Bang is a causal priority. It's not a chronological priority. Right? Because time begins at $t=0$, so God doesn't exist prior to the Big Bang in a chronological sense. But he is causally prior, or explanatorily prior, to the Big Bang even if in such a state of isolation he is strictly timeless.

Student: I don't really have much of a background in science but I was thinking about what you said in terms of if we indulge the death of the universe then wouldn't this at some point have already happened and we would already be in a frozen wasteland of sorts. If we do indulge this idea of heat death where we've maximized entropy and we have no thermodynamically free energy and this could have happened before, would that mean that . . . I guess I'm struggling to see how the universe could come into being after that point if you have no heat in order to create work.

Dr. Craig: Oh, I think you're quite right. During the 1960s, some cosmologists who were very uncomfortable with the standard Big Bang model and the beginning of the universe tried to escape this by saying maybe the universe oscillates and it expands and then contracts, expands and then contracts, expands and contracts, like an accordion from eternity past so that as you trace the expansion of the universe back in time – [*Dr. Craig draws figure 1 on the whiteboard*] letting the horizontal line here be time – the expansions of the universe would be rather like this going back to eternity.

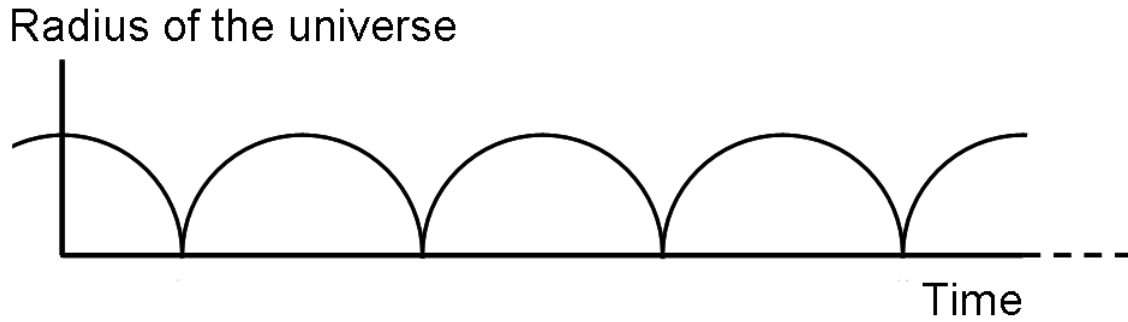


Figure 1

But what they failed to realize is that entropy is conserved from cycle to cycle. This has the effect of generating a longer expansion time and a larger expansion radius with each successive cycle. So, in fact, the way the universe would look would be like this [Dr. Craig draws figure 2 on the whiteboard], and therefore it would still have an initial smallest first cycle and a beginning.

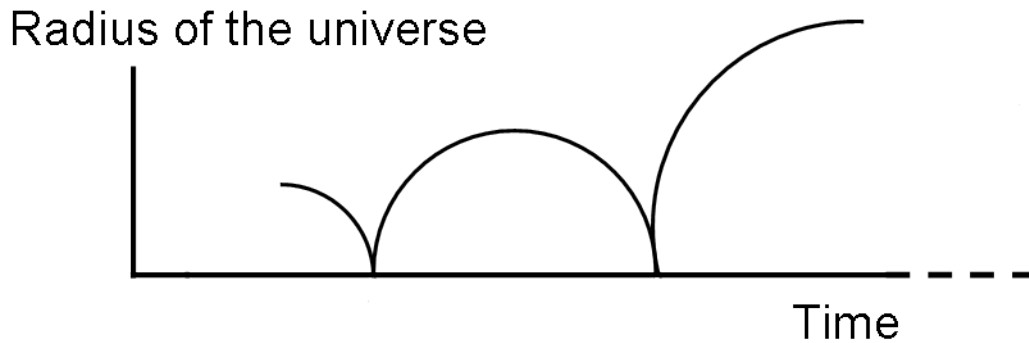


Figure 2

In fact, Joseph Silk, the astronomer, estimates that the universe cannot have gone through more than about 150 prior oscillations based on the current entropy levels in the universe. Even if it could oscillate, it couldn't have done so from eternity. This model would also involve a fine-tuning of an extremely bizarre and infinite precise character to enable the universe to match each expansion and contraction exactly right rather than exploding into an unending expansion at some point. So these oscillating models are really out of favor now.

END DISCUSSION

What we will do next time then, having just briefly reviewed these arguments for creation out of nothing, is we will look at objections to *creatio ex nihilo*. I think you'll find that

some of these are very entertaining because I've taken some of them from the Internet as well as from scientists like Lawrence Krauss and Stephen Hawking. We'll see what objections have been offered to the doctrine of *creatio ex nihilo*.³