
Craig is using Hilbert's hotel as a flawed intuition pump.

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William Lane Craig's *Kalam cosmological argument* is an attempted proof of the existence of God which relies on the idea that an actual infinity cannot exist to show that the universe had a start, and therefore requires a creator. As part of the argument intended to show that an actual infinity cannot exist, Craig uses *Hilbert's paradox of the Grand Hotel*, a scenario involving a hotel with an infinity of rooms, all of which are occupied. Various situations are described, which are counter-intuitive to many people. Craig uses all this to try to show that an actual infinity leads to absurdities, and therefore that an actual infinity could never really exist. It is shown that Craig is using Hilbert's hotel as a flawed intuition pump. This is done by means of a different version of the scenario that has the main features of Hilbert's hotel, but which does not import intuition relating specifically to hotels into the situation. It is also shown that relativity means that even if the problem claimed to exist by Craig were real, whether it existed or not would depend on an observer's point of view, which should make us skeptical of the idea that there is any problem.

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One of the supposedly absurd situations with the hotel is as follows.

The hotel is full. A guest arrives and wants a room. The manager asks the occupant of Room 1 to move to Room 2, the occupant of Room 2 to move to Room 3, the occupant of Room 3 to move to Room 4, and so on... so the occupant of any room, N , is asked to move to Room $N+1$. This leaves Room 1 vacant, and the new guest can be accommodated in it. But hang on: The hotel was full! From where did the extra room come? This is absurd, says Craig, and it shows that actual infinities cannot exist.

Normally, you might expect many pages of argument from me attempting to take this apart, but I will be dealing with things a bit differently this time. Craig is using Hilbert's hotel as a very bad intuition pump, and I am going to approach this from an *intuitive* perspective.

We can construct an alternative scenario which is essentially the same, as follows.

You are standing in an endless desert by the side of a road. The road stretches both ahead of and behind you without limit: The road is endless in both directions. A steady stream of cars is driving along the road. The cars are appearing from behind you, driving past you, and driving off into the distance in front of you. Each car is ten metres from the car in front of it. Every car has a car in front of it and a car behind it, and the stream of cars goes on endlessly in both directions. All the cars are moving at 20mph.

Now, does that seem disturbing? I suggest it is *not* as disturbing as Hilbert's hotel. It is just an endless road with cars driving endlessly down it. It does not have the same "getting something for nothing" aspect that the hotel seems to have. Our intuition about hotels should not be getting activated here.

Now, imagine the section of road in front of you. That section of road is "full", in that all of that section of road is occupied by the continuous line of cars, going at 20mph, 10 metres apart: Every "slot" in the road that can hold a car has one in it. However, cars are continually driving from the section of road behind you onto the section of road in front of you. This could never happen if the cars in front of you were stopped: There would be a pile-up. It is only possible for a car to drive onto the section of road in front of you because the traffic is moving: All the other cars are continually moving out of the

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way to make room. When a car passes you, it moves along and a space is available for the car behind it, and so on – and this applies all the way along the line of cars. Are many people going to say, “Where do you get the extra road from when the road is full?” I think fewer people are going to say that than would object about the hotel, because you can *see* what is happening here. It is just cars moving and the concept of “full” is not really relevant.

This scenario is essentially the same as Hilbert's hotel, except that without the hotel rooms, guests, asking guests to move, alleged magical creation of rooms and other add-ons, it should not appear remotely as strange. Craig's use of Hilbert's hotel is nothing more than a flawed intuition pump, which relies on people's intuition about how a hotel should work, and the limitations on hotels, and the issues with them becoming full, to get an unjustified idea accepted by feeding our intuition about hotels into an issue about reality in general.

Advocates of Craig's argument would, of course, just say that the problem that they claim that Hilbert's hotel shows us is still there with the cars: that “slots” for cars are being created from nowhere on a full road. I maintain that there is no such problem: that the intuition wrongfully pumped into the situation using the hotel should be gone now. Furthermore, if we are to say that a “slot” for a car is magically created, in defiance of reason, every time a car passes you, what is so important about passing you? You are just standing at an arbitrary point along the road. Nevertheless, to weaken this objection, I will now present a modified version of the scenario.

Imagine the scenario with the line of cars, but now moved out into space: The cars are spaceships. You are floating alongside a line of spaceships that extends endlessly in front of you and behind you. The spaceships are all moving at 20 mph, relative to you, and are 10 metres apart, just as the cars were. As with the cars, the spaceships behind you are moving towards you, and eventually passing you, and the ones in front of you are disappearing into the distance.

As before, we have the similarity with Hilbert's hotel, and of course an advocate of Craig's argument would claim this is just as bad, and that each time a spaceship passes us a “slot” comes from nowhere. There is, however, a way we can easily remove any such problem (not that I admit there is one): Just start to move forward at the same speed as the spaceships. Suppose you are wearing some kind of personal propulsion device: something like NASA's manned manoeuvring unit (MMU). You use it to accelerate yourself, increasing your speed by 20mph in the direction in which the spaceships are moving, so that you are all moving at the same speed. Of course, speed is relative, so all that matters now is that, from your perspective, the spaceships are all stationary alongside you. Any issues caused by the movement of the spaceships are now gone: It makes no sense to talk of “slots” for spaceships being magically created as they pass you, because they are not passing you anymore. How is it that a problem that was supposed to exist when the spaceships were passing you at 20mph has ceased to exist

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merely by accelerating yourself a bit so that your point of view changes? It will be obvious now, to some people at least, that the problem can disappear when your point of view changes because *there never was a problem*. The whole issue was just one of intuition being wrongly directed by Craig.

Bibliography

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