

Second Philosophical Argument

We have been looking at the *kalam* cosmological argument for God's existence. Last time we began studying the philosophical arguments in support of the crucial second premise that *the universe began to exist*.

We looked at Ghazali's first philosophical argument based upon the impossibility of the existence of an actually infinite number of things. But he has a second philosophical argument as well. This argument is independent of the first argument. That is to say, even if you think that an actually infinite number of things can exist, this argument aspires to show that the series of past events cannot be actually infinite.

The series of past events, Ghazali observes, has been formed by adding one event after another. The series of events in the past is like a sequence of dominoes falling one after another until the last domino, today, is finally reached. But, he argues, no series which is formed by adding one member after another can be actually infinite, for you cannot pass through an infinite number of elements one element at a time.

I think this is easy to see in the case of trying to count to infinity. No matter how high you count there is always an infinity of numbers left to count. Therefore no one can count to infinity. He can go on and on, but infinity will simply be a limit to the series of numbers he counts, but he will never arrive at infinity.

But if you cannot count *to* infinity, how can you count down *from* infinity? This would be like someone's claiming to have counted down all of the negative numbers ending at 0: . . . , -3, -2, -1, 0. That seems crazy, for before he could count 0, he would have to

count -1. But before he could count -1, he would have to count -2. But before he could count -2, he would have to count -3. And so on and so on, back to infinity. Before any number could be counted an infinity of numbers would already have to have been counted first. So you just get driven back and back into the past, so that no number could ever be counted. But then the final domino would never fall if an infinite number of dominoes had to fall first. So today could never be reached. But obviously here we are. This shows that the series of past events must be finite and have had a beginning.

Here is a response that is sometimes given. They will say, *Look, any negative number you pick is only a finite distance from zero, whether it is -3 or -10 trillion or whatever.* So you could count down from that number to 0. If you have an infinite number of negative numbers, you can count down to 0 from every one of them. So if from every number you could count down to zero, then it follows that there is no problem counting down an infinite series. That objection clearly commits the fallacy of composition, which is saying that because a part of a thing has a property therefore the whole thing has the property. A classic example of this fallacy would be to think that because every part of an elephant is light in weight, therefore the whole elephant is light in weight. Similarly, in the series of negative numbers, every part of the series is only a finite distance from zero and so could be counted down, but it doesn't follow from that that therefore the whole series can be counted down. The question is not how any finite part of the series can be traversed or counted. The question is how the whole infinite series could be traversed or counted. That just isn't answered by this fallacious sort of objection.

Al-Ghazali sought to heighten the impossibility of forming an actually infinite past by successive addition by giving illustrations of the absurdities that would result if you could form an actually infinite past by adding one member after another. He says let's imagine our solar system. Let's imagine that for every one orbit that Saturn completes around the sun Jupiter (which is closer in) completes two. Notice that the longer they orbit, the further Saturn falls behind. If Jupiter has done ten trillion orbits, Saturn has only done five trillion. The longer they orbit, the further and further Saturn falls behind. If they continue to orbit forever, they will approach a limit at which Saturn is infinitely far behind Jupiter. Of course, they will never actually arrive at this limit but nevertheless they will approach this limit the longer they orbit.

Now, says Ghazali, turn the story around. Suppose they have been orbiting the sun from eternity past. Now which one has completed the most orbits? The answer, mathematically, is that the number of orbits completed is exactly the same: they have both completed an infinite number of orbits! Notice you can't get out of this argument by saying that infinity is not a number. Because it is a number in this case. We are dealing with an actually infinite number of orbits. So it is a number. In mathematics, \aleph_0 is a number— it is the number of elements in the set of natural numbers $\{0, 1, 2, 3, \dots\}$. So if they have been orbiting from eternity past at the rate of two orbits of Jupiter to every orbit of Saturn, they have now both completed the same number of orbits. But that seems absurd because the longer they orbit, the more the disparity between them grows. So how does the number of orbits magically become equal just by having them orbit from eternity past?

Here is one more juicy tidbit about this illustration. Ghazali asks: is the number of orbits completed odd or even? You know what the answer is, mathematically? It is both! It is both odd and even. An even number is $2n$. But $2 \aleph_0$ is \aleph_0 . So \aleph_0 is even. An odd number is $2n+1$. But $\aleph_0 + 1 = \aleph_0$. So \aleph_0 is odd. So the number of orbits completed is both odd and even. That, again, I think, just shows the absurdity of trying to form an actually infinite number of things by successive addition.

Here is another illustration. Suppose we meet a man who claims to have been counting down from eternity past and is now finishing: . . . -3, -2, -1, 0! Whew! At last! Why, we may ask, is he just now finishing his countdown, today? Why didn't he finish it yesterday, or the day before that, or the year before that? After all, by then an infinite amount of time had already elapsed. So if the man were counting, say, at the rate of one number per second, he's already had an infinite number of seconds to finish his countdown. He should already be done! In fact, at any point in the infinite past you pick, the man will already be finished with his countdown, which implies that no matter how far back in time you go, you will never find the man counting. That contradicts the hypothesis that he has been counting from eternity. This, again, I think shows the absurdity of trying to form an actually infinite by adding one member after another.

It is always encouraging when one's philosophical colleagues express support for an argument, and you manage to make some impact upon the territory. Therefore, I have been tremendously encouraged that two very brilliant and gifted philosophers Alexander Pruss of Baylor University and Rob Koons of

University of Texas at Austin have both defended a very engaging contemporary version of Ghazali's argument. This is called the Grim Reaper Paradox.

Imagine there are infinitely many grim reapers who are bent on your destruction. We can identify these as gods, so as to forestall any physical objections. Suppose you are alive at midnight, and that grim reaper #1 will strike you dead at 1:00am if you are still alive at that time. But grim reaper #2 will strike you dead at 12:30am if you are still alive at that time. But grim repeater #3 will strike you dead at 12:15am, and so on and so on. Such a situation seems clearly conceivable given the possibility of an actually infinite number of things. But it leads to an impossibility. You cannot survive past midnight, but you cannot be killed by any grim reaper at any time because you would already be dead! Pruss and Koons show how to reformulate this paradox so that the grim reapers are spread out over infinite time rather than over a single hour. For example, you can stipulate that each grim reaper will swing his scythe on January 1 of each past year if you have managed to live that long. You will get the same sort of paradox – you cannot survive to the present, and yet you cannot be killed by any grim reaper at any time. This shows, again, the impossibility of an actually infinite past.

Let me just conclude by saying that these illustrations, I think, go to strengthen al-Ghazali's claim that no series which is formed by adding one member at a time can be actually infinite.