

§ 8. Doctrine of Creation
Lecture 7
More Objections to *creatio ex nihilo*

We've been talking about objections to *creatio ex nihilo*, and we ended our time in our last lesson by looking at the objection that quantum physics can show that things can come into being from nothing and therefore no creation is needed in order for the universe to come into existence out of nothing. You'll recall I quoted Lawrence Krauss, a physicist, to this effect. He writes,

In fact, one of the things about quantum mechanics is, nothing—not only can nothing become something, nothing always becomes something. Nothing is unstable. Nothing will always produce something in quantum mechanics. And if you apply quantum mechanics to gravity, you can show that it's possible that space and time themselves can come into existence when nothing existed before. So that's not a problem.¹

I explained that these sorts of claims mistakenly take the word “nothing” to be a singular term referring to something, for example the quantum vacuum or quantum mechanical fields. These are physical realities and therefore most emphatically not nothing. They are clearly something. Therefore, to call these realities nothing (as Krauss does) is at best misleading and at worst is a deliberate misrepresentation of science.

In his review of Krauss' book, *A Universe from Nothing*, David Albert, who is a very eminent philosopher of quantum physics, explains:

. . . quantum . . . states are particular arrangements of elementary physical stuff. . .
. The fact that some arrangements of fields happen to correspond to the existence of particles and some don't is not a whit more mysterious than the fact that some of the possible arrangements of my fingers happen to correspond to the existence of a fist and some don't. And the fact that particles can pop in and out of existence, over time, as those fields rearrange themselves, is not a whit more mysterious than the fact that fists can pop in and out of existence . . . as my fingers rearrange themselves. And none of these poppings . . . amount to anything even remotely in the neighborhood of a creation from nothing.²

¹ For a video of this debate see <https://www.reasonablefaith.org/videos/interviews-panels/craig-vs.-krauss-north-carolina-state-university/> specifically at the 38 minute, 43 second mark. A transcript of this debate can be found at <https://www.reasonablefaith.org/media/debates/the-craig-krauss-debate-at-north-carolina-state-university/> (links accessed July 1, 2018).

² David Albert, “On the Origin of Everything,” critical notice of *A Universe from Nothing* by Lawrence Krauss, *New York Times Sunday Book Review*, March 23, 2012. See <https://www.nytimes.com/2012/03/25/books/review/a-universe-from-nothing-by-lawrence-m-krauss.html> (accessed July 17, 2018).

Albert concludes, “Krauss is dead wrong and his religious and philosophical critics are absolutely right.”

START DISCUSSION

Dr. Craig: Yes, I'd be interested to hear what you, a quantum chemist at Georgia Tech, might have to say about this!

Student: I'll just second this rebuttal to Krauss' argument. In science you see these particles appearing and you think, *Gee, that's amazing! How do they appear out of nothing?* And then you quickly learn they didn't appear out of nothing; they appear out of this Dirac sea or whatever fields you're talking about for the particular particles. And then you say, *Oh, well, sure, OK, then it's perfectly fine.* And when they appear they have to obey all sorts of laws. They have to obey various conservation laws. So it's just part of physics. But none of it makes any sense until you understand that there is this quantum vacuum that they're coming out of, and then you learn the rules for that. It's absolutely not nothing.

Dr. Craig: Yeah, and wouldn't you agree that not only do they obey laws subsequent to their coming into being but their very coming into existence is law-like?

Student: Yeah, exactly. The way they appear, absolutely. They obey certain laws of physics. It's not random or whatever. There are laws that govern all of this, and there are fields that govern all of this, and none of it could happen unless those were there.

Dr. Craig: I think the truth of the matter is that Krauss knows this. He knows it, but he is deliberately misrepresenting the situation so as to be provocative and sell his book and get people interested in cosmology.

Student: Another physics-based objection to Krauss – he talks about applying quantum physics to gravity. Well, the big problem in modern-day physics is you can't apply quantum physics to gravity. We don't have that theory yet. We don't understand . . . our current understanding, our relativistic understanding of gravity and quantum mechanics are mutually contradictory. We don't know how to apply quantum physics.

Dr. Craig: That's a very good point that I'm glad you brought out. Krauss represents a situation as though we have a quantum theory of gravity when in fact we don't. The entire edifice of modern physics is built on the twin pillars of general theory of relativity (which is a theory of gravity) and quantum mechanics (which is your subatomic physics). And as you say, unfortunately they're incompatible with each other. It is an open question yet how to blend or merge these together to have a completely unified physics. You're right. Krauss' conjectures here are way overblown scientifically besides being philosophically inept.

END DISCUSSION

I'd like to go on now to a sixth objection which is a different proposal as to how the universe could come into being from literally nothing, and this proposal comes from the very prominent astrophysicist and cosmologist Alex Vilenkin of Tufts University. Vilenkin has been persistent in arguing that the scientific evidence makes it virtually unavoidable that the universe began to exist. You can avoid the beginning of the universe but only at the expense of conjectures that are scientifically implausible and therefore do not provide a good model for the beginninglessness of the universe. The theorem that Vilenkin helped to craft that shows the beginning of the universe is called the Borde-Guth-Vilenkin theorem (for short, the BGV theorem). The Borde-Guth-Vilenkin theorem states that any universe which is, on average, in a state of cosmic expansion over its history cannot be infinite in the past but must reach a past space-time boundary.

Vilenkin, interestingly enough, is aware of the *kalam* cosmological argument. I have met Vilenkin and corresponded with him. He has actually interacted with the *kalam* argument in print. In response to the claim that the beginning of the universe requires a supernatural cause he says the following:

Regarding the BGV theorem and its relation to God, I think the theorem implies the existence of a rather special state at the past boundary of classical spacetime. Some mechanism is required to impose this state. Craig wants this mechanism to be God, but I think quantum cosmology would do just as well.³

So what is Vilenkin's proposal here? What does he have in mind when he says that quantum cosmology will do just as well in explaining the origin of the universe from nothing? Well, in an article published in the online magazine *Inference* in the fall of 2015 Vilenkin explains his proposal.⁴ Vilenkin writes,

Modern physics can describe the emergence of the universe as a physical process that does not require a cause.

Nothing can be created from nothing, says Lucretius, if only because the conservation of energy makes it impossible to create nothing[sic?] from nothing.

Here I think he means to say “something.” I think this is a slip on Vilenkin’s part. The conservation of energy makes it impossible to create something from nothing. He cannot mean it makes it impossible to create nothing from nothing, because he's just said from Lucretius that nothing can be created from nothing. So I feel quite certain that this was a

³ Alexander Vilenkin to Alan Guth, March 20, 2017. I am grateful to Daniel Came for sharing with me this correspondence, in which Vilenkin strongly rejects Guth’s claim of a beginningless universe on the basis of time-reversal models.

⁴ Alexander Vilenkin, “The Beginning of the Universe,” *Inference: International Review of Science* 1/ 4 (Oct. 23, 2015), <http://inference-review.com/article/the-beginning-of-the-universe> (accessed July 17, 2018).

slip of the pen here and what Vilenkin means to say is the conservation of energy makes it impossible to create something from nothing.

Now, what is he talking about here? Well, he says in the first sentence that modern physics can explain the origin of the universe in such a way that the beginning of the universe doesn't require a cause, and then he quotes the ancient Roman philosopher Lucretius. Lucretius was a Roman philosopher who lived during the first century before Christ. He wrote a book called *De Rerum Natura – On the Nature of Things*. In *De Rerum Natura* Lucretius argued that it's impossible for something to be created from nothing. Vilenkin accurately quotes Lucretius in the second sentence – “nothing can be created from nothing” and by the word “nothing” here Lucretius is using the word properly. He is not using it the way Krauss did as a singular term referring to something. What Lucretius meant is that it's impossible for anything to be created from nothing so that nothing at all (not anything) can be created from nothing according to Lucretius. And then Vilenkin gives (obviously not Lucretius') a reason for thinking this, but appeals to the modern law of the conservation of energy which says that energy can be neither created nor destroyed; that in every process the energy is conserved and therefore energy cannot be created or destroyed. Vilenkin says the conservation of energy would make it impossible to create something from nothing because then you would have energy created which is impossible according to the conservation of energy. So the opening paragraph gives the argument as to why there needs to be a cause for the beginning of the universe. The reason ostensibly is that something cannot be created from nothing because that would violate the conservation of energy, and therefore you need to have a cause which would create the universe.

Now in the second paragraph Vilenkin goes on to say there's a loophole in this reasoning. He's going to dispute Lucretius' argument, and this is what he has to say:

There is a loophole in this reasoning. The energy of the gravitational field is negative; it is conceivable that this negative energy could compensate for the positive energy of matter, making the total energy of the cosmos equal to zero.

So what he's saying is that the energy that's associated with the gravitational field is negative energy whereas the energy that's associated with matter is positive energy, and it's possible that these two cancel each other out exactly with no leftover – that the positive and negative energy exactly cancel each other out so that on balance the total energy of the universe is zero. Then he goes on to say,

In fact, this is precisely what happens in a closed universe, in which the space closes on itself, like the surface of a sphere.

What he has in mind here would be a closed space like the surface of a sphere. This spherical surface is finite, and if the universe is like that (if the universe is like the surface

of a sphere – the three-dimensional analogy to the two-dimensional surface of a sphere) then he says the total energy has to be zero. This is exactly what happens in such a closed universe in which the universe or space is like the surface of a sphere. He says,

It follows from the laws of general relativity that the total energy of such a universe is necessarily equal to zero. . . .

So if our universe is not open geometrically (if it's closed geometrically like the surface of a sphere, which is finite) then he says necessarily general relativity requires that the positive and negative energy balance each other out and so the total energy of the universe is zero. Alright. What's the implication of that? Well, the third paragraph:

If all the conserved numbers of a closed universe are equal to zero, then there is nothing to prevent such a universe from being spontaneously created out of nothing.

It wouldn't violate the conservation laws because the total energy of the universe is zero and so he says that there would be nothing to prevent the universe from popping into being from nothing.

Then he goes on to say,

And according to quantum mechanics, any process which is not strictly forbidden by the conservation laws will happen with some probability. . . .

However remote, given the laws of quantum mechanics, any process or event that is not ruled out (that is not forbidden by these conservation laws) will happen sooner or later.

So he concludes,

What causes the universe to pop out of nothing? No cause is needed.

It just happens.

Well, now, I think this is a terrible argument. Let's grant for the sake of argument the supposition that the positive energy associated with matter is exactly counter balanced by the negative energy associated with gravity so that on balance the total energy of the universe is zero. We'll grant that for the sake of argument. Vilenkin's key move comes with the claim that in such a case, "There is nothing to prevent such a universe from being spontaneously created out of nothing." Now think about that. There is nothing to *prevent* such a universe from being spontaneously created out of nothing. This claim is a triviality. Necessarily, if there is nothing then there is nothing to prevent the universe from coming into being. By the same token, if there is nothing then there is nothing to *permit* the universe to come into being from nothing. If there were anything to prevent or to permit the universe's coming into being then there would be something, not nothing. If there is nothing then there is nothing, period. As our British friends would say: full-stop.

But the whole argument is misconceived in the sense of saying that in order for the universe to originate out of nothing – to be metaphysically impossible – there needs to be something to prevent it which is simply wrong. The absence of anything to prevent the universe's coming into being doesn't imply the metaphysical possibility of the universe's coming into being from nothing.

To give an illustration. If there were nothing then there would be nothing to prevent God's coming into being without a cause. Right? If there were nothing then there would be nothing to prevent God's coming into being without a cause. But that doesn't entail that such a thing is metaphysically possible. It's metaphysically impossible for God to come into being. It is necessarily true that God cannot come into being with or without a cause even if there were nothing to prevent this because nothing exists. Vilenkin, however, infers, "No cause is needed for the universe's coming into being because the conservation laws would not prevent it." According to quantum mechanics, any process which is not strictly forbidden by the conservation laws will happen.

His argument here assumes that if there were nothing then both the conservation laws and quantum physical laws would still hold. If you think about it, that's far from obvious. In the absence of anything at all it's not clear why the laws governing our universe would hold. Why would the conservation laws and the quantum mechanical laws be valid if there were truly nothing? But in any case, why think that, given the laws of quantum mechanics, anything not strictly forbidden by the conservation laws will inevitably happen? For example, the conservation laws do not strictly forbid God's sending everybody to heaven. But I don't think that gives great grounds for optimism about people's salvation. Neither do the laws forbid God's sending everybody to hell, in which case both outcomes will occur. That's logically impossible because they are logically contrary universal generalizations. It cannot both be the case that everybody goes to heaven and everybody goes to hell, and yet neither of these is strictly forbidden by the conservation laws and so they should both happen. We can make the same point non-theologically as well. The conservation laws do not strictly forbid something's coming into existence but neither do they forbid nothing's coming into existence. But both cannot happen. It's logically absurd to think that because something is not forbidden by the conservation laws it will therefore inevitably happen.

Finally, Vilenkin's inference that because the positive and the negative energy in the universe sum to zero therefore no cause of the universe's coming into being is needed is difficult to take seriously. This is like saying that if your debts exactly balance your assets then your net worth is zero and therefore there need be no cause of your financial situation. Vilenkin would, I hope, not agree with Peter Atkins that because the positive and negative energy of the universe sum to zero therefore nothing exists now and so to

quote Atkins, “Nothing did indeed come from nothing”⁵ because nothing exists according to Atkins. As Descartes has taught us, I, at least, undeniably exist and so something exists. Christopher Isham, who is Great Britain's premier quantum cosmologist, has pointed out that even if the positive and negative energy of the universe sum to zero there still needs to be what he calls “ontic seeding” in order to create the positive and negative energy in the first place even if on balance its sum is zero.⁶ Even if we were to concede that the material cause of the universe is not needed, the need for an efficient cause of the universe, I think, is patent.

START DISCUSSION

Student: This is a little bit of a clarification for the scientifically not-so-astute like myself. When we're talking about the energy of matter in this discussion it seems to me like that would be something rather than nothing. Is that not true?

Dr. Craig: It's a sort of mathematical trick that he's talking about. Think of my analogy of your assets and debits. If your assets and debits exactly balance then your net worth is zero. But does that mean that you have no money in your wallet? No. It's just your debts cancel it out. Similarly, of course the positive energy is something and the negative energy is something even if on balance the sum of them is zero. So I think that's why Isham is quite right in saying even if they do sum to zero (for example, in a closed universe) there's got to be some cause of the positive and negative energy in the first place. To me, that is just patent.

Student: My big question is this: does all this mean that God is required to follow the laws of this universe or can he do things arbitrarily that he wants to do? When Lazarus came out of the grave, that was something that didn't fit any physics.

Dr. Craig: Right. Clearly, God transcends the laws of nature and could have created a universe with a different set of laws of nature. And when he does miracles, he does things that are beyond the causal capacity of nature. So those of us who believe in a transcendent creator of the universe do not believe that God is bound by the laws of nature. So I don't think Vilenkin's argument is an argument to say that God could not cause the universe. I think his argument should be interpreted more defensively. He's not arguing against God. What he's arguing is that you don't need God; that you can get something from nothing and therefore you don't need a creator. This is very similar to Stephen Hawking's statement, “What need then for a creator?” Contrary to popular impression, Hawking is not arguing against God. He's not arguing for atheism. He's just

⁵ From our debate posted at <http://www.reasonablefaith.org/debate-transcript-what-is-the-evidence-for-against-the-existence-of-god> (accessed July 17, 2018); cf. Peter Atkins, *Creation Revisited* (New York: W. H. Freeman, 1992).

⁶ Christopher Isham, “Quantum Cosmology and the Origin of the Universe,” lecture presented at the conference “Cosmos and Creation,” Cambridge University, 14 July 1994.

questioning what need is there for a creator if quantum physics can explain the origin of the universe from nothing. What I'm suggesting is that, when you look at it carefully, Vilenkin's argument is really a terrible argument that goes wrong at several points.

END DISCUSSION

That brings us to the end of today's lesson and our discussion of objections to *creatio ex nihilo*.⁷