Did God Cause the Universe to Begin to Exist?

*An Extensive Refutation of William Lane Craig's Case for The Kalam Cosmological Argument.*

Younes Terrab

Master Thesis in Philosophy

Supervisor: Thomas Kjeller Johansen

University of Oslo

IFIKK

Spring 2019
Acknowledgements.

I would like to begin by thanking my supervisor Thomas Kjeller Johansen for his beneficial advice, guidance and feedback, which helped me in writing this thesis. I would also like to thank Øystein Linnebo for taking time off his busy schedule in order to read part of the fourth chapter of my thesis and for providing me with useful feedback. Lastly, I would like to thank Sean Carroll, who responded to several of my questions through email; his replies helped me in writing the fourth and fifth section of the fourth chapter.
Abstract

William Lane Craig takes a good argument to be a valid argument whose premises are more plausible than their negations. Craig claims that there are several valid arguments for God's existence that meet this criterion, and he takes the best amongst them to be The Kalam Cosmological Argument (KCA). Craig presents KCA as a valid argument with three premises and two conclusions. The first conclusion is that the universe began to exist, and the second is that God exists. Craig's case for KCA is a set of twelve arguments that seek to show that the premises are either true or more plausible than their negations, four arguments for each premise. I aim to show that contrary to Craig's claim, KCA does not meet his criterion for being a good argument. I will do this by refuting each of the twelve arguments and by giving a case against each premise. My case against the first premise is that it's equiprobable with its negation, my case against the second premise is a set of three arguments for why the premise is less plausible than its negation and my case against the third premise is that it's false.
### Table of Contents

Introduction .......................................................................................................................... 6

Chapter 1: The Prelude ........................................................................................................ 9
  1.1 Craig’s standard for a good argument ................................................................. 9
  1.2 My approach ......................................................................................................... 10
  1.3 The A-theory of time ......................................................................................... 10

Chapter 2: The History of KCA ................................................................................................ 13

Chapter 3: The First premise .................................................................................................. 20
  3.1 The Empirical Argument ...................................................................................... 20
    3.1.1 A possible objection from Craig ................................................................. 24
  3.2 Edward’s argument for all-encompassing causality ........................................... 27
    3.2.1 Craig’s objection ....................................................................................... 28
  3.3 The argument from simple truths ......................................................................... 31
    3.3.1 First possible objection: What about synthetic a priori proposition? .... 35
    3.3.2 Second Possible objection: Intuition as a link between understanding and truth. .... 38
  3.4 The Kantian Argument ......................................................................................... 43
    3.4.1 A possible objection: Reasonable assumption? ........................................ 45
  3.5 The case against the first premise .......................................................................... 46

Chapter 4: The Second premise ............................................................................................. 47
  4.1 The First argument: Impossibility of the actual infinite ....................................... 47
    4.1.1 Craig’s case for the first premise: The Illustration Argument .................. 49
    4.1.2 The A-theory of time, Platonism and the second and third premise .......... 64
  4.2 Cognitive intuition and recognition-primed decision ....................................... 67
  4.3 The Second argument: Formed through addition .............................................. 69
    4.3.1 Craig’s first objection ............................................................................... 72
    4.3.2 Craig’s second objection ....................................................................... 81
  4.4 The Third argument: Argument from the Big Bang ........................................... 83
    4.4.1 Craig’s case for the second premise ...................................................... 84
  4.5 The Fourth argument: Argument from the second law of thermodynamics .... 97
    4.5.1 A possible objection from Craig: Inductive generalization ..................... 99
  4.6 The case against the second premise ................................................................... 99

Chapter 5: The Third premise ............................................................................................... 100
Introduction.

One of the most profound and important questions that we can ask is whether or not God exists. This question splits us into four groups those who answer it in the affirmative (theists) or negative (atheists), those who suspend judgement on the questions (agnostics) and those that regard the question as meaningless (ignostics). I found myself leaning towards the atheist's side during the beginning of my teenage years, and I was convinced of the position by the end of them. My conviction was largely thanks to a controversial movement that was prominent at the time that was referred to as the New Atheist movement. This movement was spearheaded by four authors of different professions, Richard Dawkins, Sam Harris, Daniel Dennett and Christopher Hitchens. Going by the name of The Four Horsemen these individuals argued for the primacy of science and reasoned against the existence of God on the grounds that science has failed to establish his existence\(^1\). The movement has largely been insignificant the last five years compared to their peak a decade ago, but it has gotten some attention lately due to the recently published book *The Four Horsemen*\(^2\). Steven Poole gives an account of the movement's history that is mostly negative in a review of the book published in The Guardian. One interesting criticism he levels against The Four Horsemen is that they were never sophisticated in their argumentation\(^3\). This criticism reminded me of a similar one given by the Christian philosopher William Lane Craig a decade ago. He claimed that no one amongst the New Atheists had seriously engaged the case for the existence of God and that they were, in fact, ignorant of how good the arguments for God are\(^4\). Craig is not someone unknown to The Four Horsemen; he debated Hitchens in 2009 and Harris in 2011. During the latter debate Harris referred to Craig as "the one Christian apologist who seems to have put the fear of God into many of my fellow atheists"\(^5\). Harris’ comment is explained by the fact that Craig has been publicly debating atheists for over 25 years and has been publishing books and papers on the case for theism since

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1979. Craig has been called Christian philosophy's boldest apostle and is one of the most cited authors in philosophy of religion, a field that no one amongst The Four Horsemen was specialised in which could explain why none of them had engaged the case for God in a sophisticated manner.

What I want to do here is what Craig stated the New Atheists failed to do, and that is to engage the case for God seriously. I will do so by taking on and refuting the argument that he considers to be the best one for God which I take to be The Kalam Cosmological Argument (KCA). Craig has never directly stated that he believes KCA to be the best argument for God, but I assume that he thinks it is because most of his published work on the existence of God is on it and it is the only God argument that he has published an entire book on. Moreover, when Craig was asked which of the God arguments he would pick if he could only pick one, he answered that he would pick KCA for it's his favourite argument. Now it's true that it does not mean he takes it to be the best argument just because it's his favourite, but since he chose to pick it I take that to be a good indication that he believes KCA is the best argument for God's existence.

KCA belongs to a family of arguments known as Cosmological arguments which are arguments that reason from some aspects or fact about the universe (hence the name cosmological) to the existence of God. The argument goes as follows, everything that begins to exist has a cause, the universe had a beginning, therefore the universe must have a cause. In premise and conclusion form it’s set up as:

1. Everything that begins to exist has a cause. (Premise 1)
2. The universe began to exist. (Premise 2)
3. Therefore, the universe has a cause. (Conclusion from premise 1 and 2)

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6 Ibid.
This is the standard version of the argument and is typical how Craig presents the argument. The argument does not establish that God exists, but Craig follows up the conclusion with a set of arguments for why the cause must be God. At other times Craig expands KCA with an additional premise and in this version God's existence is a second conclusion. This version is presented as:

1. Everything that begins to exist has a cause. (Premise 1)
2. The universe began to exist. (Premise 2)
3. If the universe has a cause for its existence, then that cause must be uncaused, beginningless, changeless, immaterial, atemporal, spaceless, enormously powerful and personal, or in other words, God. (Premise 3)
4. The universe has a cause. (Conclusion 1 from premise 1 and 2)
5. Therefore, God exists. (Conclusion 2 from conclusion 1 and premise 3)  

Dawkins is the only one amongst The Four Horsemen who has addressed KCA, but he has done so very briefly. He grants the two first premises but rejects the third one (of the expanded version) without dealing with any of the theistic arguments for it. Outside the circle of the New Atheists, we find a more serious engagement with KCA (and Craig's case for it) by academic philosophers like Adolf Grünbaum, John Leslie Mackie, Quentin Smith, Graham Oppy, Richard Sorabji, and Wes Morriston. Craig has addressed most of their criticism, and some of his rebuttals have remained unanswered.

My aim in what follows is to show that KCA is not a good argument for the existence of God. I will do so according to Craig's own standard of what a good argument is. For each

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3 Grünbaum has written several papers addressing such as Theological Misinterpretations of Current Physical Cosmology (1998).
5 Smith has written multiple papers on KCA several which appear in the book Theism, Atheism, and Big Bang Cosmology (1995).
6 Graham Oppy has addressed the argument in several papers and in his book Philosophical Perspectives on Infinity (2006).
8 Morriston has written several papers against KCA such as Must the Beginning of the Universe Have a Personal Cause? (2002), Craig on the Actual Infinite (2002), and Must Metaphysical Time Have a Beginning (2003).
premise, I will refute Craig's arguments and give my case against the premise. I'll give a more detailed account of my approach along with a presentation of Craig's standard and some comments on what assumption concerning time is required for the argument to work in the first chapter. The second chapter is an account of the history and development of KCA while the third, fourth and fifth chapter deal with the three premises of the expanded version of KCA.

It’s important to note that I don't just seek to repeat arguments against KCA and Craig's case for it that have already been given by critics. I also seek to contribute to the debate around KCA by presenting new arguments against it and against Craig’s arguments for it, and I seek to address some of Craig’s rebuttals that have remained unaddressed.

Chapter 1: The Prelude.

1.1 Craig’s standard for a good argument.

To be as charitable to Craig as I can I will evaluate KCA according to his standard of what a good argument is. For I neither seek to undermine the strength he believes the argument has by judging it with a standard that he would find too lax nor do I seek to evaluate it by a criterion that he would find too strict. According to Craig, a good argument is one that is valid and justifiably sound. Validity relates to the form of the argument. A valid argument is an argument whose conclusion follows necessarily from the premises such that it cannot be the case that the premises are true while the conclusion is false. If the premises of a valid argument are all true, then the argument is deemed to be sound. Craig points out that a sound argument whose soundness is completely unknown to us cannot be considered a good argument. We need to have a justification for thinking that the argument is sound meaning that we need good reasons for taking the premises of the argument to be true. Craig finds absolute certainty about the truth of the premises as a justification to be too strict for he believes that there is almost nothing that we are absolutely certain of. Craig instead posits a weaker justification condition which is that every
single premise in the argument must be more plausible than its negation (its denial) given the evidence\(^\text{19}\).

So, in sum an argument is good if it meets the following two conditions:

(1) The argument is valid. (2) Each premise is more plausible than its negation given the evidence.

The condition of interest here is (2) because I don't dispute the validity of KCA (or of the extended version). Instead, my position is that given the evidence none of the three premises is more plausible than its negation.

1.2 My approach.

We recall that Craig has two ways of presenting KCA. One as the standard version combined with a set of arguments for why the cause in the conclusion must be God. The second as an expanded version that concludes with God’s existence. It does not matter whether we choose to address Craig’s case as the standard version and then engage the other arguments or to deal with it as one argument. Personally, however, I prefer to address it as one argument because we then get to call KCA an argument for God which is what it is supposed to be according to Craig as opposed to just an argument for a cause for the universe. So, in the present paper, I will be dealing with the expanded version and will be referring to it simply as KCA from now on.

Craig seeks to justify the soundness of KCA by giving twelve arguments, four arguments for each premise; these arguments seek to show that the premises are either true or more plausible than their negations. I am going to refute each of these arguments, and I will give a case against each of the premises. My case against the first premise is that it’s equiprobable with its negation, my case against the second premise is that it’s less plausible than its negation and my case against the third premise is that it’s false.

1.3 The A-theory of time.

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The first premise of KCA is The Causal Principle (CP) which states that everything that begins to exist has a cause. This principle is of use to Craig only if there is such an occurrence as temporal becoming meaning that there are things that begin to exist. If there is no such occurrence, then there is nothing to apply the principle to. Moreover, the second premise would be false without temporal becomings since if nothing begins to exist, then it follows that the universe never began to exist. Whether there is such an occurrence as temporal becoming or not depends on whether one takes time to be dynamic (The A-theory of time) or static (The B-theory of time).

Under the A-theory of time, there is a real difference between the past, the present, and the future in terms of existence. The present is real, while the past and the future are not. The past is not real since it has passed and is gone whereas the future isn’t real since it has yet to come; all that exists is the present. A good way to understand this is by using the Aristotelian notion of potential and actual in an illustration and comparing that to time. Something is actual if it presently exists and is potential if it doesn’t but has the possibility to if some condition is met. Take a seed as an example. The seed is actually a seed and potentially a plant. If we were to plant the seed and let it grow into the plant, then we can say that the plant was actualised, it went from being potential to being actual since the condition for its actualisation was met (properly planting the seed). We can compare the plant and the seed with the future and the past under the A-theory of time. The future is potential the same way the plant is before we plant the seed; neither can be said to have a real existence. Once we have the plant, we can no longer say the seed exists though it once did and in the same way the past does not exist even though it once did. Lastly just as we said the plant was actualised, likewise the future under the A-theory is constantly actualised as time moves in a linear direction from the present to the future.

Under The B-theory of time there is no real difference in terms of existence between the past, the present, and the future, all three exist. The past hasn’t gone out of existence, and the future is not merely potential, both are as real as the present just as your neighbours to your right and your neighbours to your left are as real as you are (assuming you have neighbours). Under this view time doesn’t move in a linear direction from the present to the future, the flow of time which we experience is taken to be nothing but an illusion. Since all past events and all future events

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events are as real as the present that means that the moment of your birth and the moment of your death is as real as the moment you are reading this.

A good way to explain this view is by way of analogy. We can think of the B-theory of time in terms of a video-sharing website like YouTube in which we compare time to a specific video file on the YouTube server. The video file is a complete set of data which can be played as a video via the YouTube video player. The video player can only play one segment at the time and each segment correspondence to some piece of data in the video file. The video player in this example can be compared to us; we can only experience one segment of time which is the present. Now even though the video player can only play segment by segment that doesn't change the fact that the data of the entire video exists in its entirety on the server simultaneously as every segment is being played. Likewise, just because we can only experience one segment of time, the present, that doesn't change the fact that all moments of time (those of the past, the present and the future) exist. Or just like the piece of data corresponding to segment 3:12 isn’t any more real than the part that correspondence to 2:32 or 4:54 just because the video player is currently playing at 3:12 likewise the year 2019 isn’t any more real than the year 610 or the year 3000 just because we are presently experiencing 2019.

Now, just like all past events and future events are as real as the present moment under the B-theory, so are all objects in the past and all objects in the future. My existence is no more real than that of Plato, Aristotle and some future philosopher in the year 3000 CE. The consequence of this is that there are no temporal becomings taking place; nothing ever begins to exist as Craig puts it. This is because everything exists now so to speak since everything that is in the past, the present and the future finds a place in at least one segment of time and all segments of time are equally as real as the present moment. Craig points out that under the B-theory the universe would not have begun to exist even if it had a finite past, it would just have had a first event in its timeline, the event being first in the sense that there is no event that precedes it. This first event will not be the existential beginning of the universe just like the first inch on a yardstick is not the stick’s existential beginning. We wouldn't say that a yardstick comes into existence at cm 0 that is marked on the stick; likewise, we wouldn't say the universe began to exist at the first event in its timeline under the B-theory. Not only would the first

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premise of KCA be nullified under the B-theory of time as nothing would begin to exist, but the second premise would also be false. Thus, it should come as no surprise that Craig rejects the B-theory of time and instead believes in the A-theory of time.

Even though the A-theory is more in line with the commonsensical view of time than the B-theory is, the A-theory is still regarded as the more problematic of the two by contemporary philosophers. This is because the A-theory of time is taken to be incompatible with the well-established theory of special relativity while the B-theory of time is regarded as very compatible with it. This is why more contemporary philosophers accept the B-theory over the A-theory. One could, therefore, dismiss KCA from the get-go because it relies on the more problematic view of time. However, to make our case as strong as possible, we will work under the assumption that the A-theory is true and show that KCA does not only fail under the B-theory but also under the A-theory.

Chapter 2: The History of KCA.

A historical account will not only familiarise the reader with the history, development and modernisation of KCA, but it will also be of aid in our refutation of some of the arguments Craig gives. The reason for the latter point is that the account will introduce amongst other things the key assumptions (which Craig retains) that were made by the ancient and medieval developers of the two philosophical arguments that Craig uses in his case for the second premise. We will introduce these assumptions here and later show that while they might have seemed unproblematic to these thinkers, we can no longer regard them as such given the development in mathematics the last two centuries.

The name of KCA is tied to its historical development and so explaining it will be an appropriate starting point. The first part of the name is the Arabic word Kalam which

linguistically means speech but in Islamic terminology refers to natural theology, that is the kind of theology that deals with proving the existence of God through philosophical argumentation. The early Muslims disagreed on the permissibility of Kalam. The Mu'tazila sect (a non-Sunni sect of Islam) and the Ashariyya school (one of the schools of creedal thought in the Sunni sect which is the largest sect of Islam) regarded Kalam as permissible while the Athariyya school (another Sunni school of creedal thought) didn't. The Atharis saw Kalam as a Bidah (Arabic for innovation) since Prophet Muhammad (the founder of Islam) had not engaged in it and it was not prescribed in the Quran (considered as God's literal words by Muslims), and they considered any such innovations related to Islam as sinful. The Atharis stuck only to Quran and Ahadith (the sayings of Prophet Muhammad), and they found sufficient proof for the existence of God in those two sources, as a result of this, they became known as Ahlu Hadith (people of hadith). The Mutazilites and Asharites didn't agree with the Atharis' reasoning. Instead they found Kalam useful in justifying their belief in God. They became known as the Mutakallimun (those who engage in Kalam), and it was in their honour that Craig named the argument “The Kalam Cosmological argument”.

While the Mutakilumun and the Atharis differed when it came to Kalam, they stood united against another group of Muslims known as the Falasifa (the philosophers). The Falasifa were Arab and Persian philosophers who had inherited the philosophy of Aristotle, Plotinus, and Galen. One controversial position the Falasifa took from Aristotle was his view that the universe was past- eternal. The Mutakalimun and the Atharis found the Aristotelian

view to be a heresy that is in clear contradiction with the teachings of the Quran, and this made them declare the Falasifa as kuffar (apostates). Besides takfir (excommunication) the Mutakalimun also engaged with the Falasifa and attempted to refute their position philosophically.

The Mutakalimun did not start from scratch, rather they built upon two arguments that were developed by the Christian philosopher John Philoponus (490-570 CE) who had argued against the same Aristotelian position 400 years prior. The first of these arguments is a reductio ad absurdum (just reductio from now) which is an argument type that seeks to disprove (or prove) a proposition by showing that if the proposition holds (or does not hold), then absurdities result. The argument is simple; the universe cannot be past-eternal because if it were, then absurdities would arise.

Philoponus worked under two assumptions which is why he believed absurdities would arise. The first assumption is that an infinite can neither be added to nor multiplied. The second assumption relates to Aristotle's definition of the infinite, Aristotle dichotomised the infinite into potential infinite and actual infinite. Aristotle defined a potential infinite as a non-terminating process that is heading towards an infinite value that will never be reached, a potential infinite is finite at all times. As for the actual infinite Aristotle defined it as an infinite that exists in reality as a complete whole, unlike the potential, an actual infinite is, in fact, infinite in magnitude. Philoponus' second assumption was that only a potential infinite could exist, so an actual infinite is impossible. Philoponus had a good reason to make these assumptions for he was trying to refute Aristotle's position on the eternity of the universe and Aristotle himself had made these

two assumptions\textsuperscript{4041}. And so Philoponus was using Aristotle against Aristotle so to speak. The Mutakalimun accepted these assumptions when they took use of Philoponus’ \textit{reductio}\textsuperscript{424344}.

Philoponus argued that if the universe is past-eternal, then the number of past days is infinite in the actual sense since these days have already passed, and thus the process is complete. So, an actual infinite would exist which is absurd given the second assumption\textsuperscript{45}. He further argued that since days are continually passing by that would mean that the number of past days is constantly increasing, but this violates the first assumption since the number of past days is supposed to be infinite if the universe is past-eternal and can therefore not increase thus we get another absurdity\textsuperscript{46}. Philoponus’ reasoning can be presented as the following argument:

1. An actual infinite is impossible, and infinity cannot be added to. (Premise 1)
2. An infinite temporal regress of past days is an actual infinite which is constantly being added to. (Premise 2)
3. If the universe is beginningless, then an infinite temporal regress of past days exists. (Premise 3)
4. Therefore, an infinite temporal regress of past days cannot exist. (Conclusion 1 from premise 1 and 2).
5. Therefore, the universe began to exist. (Conclusion 2 from premise 3 and conclusion 1).

It is important to note that Philoponus and those who took this argument from him are making a third assumption here, which is that an infinite temporal regress of past days would exist if the universe is past-eternal. This assumption is presented as the third premise. Now, it might appear

\textsuperscript{43} Peter S. Groff and Oliver Leaman, \textit{Islamic Philosophy A-Z} (Edinburgh: Edinburgh Univ. Press, 2007), 54.
that this third assumption is unproblematic, but we will later see in Chapter 4 that this assumption renders this argument invalid. We will also show in that chapter that the two other assumptions are problematic.

The second argument the Mutakalimun took from Philoponus and slightly modified is one that reasons from a principle that goes back to Aristotle again\textsuperscript{47}, and it is the simple rule that an infinite can't be traversed or to put it more simply the rule that one cannot count to infinity\textsuperscript{48}. Philoponus argued that objects in the universe could only exist if what caused them took place, and the cause could only take place if its cause, in turn, took place and so on. Now if the universe is past-eternal, there would be an infinite regress of causes for any object that exists and that would mean that the objects that exist now could never have begun to exist which is absurd. For the cause of any presently existing object would never have occurred since for that cause to occur its cause, in turn, would have had to occur and this keeps going on \textit{ad infinitum} (to infinity) never hitting a stopping point in which a cause occurs because an infinite cannot be traversed\textsuperscript{49}.

This argument does have an obvious flaw that is easy to point out. Even if we grant that every object that exists now does have a cause why should we think that its cause, in turn, must have one or that the cause of its cause must have one if the universe is past-eternal? Couldn't some causes be uncaused? Philoponus reasoning was based on the chemistry of his days. Objects are composed of elements, there are four elements (fire, air, earth and water) and elements can only begin to exist by being caused by other elements\textsuperscript{50}. Given this, any cause in a chain of causation ending with an object that presently exists requires a cause. So, we have no reason to accept Philoponus' assumption regarding the causes since we today reject such chemistry.

This problem is however easy to deal with for all that one needs to do is to modify the argument slightly as the Mutakalimun did. They converted the infinite regress in the argument from causation to temporality\textsuperscript{51,52}. The new target of the argument becomes an infinite regress of past events instead of an infinite regress of causes. The modified argument goes like this: the

\textsuperscript{47} Ibid, 365.
\textsuperscript{50} Ibid, 366.
present moment could never be reached if the universe was past-eternal because before the present moment could have arrived the one before it had to pass and so on ad infinitum\textsuperscript{53} which is impossible since an infinite cannot be traversed. The Mutakalimun’s reasoning can be presented as the following argument:

1. If the universe is past-eternal, then the number of past events is infinite. (Premise 1)
2. I could only be in the present moment if the number of past events is finite. (Premise 2)
3. I am in the present moment. (Premise 3)
4. Therefore, the number of past events is finite (Conclusion 1 from premise 2 and 3)
5. Therefore, the universe is not past-eternal (Conclusion 2 from conclusion 1 and premise 1)

This argument rests on two assumptions (required for the second premise) that the Mutakalimun made. The first assumption which was pointed out by Averroes (one of the Falasifa) is that an event can only happen if the event that precedes it has occurred\textsuperscript{54}. The second assumption is that whatever has an end must have a beginning\textsuperscript{55}. This second assumption entails that there is always a start point that is infinitely distant from any end-point in any collection that is infinite and hence an infinite would have to be traversed in the case of a past-eternal universe. Both of these assumptions are related to Craig’s second argument for the second premise and we will address them in Chapter 4.

The Persian scholar Abdul Hamid Al Ghazali (1058-1111 CE) took use of Philoponus’ two arguments and combined their conclusion with The Causal Principle (CP) to form an argument for the existence of God. He presented the argument in a tract titled The Jerusalem Epistle with the following form:

1. Everything that begins to exist has a cause. (Premise 1)
2. The universe began to exist. (Premise 2)

\textsuperscript{53} Ibid.
\textsuperscript{54} Ibid, 381.
\textsuperscript{55} Ibid, 378.
3. Therefore, the universe has a cause for its existence. (From premise 1 and 2). \(^{56}\)

It is this cosmological argument that came to be known as “The Kalam Cosmological Argument”, and we already presented it above in the introduction as the standard version of the argument. Ghazali states that the first premise is true because it is necessary by reason, and he gives Philoponus’ two arguments (the second in its original form) for the second premise\(^ {57}\). Ghazali does not give an argument for why the cause must be God. Instead, he just assumes that if the universe has a cause that Cause must be God\(^ {58}\).

Clarifying Ghazali's assertion of “necessary by reason” will prove useful for our refutation of Craig’s case for the first premise. Ghazali distinguished between proving a proposition through what he called *nuzra* which translates to theoretical reasoning but which we can simply think of as proving something through argumentation and between proving a proposition by appealing to what he called *darurat aql* which translates to necessity of reason\(^ {59}\). If a proposition belongs to the *darurat aql* category, meaning that it is necessary by reason, then it is such that it is so reasonable and self-evident that it can be accepted to be true without the need for argumentation\(^ {60}\). Ghazali states that a condition needs to be met for one’s appeal to *darurat aql* to be justified. If there are reasonable people that disagree with the claim that a certain proposition belongs to the *darurat aql* category, then an explanation for why these reasonable people disagree becomes a condition that needs to be met first before one can make the appeal to *darurat aql*\(^ {61}\). Ghazali’s argued that if such a condition is not put in place, then anyone can claim *darurat aql* for any propositions and it just becomes an arbitrary assertion\(^ {62}\).

Skip to 900 years after Ghazali’s death, and we find KCA being given new life by Craig. He built upon the Mutakalimun's case for the second premise by adding two new scientific arguments. He further adds three more arguments to Ghazali’s case for the first premise, and he

\(^{57}\) Ibid, 99.
\(^{58}\) Ibid.
\(^{60}\) Ibid, 27.
\(^{61}\) Ibid, 17.
\(^{62}\) Ibid, 18.
gives four arguments for why the cause of the universe must be God. Let us start by looking at his case for the first premise.

Chapter 3: The First premise.

The first premise of KCA is CP and states that everything that begins to exist has a cause. According to Craig CP is an all-encompassing principle that applies to all of reality. So, unlike the laws of physics that only apply within the universe, CP applies to what is within the universe, to the universe itself and if there are objects that are outside the universe, then it applies to them as well. So, if the universe began to exist, then it must have a cause if CP is true.

As stated earlier Craig gives four arguments for why this premise is true or at least more plausible than its negation. Three of these arguments are found in his very first published book The Kalam Cosmological Argument that came out in 1979. These are the empirical argument, the argument from simple truths and the Kantian argument. The other argument is Jonathan Edwards' argument for all-encompassing causality and was first given by Craig in his reply to Mackie’s critique of KCA.

3.1 The Empirical Argument.

Craig argues that our everyday experiences constantly confirm CP and likewise CP is never falsified by our experiences. According to him everything we observe that begins to exist always has a cause, and we never observe anything beginning to exist uncaused. It does seem that Craig takes CP to be falsifiable by experience, for why else would he mention that it is never falsified? The fact that something has never been falsified by observation would only add to that thing’s plausibility if it is falsifiable. If not, such observations would be expected given

63 William Lane. Craig, On Guard: Defending Your Faith with Reason and Precision (Colorado Springs: David C. Cook, 2010), 77
that it is unfalsifiable and unfalsifiability itself neither implies nor suggests likelihood and is, therefore, no virtue to appeal to.

Now, this empirical argument is inductive, and so the question that we need to ask is whether it is cogent or not. But before looking into that question let us first clarify what the terms inductive and cogent mean. Inductive arguments are weaker than deductive arguments (arguments that are valid in form) because they don't assure the truth of the conclusion if the premises are true; instead, the premises just lend support to the conclusion. An inductive argument can be referred to as a strong argument if it is such that if the premises of the argument are true, then the conclusion is likely to be true, by likely I mean that the conclusion is more plausible given the truth of the premises than its negation. If the premises of a strong argument are true, then the argument is said to be cogent.

The empirical argument states that CP is constantly confirmed and never disconfirmed by observation, but we haven’t observed everything in existence, and it could be the case that there are things which begin to exist uncaused in a faraway galaxy that we could never observe. So, CP does not necessarily follow from the premise “we constantly observe that anything that begins to exist has a cause, and we never observe otherwise”. Therefore, the empirical argument is not deductive. Still at first sight it does seem that our observations offer some support to CP and we can, therefore, take the argument to be inductive.

The question to ask now is whether the empirical argument is cogent? It is if the following two propositions are true:

(1) Conclusions reached via inductive reasoning are more plausible than their negations. (2) It is actually the case that CP is constantly confirmed and never disconfirmed (and it’s taken to be falsifiable) by our observations.

(1) Has been challenged by David Hume on the grounds that there is no non-circular justification for inductive reasoning. Inductive reasoning is the type of reasoning that moves from a set of observations to general laws or unobserved assertions. Inferring that the sun will rise up tomorrow from the fact that it has always risen up in the past or that the next ball in the jar will be green from the fact that every ball that has been drawn so far has been green are
examples of inductive reasoning. If inductive reasoning fails to be a reliable way of inferring, then any inductive argument we come across will be weak (including the empirical argument).

Hume pointed out that the basis of inductive reasoning is The Uniformity Principle (UP) which states that the past will resemble the future. Hume further pointed out that we are neither justified in believing in UP on a priori grounds (justifications that are independent of experience) nor on a posteriori grounds (justifications that depend on experience). We are not justified a priori because according to Hume we only have a priori justification for propositions that cannot be conceived to be false and UP can be conceived of as being false (just imagine the sun not coming up or an object beginning to exist uncaused). We are not justified a posteriori because we cannot prove UP to be true without appealing to UP which is circular. For the only thing, we can point to for UP being true is that it has always been true in the past and will, therefore, remain true, but that will only offer us justification if UP was true to begin with. This dilemma presented by Hume became known as the problem of induction.

A couple of solutions have been proposed but I think all of these fail at solving the problem. I am of the view that the problem of induction is one of those problems in philosophy that have yet to be solved and suspect strongly that it will never be solved. However, I do take inductive reasoning to be indispensable for science and think therefore that it should be assumed to be reliable to a certain extent on pragmatic grounds. Therefore, I think Craig is justified in assuming (1) to be true.

(2) Has been disputed by Paul Davies and Smith who argue that we do observe things that begin to exist uncaused in Quantum Mechanics (QM). The argument they give is based on Heisenberg's uncertainty principle, which states that it is impossible to measure the value of two conjugate variables (properties of particles that are complimentary) such as position and momentum. As a result of this, the link between cause and effect seem to break at the atomic

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66 David Hume, A Treatise of Human Nature (FLOATING PRESS, 2009), PDF, 149.
68 David Hume, A Treatise of Human Nature (FLOATING PRESS, 2009), PDF, 149.
69 Ibid, 153.
72 Quentin Smith and William Lane Craig, Theism, Atheism, and Big Bang Cosmology (Oxford: Clarendon Press, 1995), 121.
level; particles behave in a manner that is unpredictable and viciously irregular, they go out of existence at one moment and come back the next seemingly uncaused.

Craig responds that this argument fails for two reasons. The first reason is that the argument at best shows that there are things that begin to exist without sufficient causal conditions, but it does not show that these things don’t have necessary causal conditions and therefore the argument does not prove that (2) is false. A necessary causal condition is a condition that must be met for a particular effect to occur and a sufficient causal condition is a condition that will produce the effect when met. Though a sufficient causal condition guarantees the effect, it is not necessary for its occurrence. Moreover, necessary causal conditions don’t guarantee the effect, but a number of individually necessary causal conditions can jointly be sufficient for an effect. Craig argues that these particles that come and go out of existence do so in a sea of fluctuating energy called the quantum vacuum. The energy converts into a particle and converts back almost immediately. This means that the quantum vacuum is a necessary causal condition for the particles. The second reason the argument fails according to Craig is that the argument conflates between causation and predictability in principle. Heisenberg’s principle shows that we are unable to predict precisely the behaviour of particles. This makes it such that particles seem to occur without causes, but it does not entail that it is the case for there could be causes which are in principle unobservable.

Is Craig’s response successful against the argument from Heisenberg’s principle? It’s not. Let us begin with the second reason Craig gave. It is true that an appearance of uncaused beginnings does not entail that the occurrences are uncaused, and so the argument fails to disprove CP. But that does not change the fact that we do observe these particles as if they begin to exist uncaused, which appears to be contradictory with (2). Craig could try to recuse (2) with the first reason he gave. He could qualify CP such that something beginning to exist without a sufficient cause would not be a violation of CP. The qualified CP would read as:

(CP*) “Everything that begins to exist has at least a necessary causal condition.”

73 Ibid, 143.
74 Ibid, 145.
Does this qualification rescue (2) from the argument? Unfortunately, not. The qualified principle is unfalsifiable by observation. This is because we can only observe things inside the universe and no occurrence could happen inside the universe that would falsify CP*. For even if we observe something that seemingly pops into existence uncaused, we will do so inside the universe. This makes it possible for someone to posit that the universe was a necessary causal condition for that occurrence and there appears to be no way to disprove him. Thus (2) would be false for the second conjunct (CP isn't ever disconfirmed (and it’s taken to be falsifiable) by our observations) is false for CP is unfalsifiable. So, the argument from Heisenberg's principle is successful in showing that the sole premise of Craig's empirical argument is false.

3.1.1 A possible objection from Craig.

Craig could object by saying that he does not need the second conjunct, so he could weaken the empirical argument by dropping the second conjunct from (2) which would give the following:

(2*) “It is actually the case that our observations constantly confirm CP.”

Does this modification make the empirical argument cogent? Unfortunately, it doesn't. (2*) is still false. For if we were to take our constant observations and generalise them into a principle, we would get the following:

(MCP) “Everything that begins to exist within the universe has a cause.”

This principle which I call The Modest Causal Principle (MCP) is neither CP nor does it make CP more plausible than its negation as Smith points out and thus our observation cannot be said to confirm CP constantly (they only confirm MCP). Smith only says that MCP does not increase the probability of CP, he does not go into details why75, but it is easy to show why.

75 Ibid, 123.
For us to accept the first premise (CP), it must be more plausible than its negation meaning that it must have a probability higher than 0.5. To give a comparison when we toss a coin, the probability of tails is 0.5, and the probability of heads is 0.5 which means that they are equiprobable. So, MCP must at least make CP more probable than a coinflip in order for the empirical argument to be successful. Now consider the following proposition:

(P) “Only that which begins to exist inside our universe has a cause.”

P entails that neither any universe (both ours and others if there are any others) nor anything outside our universe (if there is anything outside) that begins to exist is caused since it states that only that which begins to exist inside our universe is caused. If P is true then CP is false, and if CP is true, then P is false, the two are mutually exclusive. Now given MCP which is more probable CP or P? The answer is that both are equiprobable given MCP, hence both have a probability of 0.5.

If we have two propositions that are mutually exclusive and jointly exhaustive (one of them must be true), then we will select the proposition that is supported by the evidence. But, if we have no evidence for either of the two, then we can still assign probabilities to each by using The Principle of Insufficient Reason (PIR). PIR states that if we have several possibilities that are mutually exclusive and jointly exhaustive, then given no evidence, the probability of each is 1 divided by the number of the possibilities. Let us assume that MCP is true and let us consider the following proposition:

(P2) “Universes and everything that begins to exist outside our universe are caused.”

If P2 is true, then CP is true, and if P2 is false, then P is true. P2 and its negation cannot both be true because of the second law of logic known as the law of non-contradiction which states that contradictory propositions cannot both be true simultaneously. This shows that CP and P are mutually exclusive. Moreover, P2 must either be true or false because of the third law of logic known as the law of excluded middle which states that given any proposition, either it is true, or its negation is true. This shows that CP and P are jointly exhaustive. Now MCP is neither evidence for the affirmation nor the negation of P2 for it only informs us about that which takes
place inside our universe. So, MCP can neither be considered evidence for CP against P nor for P against CP which means that they are equiprobable (per PIR) provided there is no other evidence for either option. So, in conclusion, neither the original empirical argument nor the weakened one is cogent.

3.1.1.1 A possible objection from Craig to our reply.

An objection Craig could come up with is one relating to induction. There is a principle used in physics which states that physical laws established inductively for one domain of physical events should be applied to as many domains of physical events as possible provided that there is no evidence which suggests that these domains differ to such an extent that the law would not be applicable. Craig could argue that a modest version of CP is such a physical law and therefore it should be extended to other domains (to universes and whatever is outside our universe). So even if MCP considered alone does not make CP more plausible than its negation, it does so given this other principle that relates to induction.

There are three problems with this objection. The first one is that this would be an abuse of the principle for the principle relates only to physical laws and not metaphysical laws, while CP is a metaphysical law according to Craig. Secondly, since we are going by principles used in physics, we should also take other principles in physics into consideration. Physics and the other natural sciences operate under a principle called methodological naturalism which states that only physical laws (as opposed to metaphysical) operate in the universe. Expanding MCP to CP would be a move from the physical to the metaphysical which is a violation of methodological naturalism. Lastly, Craig runs into problems even if we ignore methodological naturalism and allow a metaphysical application of the principle. Craig believes in creatio ex nihilo (creation out of nothing), and he takes this belief to be essential to Christianity. This belief would turn out false if we allowed a metaphysical application of the principle for we

76 Ibid, 113.
constantly observe that everything that begins to exist has both a material and an efficient cause. The material cause is that out of which something came from, for example, the material cause of a bronze horse toy is bronze. Efficient cause just refers to what caused something, in the case of the toy horse it could be the toymaker. If we generalize our observations into an all-encompassing law, as a metaphysical application of the principle allows, we will get that everything that begins to exist has both a material and an efficient cause. This would mean that if the universe began, then it had to have a material cause. Thus, God could not have created it out of nothing, and *creatio ex nihilo* would be false. So, we have two reasons why this objection fails and one reason why Craig himself should not make it.

Craig has responded to Morriston who gave a similar yet different point to the third one we just gave. Morriston’s point was that *creatio ex nihilo* seems just as counter-intuitive as something that begins to exist uncaused\(^\text{79}\). Craig conceded the point but argued that a universe that begins to exist uncaused denies both material and efficient cause while *creatio ex nihilo* only denies a material cause and this makes *creatio ex nihilo* more plausible than an uncaused finite universe\(^\text{80}\). This reply does not really affect my last point, for even if *creation ex nihilo* is more plausible than a universe that begins to exist uncaused, it does not change the fact that it would violate our general inductive law. So, the universe must either be uncreated which makes the second premise of KCA fails, or it must have been created out of some pre-existing materials which makes *creatio ex nihilo* false (given our general inductive law).

3.2 Edward’s argument for all-encompassing causality.

Another argument Craig gives\(^\text{81,82}\) is Jonathan Edwards’ argument against the possibility of an uncaused beginning. Edwards argued that if one thing can begin to exist uncaused, then

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82 Kevin Harris and William Lane Craig, comment on "Why Think Whatever Begins to Exist Has a Cause?" Reasonable Faith, , accessed October 11, 2018, https://www.reasonablefaith.org/media/reasonable-faith-podcast/why-think-whatever-begins-to-exist-has-a-cause/.
anything and everything can. For it would not make sense that only one particular thing could violate CP while everything else can’t. The reason is that things don’t have any nature or essence before existing and thus there is nothing to appeal to in order to explain why only this one thing is exempt from CP. So, one cannot say its due to its nature for it has no nature that would allow it to begin to exist uncaused while the nature of everything else suppresses those things from beginning to exist uncaused. As we said things only have nature once they begin to exist, and if there are no causes prior to their existence, then nothing is all there is, and nothing can’t discriminate between things, allowing some to begin uncaused while disallowing others. For nothing by definition has no properties at all while the ability to discriminate is a property. So, if CP is not true and true of everything, then anything and everything can begin to exist uncaused. From this Edward argues that we should expect to see millions of different kinds of things, rocks, trees and even humans begin to exist uncaused. Since this is not the case, it follows that CP must be true. We can present Edwards’ argument as:

1. If CP is false, then we should expect to see millions of different kinds of things like rocks, trees and humans begin to exist uncaused. (Premise 1)
2. We don’t see millions of different kinds of things like rocks, trees and humans begin to exist uncaused. (Premise 2)
3. Therefore, CP is true. (Conclusion from premise 1 and 2)

The argument is valid, but its first premise is false, and thus the argument is unsound. It does not follow that we should expect to see all of these things begin to exist uncaused if CP is false for its modest version MCP could still be true. MCP does not entail CP, and as we recall from the previous section, it does not even add to CP’s plausibility. Thus, it can be the case that MCP is true while CP is false, and if MCP is true, then we should not expect to see millions of different kinds of things like rocks, trees and humans begin to exist uncaused.

3.2.1 Craig’s objection.

Craig replies to the objection we gave to Edwards’ argument by saying that if it is the case that CP can be false as an all-encompassing principle but true inside the universe, then it becomes inexplicable why only things inside the universe that begin to exist are caused but not the universe (or anything outside of it). We cannot appeal to the nature of things (or of the universe) to explain this for things don't have nature prior to existing. And nothingness can't discriminate because nothing has no properties. So, Craig asserts that CP must be true for if it isn't, then we are left with no explanation for why we don't see anything and everything come into existence uncaused.⁸⁴

Oppy has responded to this objection by arguing that the explanation for why it is possible that CP could only apply inside the universe is that the universe is governed by certain physical laws such as the First Law of Thermodynamics which can be summarised as saying that neither energy nor matter can be created or destroyed.⁸⁵ Such laws prevent anything from beginning to exist uncaused inside the universe. Craig replies that this argument fails because physical laws only govern that which is physical, and something is only physical once it actually exists. So, these laws would not constrain things before they exist while we are looking for an explanation for why a constrain that prevents things from beginning to exist uncaused only exists inside the universe.⁸⁶

The point Craig made against physical laws can be raised against CP as well. Physical laws can only govern things once they actually exist, but how can CP govern them before they exist when there is only nothing before they do? How can CP constrain nothing when being able to be constrained is a property while nothing has no properties whatsoever? So, if physical laws are inadequate as an explanation because they can only constrain what exists, then every other law (including CP) is. Thus, it remains inexplicable why anything and everything doesn't just begin to exist uncaused even with CP being true.

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But even if we ignore this last problem, Craig’s argument would still fail for its fallacious. To quote Craig directly (to avoid misrepresenting him) "something cannot come into existence uncaused because it then becomes inexplicable why just anything and everything does not come into existence uncaused". Here Craig commits the fallacy of *argumentum ad consequentiam* (appeal to consequence). Craig moves from a desirable consequence to the truth of CP which is erroneous for it does not follow that something is true because it has a desirable outcome. Just as it does not follow that God exists because evil people would not get away with their wrongdoings unpunished if he existed (for he would punish them in the afterlife), likewise it does not follow that CP is true just because we would have an explanation for why anything and everything doesn’t just pop into existence uncaused.

### 3.2.1.1 A possible objection from Craig to our reply.

Craig could possibly object by saying that he can turn his objection into an abductive argument such that it wouldn't be fallacious. He could argue that the best explanation for why anything and everything does not begin to exist uncaused is CP. He could reason that CP is better than MCP because MCP leaves things unexplained (why there is a constrain only inside the universe). He can then present this abductive argument as a reason for why CP is more plausible than its negation.

Besides deductive and inductive arguments there are also abductive arguments. An abductive argument is an inference to the best explanation; it is a move from a set of evidence or a situation to a conclusion by picking out the best explanation for the set or situation. If for example Chris and Mary both have sushi and they both wake up sick we can conclude that the sushi made them sick, that would be an example of abductive reasoning. Just like inductive arguments are invalid so are abductive arguments. It is not necessarily the case that the sushi made Chris and Mary sick, it could be that Chris got infected with influenza viruses and Mary is nauseous because her period is about to start. But since the sushi is a better explanation because it is simpler (require fewer assumptions), it can be deemed as a more justifiable conclusion. Explanations are deemed better according to theoretical virtues; these are virtues such as explanatory power, simplicity, and coherence with background beliefs and evidence.
Now the reliability of abductive reasoning is debated amongst philosophers, some criticize it, and others reject it all together like Bas van Fraassen. Van Fraassen has pointed out that it is impossible for humans to consider all plausible explanations for something, and it could be the case that the explanations we consider turn out to be the worst ones. Thus, abduction would lead us to the best explanation amongst a bad lot. So, it is not clear that CP would be more plausible than its negation in virtue of being the best explanation out of a group of explanations (one that consists of only CP and MCP in this case) that could be a bad lot. Moreover, it’s not obvious that CP is the best explanation. Even if we ignore the problem that CP can’t govern nothing, and grant Craig that CP does not leave anything unexplained while MCP does it still does not follow that it’s the best explanation. For explanatory power is not the only theoretical virtue; another one is coherence with background beliefs and evidence. Everything that we observe that begins to exist has both a material cause and an efficient cause. If we modify MCP to include material cause, then it would cohere better with our observations than CP for CP allows things to begin to exist without a material cause. Thus, it is doubtful that such an abductive argument would be successful given these two considerations.

3.3 The argument from simple truths.

The third argument we will look at is Craig's argument from simple truths. Craig argues that the first premise is entailed by a principle that is so obviously true that its denial is an impossibility. The principle is *ex nihilo nihil fit* which can be translated as "nothing comes from nothing." Now if nothing can come from nothing, then that means that something can't come from nothing and so if something begins to exist, then it must come from something else and that something else can be referred to as its cause. So, we can easily see that if it is true that nothing comes from nothing, then it follows that anything that begins to exist must have a cause for its existence. So why is a denial of this principle impossible? Craig answers that it is so

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because the principle is a truth that is so simple and self-evident that once you understand it you come to know that it is true, and it requires no external justification\textsuperscript{91}.

Craig goes on to assert that some simple truths not only don’t require any justification, but it is actually impossible to prove that they are true, and he gives truths of logic as an example. The two laws of logic we mentioned earlier (the law of non-contradiction and the law of excluded middle) are two of the three fundamental laws of logic and are examples of truths of logic. The first law of logic is the law of identity which states that every single thing is identical with itself. Craig points out that we know that these truths of logic are true, but that doesn’t change the fact that the laws of logic cannot be proven to be true\textsuperscript{92}. The reason why it is impossible to prove them is that to prove anything we must use logic for logic is what governs reasoning, and thus nothing can be proven or disproven without logic. Logic, however, is based on the very laws we seek to prove, and so it would be circular and thus fallacious to appeal to logic to prove the laws of logic.

Craig's description of simple truths is similar to Ghazali's description of the concept \textit{darurat aql} (necessity of reason) that we mentioned in Chapter 2. Ghazali explains that propositions that are necessary by reason are so self-evident that once you understand them, you cannot fail to believe in them and if a person rejects them, then such a person was unable to understand them\textsuperscript{93}. Besides similar descriptions, we also find that the source of the justification in believing in such propositions is the same for both Ghazali and Craig. For Ghazali, a person is justified in believing in such propositions if he understands them and therefore he simply explains the meaning of the words used in wording CP (which he took to be necessary by reason\textsuperscript{94,95}) instead of giving an argument for it\textsuperscript{96}. So, for Ghazali, the justification comes from

\begin{footnotesize}
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\item Kevin Harris and William Lane Craig, comment on "Why Think Whatever Begins to Exist Has a Cause?" Reasonable Faith, , accessed October 11, 2018, https://www.reasonablefaith.org/media/reasonable-faith-podcast/why-think-whatever-begins-to-exist-has-a-cause/.
\item Ibid.
\item Jacobus Erasmus, \textit{The Kalām Cosmological Argument: A Reassessment} (Cham: Springer International Publishing, 2018), 55.
\end{enumerate}
\end{footnotesize}
understanding. Craig explains that we come to know simple truths through understanding them. The standard definition of knowledge defines knowledge as justified true belief, so if we know something, then we believe it, it is true, and we are justified in believing that it is true. Thus, if we know these simple truths, then we have justification in believing that they are true, and we come to know them by understanding them. So just like Ghazali, Craig holds that the justification for these propositions comes from understanding. Now even though Craig's notion of simple truths is similar to Ghazali's *darurat aql* and both hold understanding to be the justification for these propositions, there is a difference between the position of Craig and that of Ghazali. As we recall Ghazali put a condition for when one could justifiably appeal to the claim that a proposition belongs to the *darurat aql* category. Craig rejects this condition. We will later use this condition against Craig.

Now if we are justified in believing in *ex nihilo nihil fit*, then we are justified in believing the first premise of KCA because it is entailed by *ex nihilo nihil fit*. Craig's reasoning can be outlined as the following argument:

1. The first premise of KCA is entailed by *ex nihilo nihil fit*. (Premise 1)
2. Simple truths are such that if you understand them, then you are justified in believing in them without the need of any evidence or argumentation. (Premise 2)
3. *Ex nihilo nihil fit* is a simple truth. (Premise 3)
4. Therefore, we are justified in believing that the first premise of KCA is true if we understand *ex nihilo nihil fit*. (Conclusion from premise 1, 2 and 3)

So, does this argument work? It is a valid argument, the first premise here is uncontroversial, and I am willing to accept the second premise (I will explain why shortly). The third premise is however false as we will see and so the argument is unsound.

Philip Stratton Lake has argued against Robert Audi's notion of self-evident propositions, and his argument shows that the third premise of Craig's simple truth argument is false. Audi explains self-evident propositions as propositions that one is justified in believing in if one

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understands them\(^98\), so self-evident propositions are identical to simple truths with respect to justification. Lake points out that this is problematic because understanding can only justify analytical propositions. This renders the third premise false since \textit{ex nihilo nihil fit} is synthetic as we will see shortly but first let us explain what is meant by analytic and synthetic. It is important to note that whether or not there is an analytic/synthetic distinction is disputed by contemporary philosophers\(^99\) and the distinction was rejected by the late W. V. O. Quine\(^100\). But I will not deal with that debate here. Instead, I'll work under the assumption that there is such a distinction since Craig\(^101\) and I both accept that there is.

Analytical propositions are propositions that are true by virtue of their meaning. An example of an analytical proposition is "All bachelors are unmarried men". This proposition is true because of the meaning of "bachelor" and "unmarried". A bachelor is by definition an unmarried man, and so the proposition is true by definition. All logical truths are true, and analytical propositions are convertible to logical truths via substitution of synonyms for synonyms. If we replace "bachelor" with "unmarried men," we get the proposition "All unmarried men are unmarried men," which is an instance of the law of identity. For this reason, all analytical propositions are true. Understanding is linked with meaning, and for analytical propositions, the meaning of the words is linked to truth, and thus for analytical propositions understanding is linked to truth. It is for this reason that I accept the second premise in Craig's argument from simple truths, for Analytical propositions fit the description of simple truths. We can see whether or not a proposition is analytic if we understand the words that it's composed of, and if it is analytic, then merely understanding the words will reveal that it is true. And since understanding reveals its truth that means understanding provides justification for such an analytical proposition and so if we understand it, then we are justified in believing in it.

Propositions that are not true by virtue of meaning are called synthetic propositions. Synthetic propositions are not logically necessary, unlike analytical propositions, meaning their denial doesn't lead to a contradiction of a logical truth, and hence, they can be false. Lake argues that since synthetic proposition can be true or false evidence is going to be required for their

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truth in order to believe in them justifiably. He points out that understanding by itself does not constitute such evidence for synthetic propositions since understanding tells us the meaning of the words, and the meaning of the words in a synthetic proposition is not evidence for its truth. For example, merely understanding all the words in “All milkmen love milk” does not tell us whether every milkman that exists in the world loves milk or not. So as Lake concludes, understanding does not provide justification for synthetic propositions, and so they cannot be self-evident (or simple truths in Craig’s case)\textsuperscript{102}. This is a problem for Craig because the principle of \textit{ex nihilo nihil fit} which can be phrased as "something cannot come from nothing" is a synthetic proposition. The meaning of "something" and the meaning of "nothing" tell us nothing about whether or not something can come from nothing. So, the third premise of the argument is false, making the argument unsound.

\textit{3.3.1 First possible objection: What about synthetic a priori proposition?}

 Somebody could object that we have only contrasted analytical propositions with synthetic a posteriori propositions. They could argue that we have taken analyticity to be equivalent with \textit{a priori} in our analysis when, in fact, there are non-analytical \textit{a priori} propositions. They could say that \textit{ex nihilo nihil fit} is a synthetic \textit{a priori} proposition and therefore it can be classified as a simple truth. Now some philosophers like A. J. Ayer rejected the possibility of synthetic \textit{a priori}\textsuperscript{103}, and some philosophers have taken \textit{a priori}, metaphysically necessity and analyticity to be equivalent\textsuperscript{104}. However, such positions are problematic, and an explanation of why will be of use in showing that Lake's point that only analytical propositions can be justified by understanding still stands.

A proposition is \textit{a posteriori} if its truth can only be discovered by investigating how the world is. Since we can only discover the world by means of our senses and experience, that means that such propositions are only knowable on the basis of sense observation or experience.

For this reason, *a posteriori* propositions are sometimes referred to as empirical propositions\(^{105}\). If a proposition's truth is discoverable without the need for such an investigation, for example, if its truth is discoverable simply by substituting synonyms or carrying out mathematical proof or logical inferences in our heads, then the proposition is said to be *a priori*. So *a priori* propositions are knowable independent of the senses and experience. Analytical propositions are *a priori* since their truth can be discovered via substitution of synonyms.

As for the notion of metaphysical necessity, it relates to possible worlds. The world we are in, the world in which Donald Trump is the president of the United States of America, in which Ottawa is the capital of Canada and in which the Allies won the Second World War is the actual world. A possible world is a way the world might have been like, for example, a world in which Hillary Clinton is the president of the United States of America or a world in which Toronto is the capital of Canada. Now, if something is true in a possible world, then its metaphysically possible. Metaphysically possible propositions are said to be contingent, for their truth (or falsehood) depends on what world we have in mind. If something is true in all possible worlds, then it is metaphysically necessary. Metaphysically necessary propositions' truth does not depend on what world we have in mind, for they are true in all of them and they are therefore non-contingent. If something isn’t true in any possible world, then it is metaphysically impossible.

From these definitions, Aaron Sloman points out the following\(^{106}\):

1. All *a priori* propositions are metaphysically necessary, but it's problematic to assert the converse. (2) All analytical propositions are *a priori*, but it's problematic to assert the converse. (3) All analytical propositions are metaphysically necessary, but it's problematic to assert the converse.

Let us begin by looking at (1). If the truth of a proposition can be discovered without observing or experiencing the world, then the truth of that proposition is not contingent on how the world is. So, it must be metaphysically necessary since its non-contingent and true. Thus, all *a priori* propositions are metaphysically necessary. It is problematic to say that the converse is true, that is that all metaphysically necessary propositions are *a priori*. For metaphysical necessity does

\(^{105}\) Ibid, 13.  
\(^{106}\) Ibid, 15-6.
not entail knowability. Nothing prevents a metaphysical proposition from being unknowable by us humans (thus neither *a priori* nor *a posteriori*). As for (2), we already showed above how analytical propositions are *a priori*. We cannot, however, assert that all *a priori* propositions are analytic. For it, does not follow that something is true by virtue of meaning from the fact that its truth is discoverable without the need of investigating how the world is. (3) follows from what has been said, since all analytical propositions are *a priori*, it follows that they are all metaphysically necessary and since not all metaphysically necessary propositions are *a priori*, it follows that they are not all analytical. It should be noted that Sloman's definitions are the traditional definitions and some philosophers like Saul Kripke have disputed these definitions; Kripke holds that there are propositions that are *a priori* and yet contingent. Kripke's position, however, is controversial\(^\text{107}\) and Craig accepts the traditional definitions\(^\text{108}\), so we can overlook this and go with the traditional definitions.

From this, we can see why the position of the Ayer is problematic, for synthetic *a priori* appears to be possible. Does this make it possible that synthetic propositions can be simple truths? No, for Lake's point still stands, namely that only analytical propositions can be simple truths. Now it's true that evidence is required for *a posteriori* propositions since they can be true or false and it's also true that understanding does not serve as such evidence. Moreover, it is also true that synthetic *a priori* propositions require no evidence for their truth since they can't be false, and it also true that synthetic *a priori* propositions are knowable independent of observations and experience. All of this however does not make synthetic *a priori* propositions simple truths. A metaphysically necessary proposition's truth being discoverable without the need to investigating the world does not entail that understanding by itself is sufficient for its justification. For understanding to be sufficient, it needs to be linked to truth; such a link exists for analytical propositions since they are true by virtue of meaning and thus meaning links truth and understanding. But as Lake pointed out, meaning does not provide such a link between truth and understanding in the case of synthetic propositions because they are not true by virtue of meaning. This is the case for both synthetic *a posteriori* and synthetic *a priori*, for if an *a priori* proposition meets the condition for being a simple truth such that a link exists between


understanding and its truth, then it is true by virtue of meaning and thus analytical. So, the third premise remains false.

3.3.2 Second Possible objection: Intuition as a link between understanding and truth.

Somebody could object to us by arguing that even though meaning does not link truth and understanding in the case of synthetic propositions, something else can. But what? Craig states that it is thanks to a metaphysical intuition\(^{109}\) that we come to know simple truths by understanding them; he could posit such an intuition as a link between understanding and truth. He could say that by understanding a simple truth proposition, an intuition gets activated in us, which, in turn, shows us that the proposition is true. Lake himself has suggested this approach as a way around the problem he pointed out regarding Audi’s self-evident propositions\(^{110}\).

Would knowing a proposition via such an intuition be a case of discovering the truth in a manner that is independent of sense observation and experience or a manner that is dependent on them? Craig has stated that it doesn’t matter whether CP is \textit{a priori} or \textit{a posteriori} for the intuition reveals it as true either way\(^{111}\). I assume he would say the same of \textit{ex nihilo nihil fit}, which is the principle he initially claimed was a metaphysical intuition. Now, this seems puzzling, for if the intuition tells us that the proposition is true and there is no need for any additional arguments, empirical evidence or anything else to justify our belief in it, then it appears we came to be justified independently of observation and experience.

This confusion is cleared up when we realize that Craig does not takes intuition in the case of \textit{a posteriori} to be an ability that directly reveals the propositions to be true but rather he takes intuition to be one that shows if the propositions are true, then they must be metaphysically necessary. Craig explains that it could be such that our intuition reveals that CP must be metaphysically necessary if it's true and this would make it such that our experience in the world

\(^{109}\) Kevin Harris and William Lane Craig, comment on "Why Think Whatever Begins to Exist Has a Cause?" Reasonable Faith, , accessed October 11, 2018, https://www.reasonablefaith.org/media/reasonable-faith-podcast/why-think-whatever-begins-to-exist-has-a-cause/.


that serves as evidence for its truth also serves as evidence for it being metaphysically necessary\textsuperscript{112}. This would make the third premise of the argument from simple truths false if \textit{ex nihilo nihil fit} \textit{is a posteriori} even if we have this intuition. This is because as Craig has explained elsewhere, simple truths are such that if you understand them, then you can see that they are true and in doing so you are justified in believing they are true without the need of any additional justification\textsuperscript{113}. But in the case of \textit{a posteriori}, we would need empirical evidence for justification in addition to our intuition, for we would need to have evidence from experience. If intuition is going to save the argument from simple truths, then we have to limit ourselves to synthetic \textit{a priori} propositions, and that is what we are going to do from now onwards.

The next question to ask is what is meant by "metaphysical intuition". Craig’s description of "metaphysical intuition" is ambiguous due to him describing it in conflicting ways. At times Craig differentiates the metaphysical intuition from our everyday intuition (the kind of intuition that psychologists’ study and are interested in). When a questioner asked Craig why he takes human intuitions to be some form of justification when history has shown that our intuition often misleads us, Craig replied by saying that the questioner confuses our everyday intuition with philosophical intuition. Craig then went on to explain that the metaphysical intuition is a philosophical notion that describes an ability we have that allows us to see clearly the truth of simple truths\textsuperscript{114}.

At other times Craig’s description of the metaphysical intuition makes it appear as if it is, in fact, the same kind of intuition as our everyday intuition, the kind of intuition that is studied and theorised about in the field of modern psychology, let’s call that the cognitive intuition. For example, Morriston critiqued Craig’s appeal to metaphysical intuition by pointing out that neither he nor others like Mackie found it intuitively true and self-evident that something cannot begin to exist uncaused. Morriston demanded an explanation from Craig for why such philosophers don't share his intuition\textsuperscript{115} to which Craig replied that such a request is odd since a philosopher is not obliged to give a psychological account of why other philosophers disagree

\textsuperscript{112} Quentin Smith and William Lane Craig, \textit{Theism, Atheism, and Big Bang Cosmology} (Oxford: Clarendon Press, 1995), 274.
\textsuperscript{113} Kevin Harris and William Lane Craig, comment on "Why Think Whatever Begins to Exist Has a Cause?" Reasonable Faith, accessed October 11, 2018, https://www.reasonablefaith.org/media/reasonable-faith-podcast/why-think-whatever-begins-to-exist-has-a-cause/.
\textsuperscript{114} Ibid.
with him. This reply makes it seem like Craig is not talking about the philosophical notion he described above but of the everyday intuition that is studied by psychologists and of which you can give a psychological account. Thus, it is not clear whether Craig is talking about a philosophical intuition or the cognitive intuition. Due to this ambiguity, I will address both and show that neither of them rescues the argument from simple truths. Let us begin with the cognitive intuition.

As we mentioned above Lake believed that intuition could make it such that synthetic propositions can be considered as self-evident propositions (or simple truths in Craig's case) if it linked understanding to truth. He explains that the way the linkage would work is that understanding would be a necessary condition for intuition, such that you could not see that a synthetic proposition is intuitively true until you first understand it. Lake further explains that the justification provided by intuition is adequate for justifying belief in the proposition but that this justification is defeasible, meaning it is viable for negation. One way it can be negated according to him is if an explanation can be given for why the proposition appears to be so intuitively true. Now if Craig takes the intuition to be our everyday intuition, the cognitive intuition, then we can appeal to recent research in psychology to explain why our intuition might make \textit{ex nihilo nihil fit} and CP appear to be true. I will not present the case here because Craig also appeals to intuition in his first argument for the second premise and I rather present a more detailed case from psychology after I presented all his appeals to intuition and so the case will be given in 4.2.

If Craig holds that the metaphysical intuition is different from the cognitive intuition, then he can dismiss whatever we bring from psychological research as irrelevant. He can point out that such data concerns our everyday intuition rather than our philosophical one. So, is there any reason to think that we have such a philosophical intuition that makes \textit{ex nihilo nihil fit} appear clearly and evidently true? Answering this question is difficult for three reasons, and this makes it problematic for Craig.

The first reason is that there is disagreement over which propositions are synthetic \textit{a priori}. Some synthetic propositions appear to be undeniable to anyone who understands them; this does not only include the philosophically trained but also laypeople and children. An

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example of such a synthetic proposition is "an object can't be red and green all over at the same time." While other synthetic propositions are debated, for example, moral intuitionists claim that moral propositions such as "pain is bad" are synthetic a priori, but error theorists (those who take all moral propositions to be false) rejects them as such. The second reason is that there is disagreement on how to recognize whether a synthetic proposition is a priori or not. Mackie, Morriston and Smith hold the view that a proposition is not a priori if we can imagine it being false, while Craig rejects this. The third reason is because of human psychology. If someone understands a synthetic proposition, and it appears to him that it is a priori true, then it would be difficult to know whether this is so because he might have a philosophical intuition or because he might suffer from a psychological bias that makes it impossible for him to conceive of the possibility that the proposition could be false.

Let's apply these points to ex nihilo nihil fit. It is disputed whether or not the proposition is a priori and intuitively evident. For example, Mackie does not find the principle to be a priori, Morriston states that it does not have the kind of obviousness that characterizes synthetic a priori propositions such as "an object can't be red and green all over at the same time", and Oppy does not find the possibility of something beginning to exist uncaused to be unreasonable. Furthermore, Craig rejects the method of testing whether or not a synthetic proposition is a priori by trying to imagine its negation. So, we have no method for testing whether or not ex nihilo nihil fit is a priori.

Now, we recall understanding was a necessary condition for the intuition to be activated and I don't doubt that Mackie, Morriston and Oppy have understood ex nihilo nihil fit considering the fact that they have published works in which they discussed it in depth.

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122 Ibid, 275.
Moreover, Craig has stated repeatedly that it is impossible for a sincere person to deny *ex nihilo nihil fit*, and as we recall, he described simple truths as those propositions whose truth becomes evident once understood. Thus, understanding for Craig is not only necessary for the intuition, but it is also sufficient.

Taking all of this into consideration, it seems we have four possibilities:

1. Is that Oppy, Morriston or Mackie are insincere in their claim that *ex nihilo nihil fit* is not intuitively true.
2. Is that Craig is insincere in his claim that *ex nihilo nihil fit* is intuitively true.
3. Is that Craig perceives the principle as intuitively true after he understands it even though it's not synthetic a priori and the cause for that is a psychological bias.
4. Is that there is no philosophical intuition.

At this point Ghazali becomes helpful. We recall that Ghazali put a condition which was that in the case of a disagreement regarding a proposition, one could only claim that it is necessitated by reason if one can explain why reasonable people disagree that it is. Without this condition, the appeal would be arbitrary; anyone could claim anything is necessary by reason (or a simple truth is Craig's case). We can apply this condition here and ask Craig for an explanation or justification for why we should accept (1) instead of either (2), (3) or (4). Without such an explanation, Craig's claim that *ex nihilo nihil fit* is a simple truth cannot be considered anything other than an arbitrary assertion.

It is important to note that I neither doubt the sincerity of Craig nor do I doubt the sincerity of Mackie, Oppy and Morriston. I have the utmost respect for all of these four philosophers. I am just drawing out the logical conclusion of Craig's assertions. I left out the possibility that Mackie, Oppy and Morriston could have failed to perceive the principle as a priori true due to a psychological bias because Craig takes understanding to be a necessary and

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sufficient condition. So, a psychological bias or block could prevent them from understanding the principle (we assumed they did understand it), but not from seeing it as \textit{a priori} true once they understood it.

\textbf{3.3.2.1 Possible reply from Craig’s.}

Craig could object to us the same way he objected to Morriston when Morriston requested an explanation for why reasonable philosophers don't share his intuition, and that objection was that a philosopher is not obliged to give a psychological account of why other philosophers disagree with him. This reply would be problematic for a couple of reasons. If Craig feels that he has no obligation in explaining why other reasonable people don't share his intuition, then why should we be obliged to accept his intuition that we don't share? Why shouldn't we just dismiss his claim that \textit{ex nihilo nihil fit} is intuitively true on the ground that it's a baseless and arbitrary assertion or an assertion based on delusion or a psychological bias? There appears to be no reason why we shouldn't, especially since he rejects Ghazali’s condition. Moreover, his reply is not relevant if he takes the metaphysical intuition to be a philosophical intuition. For, in that case, Craig is not merely making an assertion about his own psychology or that of others. Craig is making a philosophical assertion, namely that there is a philosophical intuition that is different than the cognitive intuition and that understanding is a sufficient condition for this philosophical intuition such that it is impossible for anyone who understands \textit{ex nihilo nihil fit} to doubt it sincerely. So, Craig does have an obligation of justifying these assertions if he wants to justifiably claim that \textit{ex nihilo nihil fit} is a simple truth. Furthermore, if Craig takes the metaphysical intuition to be the same as the cognitive intuition, then we don't even have appeal to Ghazali's condition. Instead, we can show that even if \textit{ex nihilo nihil fit} appeared to be intuitively true, then that would still not justify \textit{ex nihilo nihil fit} because we can explain why it appears to be intuitively true using recent research in psychology, more on this below (4.2).

\textbf{3.4 The Kantian Argument.}
The fourth argument for the first premise that Craig has given is a transcendental argument for CP. Transcendental arguments attempt to show that some propositions must be true because they are necessary conditions for other propositions that are taken to be true. Since the latter propositions are taken to be true, that means that their necessary conditions were met and thus the former propositions must be true as well. At this point, a transcendental argument might just sound like an argument in modus ponens form meaning that one premise of the argument is a material conditional proposition (if-then proposition) and the second premise is its antecedent (the subproposition that comes after if). Material conditional propositions are false if the antecedent is true but the consequent (the subproposition that comes after then) is false, so if a material conditional proposition is true, then the consequent in it is a necessary condition for the antecedent in it. However, this type of necessary condition is logical necessity while the type of necessity transcendental arguments rely on is not logical necessity but metaphysical necessity. So, it is not logically impossible for a proposition to be true while its metaphysical necessary condition is not met, but it is metaphysically impossible meaning that this cannot occur in any possible world. The propositions that are supposed to be taken to be true in transcendental arguments usually relate to our mental aspects, typically about the possibility of having experience, thought, and knowledge. It is for this reason that they are called transcendental, the word denotes knowledge about the preconditions of experience.

Transcendental arguments are associated with Kant because his transcendental argument is taken to be a paradigm of such arguments, and it is this argument that Craig gives for CP. The argument tries to establish that CP is synthetic a priori. Craig presents the argument as follows: (1) To have knowledge about the world intelligible experience is required, and for the mind to make experience intelligible, it must operate according to a set of principles referred to as the categories of the mind. (2) These categories must either be a priori or they must have been derived from experience. (3) They could not have been derived from experience since, in order to derive anything from experience, the experience needs to be intelligible, and the categories are a precondition for intelligibility. (4) Since we do have knowledge and intelligible experience, it

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must be the case that the categories are *a priori* true. (5) CP is one of the categories and it’s synthetic, so it must be the case that CP is synthetic *a priori*.132

Craig clarifies that CP is not a necessary condition for all types of experience, for example, it is not a necessary condition for experience sensations such as those that animals have, rather it is a necessary condition for intelligible experience, the type of experience required to gain knowledge about the world.133 So, is this argument successful? Not at all. For it does not follow that CP is true of the world, from the fact that our minds could only make experience intelligible if they operated under CP. CP can be false even though we need to assume that it is true for us to make our experiences intelligible. The most we can grant to Craig is that believing that CP is true is a necessary condition for intelligible experience, but this would only establish a psychological fact about us, it would not establish the desired ontological claim that everything that begins to exist has a cause. Barry Stroud points out that in order for the argument to be successful we must assume that it is only possible for experience to be intelligible if it is impossible for the belief that makes experience intelligible to be false.134 Craig would have to provide an argument for why we should accept such an assumption. Moreover, as Smith points out, the argument fails to establish that CP is synthetic *a priori*. The reason is that synthetic *a priori* propositions are metaphysically necessary, but there are possible worlds with no minds, such worlds would not have any intelligible experience, and there is nothing that would prevent CP from being false in such worlds even if CP was a necessary condition for intelligible experience.135

### 3.4.1 A possible objection: Reasonable assumption?

Somebody could reply that the argument at least establishes that CP is a necessary condition for intelligibility and that makes it reasonable to assume that CP is true. They could compare such an assumption with the one we granted above regarding inductive reasoning,
which was that it is reasonable to assume that inductive reasoning is reliable because such reasoning is indispensable for science. This argument would, however, fail since CP is not indispensable (or necessary) for intelligibility since the modest version of it that we presented above, that everything that begins to exist inside the universe has a cause, makes our experience just as intelligible as CP does.

Moreover, it should also be noted as Smith pointed out, that Craig has modified Kant's argument slightly, Kant did not take CP to be one of the categories of the mind. Instead, he took the causal category of the mind to be that every change in a thing requires a cause. This causal category is compatible with the universe beginning to exist uncaused. For the universe is only a thing after it exists, so it’s impossible for change to happen in the universe as a thing prior to it existing, and thus if it began to exist uncaused then Kant's causal category would not have been violated.

So, if anyone wants to claim, that the transcendental argument makes CP a reasonable assumption, then he has to tell us why neither belief in the modest version of CP nor belief in Kant's causal category is sufficient for making experience intelligible. If no such explanation can be given, then we are justified in rejecting the claim that believing that CP is true is a necessary condition for intelligible experience.

### 3.5 The case against the first premise.

So, what is my case against the first premise? We recall that two possibilities that are mutually exclusive and jointly exhaustive are equiprobable according to the principle of insufficient reason if there is no evidence for either possibility. All of Craig's arguments for the first premise of KCA failed to provide the premise with the support needed to make it more probable than its negation, and I can't provide any argument that supports its negation. So, as things stand the premise and its negation are equiprobable which means that KCA fails to meet condition (2) of Craig’s good argument standard which was that each premise of the argument must be more plausible than its negation and so KCA comes out as a bad argument.

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136 Ibid, 186.
Chapter 4: The Second premise

It is enough to reject KCA as a bad argument by simply pointing out that the first premise is equiprobable with its negation. But the argument will come out as even worse if the same can be said about the second premise and it will come out as even worse than that if the second premise can be proven to be less plausible than its negation. In this chapter, I will present three arguments for why the second premise is less plausible than its negation. These arguments will be given in 4.3.1, 4.4.1, and 4.4.1.1. But before that, I will address Craig’s two first arguments for the second premise and take a look at cognitive intuition.

Craig refers to the second premise as the key premise\textsuperscript{137} of the standard version of KCA. He seeks to defend the premise through both philosophy and science; he presents two philosophical arguments in defence of the premise and two scientific arguments. All four of the arguments can be found The Kalam Cosmological Argument (1979). The first philosophical argument is against the possibility of an actual infinite, and the second is against a formation of an actual infinite through successive addition. The first scientific argument seeks to prove the beginning of the universe from its expansion while the second seeks to prove its beginning from the second law of thermodynamics.

4.1 The First argument: Impossibility of the actual infinite

The first philosophical argument Craig gives is Philoponus’ \textit{reductio} that we presented in Chapter 2. Craig argues that the universe must have had a beginning in time for if it didn’t, then an actual infinite number of past events would exist but that is impossible according to Craig for an actual infinite cannot exist in reality. It is important to note that Craig does not have a problem with the notion of an actual infinite itself, Craig agrees that the concept is logically coherent and that it is an important idea in the field of mathematics especially in set theory. Craig’s only contention is against an instantiation of an actual infinite in reality; he does not

believe it can exist in the physical world, the world in which we humans exist\textsuperscript{138}. Craig formulates the argument as:

1. An actual infinite cannot exist. (Premise 1)
2. An infinite temporal regress of events is an actual infinite. (Premise 2)
3. Therefore, an infinite temporal regress of events cannot exist. (Conclusion from premise 1 and 2)\textsuperscript{139}.

Craig's formulation here is problematic. We recall from Chapter 2 that the third assumption that Philoponus' made was that an infinite temporal regress of past days would exist if the universe is past-eternal. Without this assumption, Craig's argument could be sound and yet unproblematic for the possibility of a beginningless (past-eternal) universe. The argument would only be problematic if the existence of an infinite temporal regress of events were entailed by a beginningless universe. Thus, we have to reformulate the argument and present it as:

1. An actual infinite is impossible. (Premise 1)
2. An infinite temporal regress of events is an actual infinite. (Premise 2)
3. If the universe is beginningless, then an infinite temporal regress of events exists. (Premise 3)
4. Therefore, an infinite temporal regress of events cannot exist. (Conclusion 1 from premise 1 and 2).
5. Therefore, the universe began to exist. (Conclusion 2 from premise 3 and conclusion 1).

This argument appears to be valid, but as it turns out, it’s not given an anti-Platonist view and the A-theory of time. As we recall the A-theory is necessary for both the first and second premise of KCA and as we will see an anti-Platonist view is necessary for the first premise of the first argument for the second premise. But given these two positions, there would be an equivocation fallacy involved in this argument, that is a term with multiple meanings would

\textsuperscript{138} Ibid, 69.
\textsuperscript{139} Ibid.
occur in at least two premises in the argument with a different meaning in each premise. *Actual infinite* in the first premise and *actual infinite* in the second premise would have two different meanings so that even if it’s true that an actual infinite in the first sense can’t exist, it does not follow that an actual infinite in the second sense can’t. We will look at why this is the case in 4.1.2. As for the truth of the premises themselves, I grant the second premise and the third premise (we will see why in 4.1.2). I don't, however, grant the first premise, for Craig’s case for it fails, and we have no reason why we should accept it as more plausible than its negation. Let us begin by looking at Craig’s case for the first premise.

4.1.1 Craig’s case for the first premise: The Illustration Argument.

We recall that Philoponus’ first assumption was that an actual infinite is impossible. Craig agrees with Philoponus, but Craig seeks to give a justification for why that is instead of just assuming so. Craig presents two illustrations that involve the instantiation of an actual infinite, and he believes that these illustrations demonstrate how an actual infinite cannot exist outside the mathematical realm in the physical world. The first illustration is the infinite library paradox, and the second is Hilbert’s hotel. These illustration result in similar absurdities as Craig states and so we only need to investigate one of them.

Craig's usage of illustrations is interesting because he assumes that if an illustration that contains an actual infinite ends up in absurdities, then an actual infinite is impossible. This assumption is important to take note of because it is one of the reasons why his argument fails. Craig reasoning from illustrations can be formalized into an argument which we can call The Illustration Argument (IA) and it can be presented as:

1. If there are illustrations that involve an actual infinite and result in absurdities, then an actual infinite is impossible. (Premise 1)
2. Hilbert’s hotel is an illustration that involves an actual infinite. (Premise 2)
3. Hilbert’s hotel results in absurdities. (Premise 3)
4. An actual infinite is impossible. (Conclusion from premise 1, 2 and 3)

140 Ibid, 84.
The argument is valid in form, and the second premise is uncontroversial. The first premise is the assumption mentioned above, and the third premise is Craig’s claim about the results he gets from Hilbert’s hotel. Craig does not believe that the first premise can be denied\textsuperscript{141}. He thinks the only option is to reject the third premise. But it is, in fact, possible to deny the first premise as well, and we should deny it because it is false. Let us start by looking at why the first premise is false before we get into why the third premise of IA is false as well.

### 4.1.1.1 IA: The first premise

Let us assume that the third premise of IA is true. The question now becomes, are the absurdities in the illustration a result of the nature of the actual infinite or are they generated by something else in the illustration? If they are a result of something else then the first premise is false, for then an illustration can involve an actual infinite, the illustration can result in absurdities, and yet the illustration serves as no evidence that an instantiation of an actual infinite is impossible.

Let’s first start by looking at what is called the infinite hotel paradox, also known as Hilbert’s hotel because the German mathematician David Hilbert introduced it. Craig asks us to imagine a hotel with an infinite number of rooms. All these rooms happen to be occupied, so the hotel is full. Now imagine a new guest asks for a room, and the owner of the hotel decides to give him one by making a room empty. The owner moves the guest in room 1 to room 2, the guest in room 2 is moved to room 3 and so on ad infinitum. Room 1 has now become empty, and it is given to the new guest. Craig points out that before the move was made, the hotel was full, but now it has an empty spot even though no guest checked out. Craig finds this to be completely absurd\textsuperscript{142}.

This is not the only absurdity Craig sees. Craig draws out a few more. Craig points out that if the hotel is full and an infinite number of new guests arrive, then the guest in room 1 can be moved to room 2, the guest in room 2 can be moved to room 4, the guest in room 3 can be

\textsuperscript{141} William Lane. Craig, \textit{On Guard: Defending Your Faith with Reason and Precision} (Colorado Springs: David C. Cook, 2010), 82.

\textsuperscript{142} Ibid, 80.
moved to room 6 and so on ad infinitum. In other words, each guest moves to the room that has as its number two multiplied by the number of the room she is currently in. All the odd numbered rooms would become free, and the new guests can each be given a room with an odd number. For there are infinitely many odd numbers, thus each new guest can be given a room. Before the move was made the hotel was completely full, yet by simply moving the guests, we were able to fit in an infinite number of new guests. Craig finds this to be even more absurd than the previous absurdity. Craig is not done, he goes on to point out that if all the guests in the odd-numbered rooms now check out, then an infinite number of guests have left, yet the total number of guests has not decreased, for the number of guests remain infinite, which Craig again finds to be completely absurd. Craig further points out that if all the odd-numbered guests check out, then the hotel is half full. If we just do the reverse of what we did when we produced the second absurdity, then we will go from a half full to a full hotel, yet no new guests have checked in which again he finds to be absurd.

The fifth and last absurdity Craig points out is related to the third absurdity. If instead of having all the odd-numbered members check out, let’s have all the guests check out except for those in room number 1, 2 and 3. The number of guests went from an infinite number to a finite number. The same number of guests checked out now as when we only had the odd-numbered guests check out, namely, an infinite number of guests checked out both times, yet the number of remaining guests is different this time. Craig believes this is a logical contradiction, he argues that we subtract identical quantities from identical quantities, yet we come up with different results, in the first case the result was infinite, and in the second case, the result was finite.

Craig’s claims that these five absurdities show the impossibility of an instantiation of the actual infinite. Whether or not these results are absurd is irrelevant here. What we are interested in is what the cause for the absurdities are. Morriston points out that the cause of these so-called absurdities is not the actual infinite, but rather, it is a result of how the elements interact with
each other in the illustration\textsuperscript{146}, a point Oppy makes as well\textsuperscript{147}. There are two elements in the hotel illustration, the guests, and the rooms. These two elements bear a relationship to each other, a guest is either in a room, or the guest is not. This relation is changeable, a guest can check in, a guest can check out, and a guest can change rooms.

All of the five absurdities Craig produced involved a manipulation of the relation between the elements; he either has the guests check out, or he has them check in, or he has them change rooms. Morriston points out that if we altered the illustration a little and made it impossible to change the relationship between the guests and the rooms, then Craig couldn't draw any of the five absurdities\textsuperscript{148}. This proves that the absurdities are not the result of the actual infinite itself, but rather, they are the result of the possibility of a change happening between the infinite elements in the illustration. Morriston further points out that an infinite regress of past events does not have a changeable relationship between its elements. Thus, the regress is not manipulatable the way Hilbert Hotel is, and so Craig cannot produce the absurdities with a beginningless universe that he was able to produce with an infinite hotel. For past events are fixed in their temporal locations and cannot be moved, we cannot move what happened in 1842 to 1942, and that is the case regardless whether the past is finite or infinite\textsuperscript{149}.

Thus, the possibility of a beginningless universe is unaffected and safe from the harm of any of the alleged absurdities produced from Hilbert's hotel. So, the first premise of IA is false since illustrations that both involve an actual infinite and result in absurdities don't disprove the possibility of an actual infinite like that of an infinite temporal regress of past events.

\textit{4.1.1.2 IA: The third premise.}

Craig called the five results he produced from Hilbert's hotel for absurdities, and he asserted that an instantiation of the actual infinite is impossible because of these so-called absurdities. But are these results that Craig produced really absurd? For an answer, we should

\textsuperscript{147} Graham Oppy, "Craig and the Kalam Arguments," in \textit{The Kalam Cosmological Argument, Volume 1: Philosophical Arguments for the Finitude of the Past} (Bloomsbury Studies in Philosophy of Religion), ed. Paul Copan and William Lane Craig (Continuum-3PL, 2017), 137.
\textsuperscript{148} Ibid.
\textsuperscript{149} Ibid, 297.
first try to understand what the word *absurd* really means. The etymology of the word *absurd* comes from the Latin word *absurdus* which can be translated as irrational. The Oxford Dictionary defines the word *absurd* as: “wildly unreasonable, illogical or inappropriate“150. This definition somewhat agrees with the philosophical definition of the word which is: “an obvious and undeniable contradiction or incoherence in a belief or a proposition, such as 'square is a circle’“151. I say somewhat because something can still be logically possible (does not violate the laws of logic) and yet be wildly unreasonable or inappropriate. For example, we would deem someone who bets all their life savings on a horse that has lost every race and has never won a race as wildly unreasonable, but such a person did not violate of any of the laws of logic. Also, if someone’s behavior does not fit the expected one, for example, if we find someone wearing an animal costume and singing in a university library, then we would deem that person’s behavior as absurd even though such a person has not done anything illogical.

The word *inappropriate* is usually asserted of behaviour, and so I will only focus on *illogical* and *unreasonable* when I am talking about the results of Hilbert's Hotel. Now the problem with deeming something unreasonable if it’s not illogical is that it is a subjective evaluation. What I find to be reasonable someone else might deem ferociously unreasonable. For example, Craig found it unreasonable to think that something could come from nothing, but other philosophers didn't find it to be unreasonable. If these results Craig produced from Hilbert's hotel are not only logically possible, but we can make sense out of them and find reasonable philosophers who also make sense of them, then I don't see how they can be deemed absurd.

Now, not only can we show that these results are not illogical, but we can also make sense out of them because of set theory. So, before we address the five so-called absurdities let us give a very brief introduction to set theory. Set theory is a branch of mathematics that deals with sets. A set is a collection of elements. The sets that set theory is particularly interested in are actual infinite sets, and for this reason, we can refer to set theory as the mathematics of the actual infinite.

The notions of subsets, supersets, proper subset and the correspondence principle are crucial to see why Craig’s “absurdities” are not absurdities at all. A subset is a set whose members are all part of another set, and a superset is a set that contains all the members of another set. For example, if all the members of set A are members of set B, then set A is a subset of B, and in turn, set B is a superset of A. If it is the case that all the elements of a subset are in the superset, but the superset contains at least one object that is not in the subset, then such a subset is called a proper subset.

The correspondence principle states that if a one-to-one correspondence between two sets can be established, then the two sets are equivalent. By a one-to-one correspondence, we mean that the elements of each set can be paired with each other, such that each element from one set has a unique element from the other set which it is paired with and no element remains unpaired. For example, the set \{1,2,3,4\} whose elements are 1,2,3 and 4 is equivalent with the set \{2,4,6,8\} whose members are 2,4,6 and 8 because we can put them in a one-to-one correspondence. Here is a simple illustration of the one-to-one correspondence:

\[
\begin{array}{cccc}
{1, & 2, & 3, & 4} \\
\downarrow & \downarrow & \downarrow & \downarrow \\
{2, & 4, & 6, & 8} \\
\end{array}
\]

The size of a set is known as the cardinal of the set; a cardinal number is the measure of the size of a set, by size we mean the number of elements in the set. Two sets that have a one-to-one correspondence have the same cardinal. The cardinality of the set of natural numbers cannot itself be a natural number. The reason is that every natural number has a successor (we will prove this in 4.3). If one were to pick out a natural number as a suggestion for the cardinality of the set, then that natural number would have to be greater than every natural number except the last one in the set, which is impossible for every natural number has a successor. For this reason, the cardinal number of the set of all natural numbers is not taken to be a natural number. Rather transfinite cardinal numbers are used. The set of natural numbers is an actual infinite set and \(\aleph_0\) is the transfinite cardinal number that denotes its cardinal size. If a set has a one-to-one correspondence with the set of natural numbers, then its cardinal size is \(\aleph_0\).
The German mathematician Georg Cantor wanted to develop a set theory that could serve as a foundation for mathematics. In Cantor’s system, an actual infinite set was defined as a set that is not finite, and a finite set was defined as a set that does not have a one-to-one correspondence with any of its proper subset. Thus, in Cantor’s system an actual infinite set is defined as a set that has a one-to-one correspondence with one of its proper subsets\(^\text{152}\).

This might at first seem "absurd", for how can a proper subset which is a part of a superset be equivalent to its superset when it is but a part of the superset? This surely violates Euclid’s rule, which states that the whole is greater than any of its parts\(^\text{153}\). This rule, however, is only true for finite sets. Euclid's rule does not apply to actual infinite sets. Let us demonstrate this. The set of natural numbers and the set of even positive integers can be put in a one-to-one correspondence which means that both have a cardinality of \(\aleph_0\) and are thus equivalent even though the set of even integers is a proper subset of the set of natural numbers. Here is an illustration:

\[
\begin{align*}
\text{Natural numbers} \\
\{1, 2, 3, 4, 5, \ldots\} \\
\downarrow \downarrow \downarrow \downarrow \downarrow \rightarrow \text{Ad infinitum} \\
\{2, 4, 6, 8, 10, \ldots\} \\
\text{Even integers}
\end{align*}
\]

Now, set theory provides us with a definition for actual infinite sets, but we need to differentiate between this definition and the Aristotelian definition of the actual infinite. The Aristotelian definition which we gave in Chapter 2 states that something is an actual infinite if it is a complete infinite that exists in reality. Cantor's definition, on the other hand, defines the actual infinite as a set that is equivalent to one of its proper subsets. To make sense of this, we can appeal to a distinction Craig makes. There is a difference between mathematical existence and real-world or metaphysical existence. The first relates to abstract mathematical objects like sets, series, sequences, numbers, functions and so on. Such objects are purely conceptual and are

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mind-dependent. This type of existence should not be understood literally, for Craig says that he is not endorsing two types of existence, rather existence here just means mathematical legitimacy, that is that the concept is coherent and can be utilised in mathematical practice. Metaphysical existence, on the other hand, is literal existence. It refers to existence in the mind-independent external world, the world in which we find stones, hills, mountains, animals and humans\(^{154}\text{155}\). If we are talking about something that is infinite and exists in the external world, then we are concerned with Aristotle's definition of the actual infinite and such a thing would have a metaphysical existence. If, on the other hand, we are strictly dealing with sets, then we are talking about Cantor’s definition and such sets can only exist in the sense that they are mathematically legitimate. There is a view in the philosophy of mathematics called Platonism (also called Mathematical realism) that does not differentiate between mathematical and metaphysical existence. Platonists believe that abstract mathematical objects have metaphysical existence, and thus for them, sets are as real as humans, stones and animals. We will come back to this position later.

The set theory Cantor developed was called naïve set theory. According to naïve set theory, there is a set that corresponds to any property that is specifiable. For example, if we take the property “being a negative number”, we get a set that corresponds to this property, which is the set of all negative numbers. This loose criteria of what defines a set led to several problems, one of which is called Russell's paradox. Consider the property “set which does not contain itself”, and call the set that corresponds to this property S. So, S is a set whose elements are only sets which do not contain themselves. Now, is S a member of itself? If you answer yes, then it will lead to the conclusion that it can’t be a member of itself, if you answer no then it will lead to the conclusion that it must be a member of itself. Because if S is a member of itself then S is a set which does not contain itself, and so it cannot be a member of itself by definition, but if you say S is not a member of itself then it must be member of itself because S is the set of sets that do not contain themselves\(^{156}\).

\[^{155}\text{Jacobus Erasmus, The Kalām Cosmological Argument: A Reassessment (Cham: Springer International Publishing, 2018), 83.}\]
This contradiction threatened set theory and a couple of solutions were proposed. The most popular and accepted amongst these solutions was to turn set theory into an axiomatic system. An axiomatic system is a group of propositions called axioms out of which we can derive other propositions referred to as theorems. The most popular axiomatic set theory became known as ZFC, which stands for Zermelo-Fraenkel set theory with the axiom of choice\(^{157}\). The axioms of ZFC prevent the occurrences of paradoxes such as Russell’s paradox. In ZFC the actual infinite is defined the same way as Cantor defined it, and the terminology (subset, proper subset, superset) is the same\(^{158}\). ZFC also saves Cantor’s project of having set theory as the foundation of mathematics for ZFC can serve as the foundation of most of mathematics because most of the theorems of mathematics are deducible from the axioms of ZFC\(^{159}\).

Going back to Craig, we can analyse Hilbert’s hotel in the language of set theory by thinking of the hotel as an actual infinite set. This will show that the results produced by Craig are not absurd. Let’s start with the first one, Craig found it absurd that we can fit a new guest by just moving the guest, but this is not absurd at all, for arithmetic operations with transfinite numbers are different from those of natural numbers. We don't get results like \(2+1=3\) and \(2+2=4\) when it comes to transfinite numbers rather we get results like \(\aleph_0+1=\aleph_0\) and \(\aleph_0+2=\aleph_0\) and so on ad infinitum. Thus, we can add as many guests as we want by simply moving the guest. Even an infinite number of new guests can be added for \(\aleph_0+\aleph_0=\aleph_0\). This is because the addition of two sets is defined as the union of the two sets. A union of two sets is a set that contains the elements that are common in both sets and the elements that are exclusive to each set, and it is denoted by \(\cup\). If \(X = \{1,2\}\) and \(Y = \{2,3,4\}\) then \(X \cup Y = \{1,2,3,4\}\). To see why there is no absurdity in more details, let’s call the set of all the guests in the hotel \(A\), the set of all rooms \(B\) and the set of the new guest \(C\), if \(A = \{1,2,3,...\}\), \(B = \{1,2,3,...\}\), and \(C = \{1\}\), then \(A \cup C = \{1,2,3,...\}\), \(A \cup C\) would be the set of all guests including the new guest. We can assign each guest in \(A \cup C\) a room in \(B\) because we can put \(A \cup C\) in one-to-one correspondence with \(B\). Set union shows that the second assumption Philoponus’ worked with was mistaken, the assumption that an infinite cannot be added to.


The second “absurdity” was that we could fit an infinite number of new guests into a full infinite hotel by simply moving each guest to another room whose number is the guest’s previous room number multiplied by two. This would make all the odd-rooms empty, which we then assign to the new guests. There is nothing absurd about this for as we recall \( \aleph_0 + \aleph_0 = \aleph_0 \) and the set of natural numbers is equivalent to the set of even integers, the same goes for odd integers, the set of odd integers is infinite and is thus equivalent with the set of natural numbers.

The third “absurdity” was the fact that if all odd-numbered guests check out, then the total number of guests would not decrease, even though an infinite number of guests checked out. This is simply because both the set of natural numbers and the set of even positive integers have a cardinality of \( \aleph_0 \), so there is nothing absurd about the fact that an infinite number of guests remain. As for the fourth “absurdity”, we recall that it was the fact that if all the odd-numbered guests check out, then we can go from a half full to a full hotel by doing the exact reverse of what we did when we created empty spaces in the odd-numbered rooms. This is not absurd at all for the set of odd positive integers can be put in a one-to-one correspondence with the set of even positive integers which in turn can be put in a one-to-one correspondence with the set of natural numbers.

The fifth is a bit more interesting, for Craig claims a logical contradiction is involved, and if that is the case, then Craig can call such a result as absurd. Craig argued that if we subtract identical quantities from identical quantities, then we should get the same result each time, yet in the case of the infinite hotel, we come up with different results. When it comes to transfinite numbers, even though addition can be performed subtraction cannot. The reason is that subtraction would produce contradictory results similar to the one Craig produced. So, subtraction remains undefined for transfinite numbers, there is no definition of what infinity minus infinity would yield. Craig has no problem with leaving this undefined, but he points out this only applies to the world of mathematics and such condition would not apply to reality, for we cannot stop real people from checking out of a real hotel\(^{160}\).

Craig is correct, we can’t stop people from checking out from the hotel, and we cannot claim this is impossible because subtraction is undefined since we are talking about an instantiation of an actual infinite in the physical world and not about sets. But the point that we

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\(^{160}\) William Lane Craig, *On Guard: Defending Your Faith with Reason and Precision* (Colorado Springs: David C. Cook, 2010), 83
are dealing with the physical world is a point that is problematic for Craig's case since subtraction is an arithmetic operation that is concerned with abstract mathematical objects (numbers) that have a mathematical existence and not objects with metaphysical existence in the physical world. Morriston makes an excellent point when he points out that removing a book from an infinite library is not a subtraction in the arithmetic sense\(^{161}\), likewise, a guest who is checking out is by no means "subtracting" himself from the hotel, rather the guest is merely checking out, so Craig is confusing checking out from a hotel with subtraction.

When it comes to objects in the physical world, arithmetic is just a tool we can use for measurements and calculations. For example, in the case of hotels, we can use it to calculate how many guests remain, in which we take checking out to be similar to subtraction, but this tool is only useful in dealing with hotels that have a finite amount of rooms. If we had an infinite hotel in the physical world, then subtraction would be a useless tool to use for as stated above, subtraction is undefined for transfinite numbers. The correct tool to use if we wanted to calculate the numbers guests after a check in or check out from an infinite hotel is the set-theoretic operation of intersection.

An intersection of two sets is the set that only contains the elements that are common in both sets and is denoted by \( \cap \). If \( X = \{1,2\} \) and \( Y = \{2,3,4\} \) then \( X \cap Y = \{2\} \). We can take the guests who are checking out to be a subset of all the guests that are in the hotel; the intersection of the subset and the superset would then be the set of remaining guests. Let Set A be all the guests that are in the hotel, Set B be the odd-numbered guests and C be all the guests except for those in room number 1, 2 and 3. \( A \cap B \) would then be the remaining guests after all the guests check out in the first case and \( A \cap C \) in the second case. If \( A = \{1,2,3, \ldots\} \), \( B = \{1,3,5, \ldots\} \), and \( C = \{4,5,6, \ldots\} \), then \( A \cap B = \{2,4,6,\ldots\} \) and \( A \cap C = \{1,2,3\} \). The cardinality of \( A \cap B \) is \( \aleph_0 \), while that of \( A \cap C \) is 3. So, when all the odd-numbered guests check out \( A \cap B \) remains and when all the guests except for those in room number 1, 2 and 3 check out \( A \cap C \) remains. So, there is no logical contradiction when it comes to the fifth result for Craig stated that the contradiction was a result of subtraction\(^{162}\) but in this case, we are not subtracting at all, since subtraction is useless.

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in this case. Instead, all we are doing is looking at the cardinality of the intersections. So, there is neither a logical contradiction here, nor is anything absurd.

Let us summarise. None of the alleged absurdities that Craig produced from the infinite hotel is absurd for none of them were wildly unreasonable once looked at through the lens of set theory and the fifth alleged absurdity is not illogical. So, we can dismiss Craig's assertion that these results are absurd since they are not illogical, we can make sense of these results with set theory, and we have greater thinkers like Mackie and Oppy who agree that given set theory these results are not absurd. Thus, there is no reason why we should not think that these results are possible in the real world, given the fact that they are not absurd. We also see that the first assumption of Philoponus, which was that actual infinite couldn't exist in reality is unjustified given set theory and that his second assumption which was that an infinite couldn't be added to is false.

4.1.1.2.1 Craig’s first objection to using set theory.

We argued that set theory demonstrates that these so-called absurdities are not absurd. Critics of KCA commonly give this argument, for example, we find this argument in Mackie's critique of KCA, and Oppy repeats it in his defence of Mackie's critique of KCA. Craig responds to this argument by saying that it confuses mathematical existence with metaphysical existence. Craig states that ZFC set theory shows that the notion of an actual infinite set is coherent given a number of axioms, and this allows us to attribute mathematical existence to it, which as we recall was nothing more than mathematical legitimacy. But this by no means entails that an actual infinite could have metaphysical existence. It is for this reason that we find multiple views in the philosophy of mathematics that accept the mathematical existence of the

actual infinite but rejects its metaphysical existence. An example of such a position is Conceptualism a view that takes mathematical objects like sets to be ideas created by the mind and the view does not hold that such objects have a mind-independent existence.\textsuperscript{168}

Craig states that the coherency of actual infinite set established by ZFC would only entail metaphysical existence if mathematical existence entailed metaphysical existence; in other words, if Platonism was true. Craig states that for this reason, the critic who appeals to set theory must first prove that Platonism is true or else the critic has done nothing more than to show that actual infinite sets are coherent mathematical concepts.\textsuperscript{169} Craig's reasoning here is, however, fallacious. For he is shifting the burden of proof. The burden of providing justification is upon the person making a claim as long as the claim made requires justification. Craig is claiming that an actual infinite can't exist in reality even though it is a coherent concept, which amounts to him saying that Platonism is false, and in that case, Craig has to provide an argument for why Platonism is false. Without a reason to think that Platonism is false, we are justified in think that it is plausible, and if Platonism is plausible, then the first premise of the first philosophical argument is unjustified.

Oppy makes a similar point; he argues that set theory shows that an actual infinite is logically possible and that this is sufficient for the first premise of the first philosophical argument to be rendered unjustified.\textsuperscript{170} Craig replies to Oppy by arguing that the mere freedom from logical inconsistency is no indication of metaphysical possibility which is necessary for something to exist in the physical world.\textsuperscript{171} This is true, but the burden to show that it is metaphysically impossible is upon Craig, not Oppy. So why think it is metaphysically impossible? Craig answers that this is because the results produced by illustrations like Hilbert's hotel are so counter-intuitive that it's obvious that they could not exist in reality.\textsuperscript{172}

So, Craig is appealing to intuition, and the question becomes whether it is the philosophical intuition or the cognitive intuition. If it is the philosophical intuition, then we can

\begin{itemize}
\item \textsuperscript{168} Quentin Smith and William Lane Craig, \textit{Theism, Atheism, and Big Bang Cosmology} (Oxford: Clarendon Press, 1995), 121.
\item \textsuperscript{172} Ibid.
\end{itemize}
make the same argument that we made with *ex nihilo nihil fit*. That is Craig has to give an explanation for why there are reasonable philosophers that don't find these results to be intuitively impossible. For example, Mackie says that the impossibility of an actual infinite cannot be established *a priori*\(^{173}\), and Smith finds such results to be plausible given the fact that Euclid's rule doesn't apply to actual infinite sets\(^{174}\). If it is the cognitive intuition that Craig appeals to, then we will deal with that in 4.2.

4.1.1.2.2 Craig’s second objection to using set theory.

As we recall the results of Hilbert’s hotel were neither absurd, illogical nor ferociously unreasonable since the principle of correspondence applies to actual infinite sets while Euclid's rule doesn't. Craig objects to this by asking why we apply one principle and not the other to the hotel. Craig says that the reason why the counterintuitive consequences of Hilbert's hotel come about is due to the principle of correspondence. Craig argues that the principle of correspondence is merely a convention adopted in set theory and that the exclusion of actual infinite sets from Euclid's rule is merely an arbitrary decision made to make set theory coherent. Craig points out that one can neither prove that the principle of correspondence would apply to instantiations of the actual infinite in reality, nor can one prove that Euclid's rule wouldn't apply to them. Craig points out that all we can confirm through empirical observation is that both apply to finite sets\(^{175}\), for example by showing that a collection of ten coins has the same cardinality as a collection of ten pebbles by putting them in a one-to-one correspondence, or by showing that a slice is smaller than the whole cake. However, we have no means for proving that one applies to the infinite while the other doesn’t.

Craig further asserts that both principles seem intuitively true, and he states the obvious that both cannot apply to infinite sets, for if they did, then we would get logical contradictions, such as the set of positive odd integers being both equal to and smaller than the set of natural numbers. But instead of sacrificing one principle, Craig argues that since when each is applied to

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an instantiation of the actual infinite counterintuitive consequences occur, we should instead accept both principles and dismiss the possibility of an instantiation of an actual infinite.\textsuperscript{176}

We already dealt with the claim that the results are counterintuitive in the philosophical sense if we only apply to the principle of correspondence to the infinite hotel. We will deal with counterintuitive in the cognitive sense in subsection 4.2. So, this particular objection is no different than Craig's previous objection. Craig could still object by saying that we are not justified in dismissing Euclid's rule and only applying the principle of correspondence to the infinite hotel for how do we know that Euclid's rule wouldn't apply to an infinite hotel in the physical world and how do we know that the principle of correspondence would? If I were to say that's how it’s done in set theory, then Craig would simply say that the dismissal of Euclid’s rule is just an arbitrary decision made by mathematicians, and so it doesn’t follow that it wouldn't apply to actual infinities in the physical world. The same thing goes for the principle of correspondence, it is but a convention adopted for coherence, and so it doesn’t follow that it would apply to actual infinities in the physical world.

Craig is correct; we neither know if the principle of correspondence would apply to an infinite hotel, nor do we know if Euclid's rule wouldn't. We only assume that would be the case, but that’s because we treat the infinite hotel as an actual infinite set and an actual infinite set is by definition a set that has a one-to-one correspondence with one of its proper subsets. And we have to do this because an actual infinite in the Aristotelian sense is a complete mystery to us for we have never encountered anything that is infinite, so we cannot imagine how an infinite hotel would actually behave if it existed somewhere in the physical world. The only way we can demystify actual infinities in the physical world is by thinking of them as actual infinite sets.

Craig himself treats the infinite hotel as an actual infinite set, which is why he doesn't apply Euclid's rule to the hotel. If Craig didn't do this, then he wouldn't be able to produce the so-called absurdities. For example, the third so-called absurdity was that if all the guest in the odd-numbered rooms left, then an infinite number of guests would have been removed from the total number of guests without the number decreasing. This would only be the case if we applied the principle of correspondence and not Euclid's rule, or else the remaining guests would be smaller. If the hotel in the thought experiment were not treated as an actual infinite set, then Craig wouldn't be justified in doing this, for how does he know that Euclid's rule wouldn't apply to a

\textsuperscript{176} Ibid.
hotel that is infinite in Aristotle's sense? He doesn't since such a hotel would be a complete mystery.

So, when Craig says that we are unjustified in applying the principle of correspondence and not Euclid's rule what he is saying is that we are unjustified in treating the infinite hotel as an actual infinite set. Now if we are not justified in treating the hotel as an actual infinite set, then Craig's IA falls apart since the so-called absurdities only come about because the infinite hotel is treated as an actual infinite set. So, Craig must either accept that the so-called absurdities are not absurdities given set theory, or he can give up on IA and hold the view that treating the infinite hotel as an actual infinite set is unjustified. Either way, Craig's IA fails.

4.1.2 The A-theory of time, Platonism and the second and third premise.

A fact that the critics of Craig's case for KCA have either missed or chosen not to comment on is a confusion that Craig makes regarding sets. My conjecture is that they have missed it because merely pointing the confusion out would show that Craig’s first philosophical argument is invalid something that a critic would be very happy to point out. We recall that the third assumption Philoponus made was that an infinite temporal regress of past days would exist if the universe is past-eternal. Craig makes this assumption as well, and without it, the first philosophical argument would fail as an argument for the temporal finitude of the universe. We presented this assumption as the third premise of Craig’s first philosophical argument.

Landon Hedrick examines this premise in light of the A-theory of time and makes an excellent point which we can present as follows: If time is dynamic and only the present is real as the A-theory states, then how does an infinite regress of events exist if the universe is past-eternal? The past is gone and no longer exists. Thus, past events don't exist. Since there are no past events, it logically follows that there is no infinite number of past events and so there is no infinite regress and therefore, this premise must be false\textsuperscript{177}.

Aristotle made a similar argument over 2300 years ago. Aristotle was of the view that the universe is past-eternal even though he rejected the possibility of an instantiation of the actual infinite, and he gave the same argument as Hedrick did to justify his position\(^\text{178}\). Craig objects to Aristotle by saying that the nonexistence of past events is not a hindrance to the fact that they can be enumerated, for we can mentally group past events into an actual infinite set even if the events don't presently exist. So, an infinite number of past events would exist in this sense. Now if you were to count the events backwards in this actual infinite set, then you would keep regressing infinitely back and so in that sense there would exist an infinite regress of past events if the universe was beginningless\(^\text{179,180}\).

Does this save the third premise of the first argument? It does but only at the cost of rendering the argument invalid. Craig is correct, we could mentally group all the past events into an actual infinite set, and we could keep counting the numbers in the set one by one and by doing so we would keep regressing infinitely. We would have an infinite regress, but such a regress is a regress of elements in a mentally constructed set, and sets are mathematical objects, such objects according to Craig only exist in the mathematical sense which means nothing more than that they are mathematically legitimate. Craig makes a confusion that Karel Hrbacek and Thomas Jeck warns us not to make in their *Introduction to set theory*. They state that sets are nothing more than thoughts we humans create with our minds. They warn us that objects in the real worlds should not be confused with the sets that our minds can form of those objects. They give us an example in the form of potatoes; they state that a bag of potatoes is not the set of the potatoes, the former has a metaphysical existence in the physical world while the latter is nothing more than something our minds create\(^\text{181}\). Craig has confused an infinite number of past events with the set of past events, the former would only exist given B-theory of time, and the latter is nothing, but an idea created in our mind with no metaphysical existence.

The regress Craig talks about would exist in the mathematical sense even if the universe had a beginning, for I can mentally create the set of past events of a beginningless universe whether the universe is beginningless or not. So, the only type of existence we would have if the

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universe is beginningless given the A-theory of time is mathematical existence. But it’s not this type of existence that Craig is talking about when he says that an actual infinite cannot exist for he already accepts that actual infinite sets exist in the mathematical sense. Rather Craig is talking about metaphysical existence. Let us quote Craig directly in order to make this clear:

With regard to the first premiss [An actual infinite cannot exist.], it is important to understand by "exist" we mean "exist in reality", "have extra-mental existence", “be instantiated in the real world". We are contending, then, that an actual infinite cannot exist in the real world. (emphasis mine) 182.

So, while the first premise of the first argument for the second premise is talking about an actual infinite in the Aristotelian sense, the second is talking about an actual infinite in the Cantorian sense. Therefore, there is an equivocation fallacy involved in Craig’s first argument, and this renders the argument invalid. This confusion that Craig makes seems to have gone unnoticed by critics, and if so, then that would explain why no critic has pointed out that the first philosophical argument is invalid, not merely unsound due to one of its premises being false or unjustified.

Craig could save the argument by adopting Platonism. A Platonist would disagree with Hrbacek and Jech, and he would argue that mathematical objects do exist in the real world. As we recall Platonism is the view that abstract mathematical objects exist in a real sense. Since the distinction between mathematical and metaphysical existence is removed given Platonism that would mean there is no equivocation involved. This would, however, render the first premise of the argument false. For if Platonism is true, then that would mean that an actual infinite does exist in the real world for there is an infinite amount of numbers. And if an actual infinite does exist in the real world, then the first premise of the first argument is false. Thus, Craig faces a dilemma; he can either reject Platonism and concede that the argument is invalid, or he can accept Platonism as true and reject the first premise. The first argument would fail either way. Craig himself explicitly rejects Platonism183, which means that he has no choice but to concede that the argument is invalid.

4.2 Cognitive intuition and recognition-primed decision.

Let us now talk about the cognitive intuition. Mackie even though he rejects that the so-called absurdities produced by illustration like that of Hilbert's hotel are in fact absurd, he still admits that people can find them to be counterintuitive\(^{184}\). We can give a reasonable explanation for why that is if we assume that the intuition in question is the cognitive one. This explanation is similar to one some physicists have given for the counterintuitiveness of discoveries made in QM. Why would I use an explanation from QM for the actual infinite? For two reasons, the first reason is that the weird results produced from Hilbert's hotel are not weirder than QM discoveries. I don’t see how the idea that we can create empty space in a full hotel with an infinite number of rooms by merely moving the guests is weirder than the fact that light behaves both as a particle and a wave. Or how the fact that the same number of guests can check out, yet the number of guests that remain can vary is weirder than the fact that by presently observing a particle one changes what has happened in the past something observed in a recent QM experiment\(^{185}\). The second reason is the fact that in our daily experience, we neither encounter anything on the atomic-level nor anything that is infinite, and I will explain why this is significant below.

The aforementioned quantum oddities can be accounted for with a psychological interpretation. One could argue that the problem some people have with accepting these counterintuitive or weird discoveries made in QM is not due to logical, metaphysical or physical impossibilities but merely due to psychological factors. This is pointed out by the physicists Bruce Rosenblum and Fred Kuttner in their book *Quantum Enigma*. They explain that even though QM is ferociously counterintuitive, it still works perfectly fine since the universe does not behave according to our intuitions or how our brains are structured. The fact that our brains are organized in such a way that these results in QM appear weird should therefore not be a concern for physicists. Instead, it should be dealt with by psychologists. Our unease with the


results of QM are due to psychological blocks and not due to something that relates to physics; this they call "The Psychological Interpretation of Quantum Mechanics". We can apply this interpretation to the actual infinite; we could call it The Psychological Interpretation of The Actual Infinite (PIAI). PIAI explains why the results from the infinite hotel illustration appear as counterintuitive and weird as they do, the reason is a psychological block.

This interpretation makes sense considering the way our intuitions are formed according to a recent theory in psychology called Recognition-primed decision (RPD) developed by the influential American psychologist Gary Klein. Intuition according to Klein is not some mystical faculty that we possess that tells us what is metaphysically possible and what is metaphysically impossible, rather our intuition is nothing more than the ability to translate past experience into judgements and decisions. According to Klein, our intuition is formed by previous experience which is why he believes experienced people intuitively make better decisions than inexperienced people; the experienced person has relevant past experience to compare the present with that the inexperienced person lacks and so naturally the experienced person makes better intuitive choices. Klein gives the example of neonatal nurses; an experienced nurse by a simple glance comes to know if a newborn baby has sepsis an ability her inexperienced trainee nurses lacks, and this according to Klein shows that the former’s intuition is better than the latter’s intuition due to experience. Empirical research done on the chess players backs Klein’s theory regarding intuition and experience for the research shows that the intuition of expert chess players is based on their past experiences.

So, it’s not mysterious or surprising why we find QM results or instantiations of the actual infinite counterintuitive since our intuition is after all formed by past experience and as I mentioned earlier, we neither encounter actual infinities in our daily lives nor do we encounter anything on the atomic-level. We recall that Lake stated that if we can explain why something appears to be intuitively the case, then the defeasible justification given by intuition is negated.

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188 Ibid, 18.
Since we can explain why results involving the actual infinite appear the way they do, it follows that our intuition concerning them provides no justification whatsoever. The same goes for ex nihilo nihil fit and CP, it is no wonder that they appear to be intuitively true since everything we experience on the macro-level that begins to exist has a cause.

4.3 The Second argument: Formed through addition.

The second philosophical argument Craig gives is similar to the Mutakalimun’s version of Philoponus’ second argument that we presented in Chapter 2. Craig argues that the universe can’t be beginningless for if it was, then an infinite has been traversed, which is impossible. For the collection of past events is formed by successive addition, events are constantly happening, and when an event occurs it gets added to the collection. If the universe is beginningless, then this collection is an actual infinite. But this collection was formed by successive addition, which would mean an infinite value was reached by successive addition which is impossible since an infinite cannot be traversed, we cannot reach infinity by addition. Thus, the universe had to have a beginning.\(^\text{191}\)

Since Craig is talking about collections of events and we recall sets are collection of elements we can present the argument in set-theoretic terms as:

1. The set of past events is a collection formed by successive union of finite sets. (Premise 1)

2. An actual infinite set can never be the union of two finite sets. (Premise 2)

3. Therefore, the set of past events cannot be an actual infinite. (Conclusion from 1 and 2)

The second premise is the rule we presented in Chapter 2, which we here give in set-theoretic terms. The rule was the age-old rule, which states that it is impossible to count to infinity. If one cannot count to infinity, then that means there are no two finite numbers whose sum is infinity. Since the cardinality of the union of two sets is the number that is the sum of the

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number of elements exclusive to each set plus the number of elements common to both sets, it follows that the cardinality of the union of two finite sets will always be a finite number (given the age-old rule). As for the first premise, we can take a collection formed by successive addition of events to be a set of events that is formed by successive unions of finite sets. Now, this argument is valid, so let us examine the premises starting with the second one.

The second premise is true by definition. This is because of the definition of natural numbers, the numbers that denote the cardinality of finite sets. In modern mathematics the natural numbers are either defined in set theory\textsuperscript{192} or in an axiomatic approach. Taking the latter approach, we can define the natural numbers by the Dedekind/Peano axioms. One of these axioms is that every natural number has a successor (and thus every natural number is finite)\textsuperscript{193}. And from the Dedekind/Peano axioms we can deduce the theorem that the sum of every two natural numbers is always a natural number\textsuperscript{194}. Given this axiom and theorem, the second premise logically follows for the cardinality of the union of any two finite sets is always going to be a natural number (thus finite) since its always going to be the sum of two natural numbers.

Seeing as the second premise is true, and the argument is valid, that means the argument's success depends on whether the first premise is true or not. Craig argues that the collection of past events must have been formed by successive addition given the A-theory of time. For in the A-theory of time events occur, and they do so one-at-the-time. Since the collection is formed by events being added to the collection after they have occurred, and they can only do so one-at-the-time given the nature of time, it follows that the collection is formed by successive addition or in set-theoretic terms, the set of past events is the result of successive unions of finite sets.

Is Craig's argument successful in demonstrating the truth of the first premise? Not at all for Craig's analysis of a beginningless universe is mistaken for it is based on a false assumption. He assumes that there must have been an infinitely distant starting point in a beginningless universe, such that starting from this point we could never reach infinity by successive addition. This assumption is false for a beginningless universe is beginningless, there is no first event, and thus there is no infinitely distant starting point. This mistaken analysis of a beginningless

\textsuperscript{192} Heinz Dieter Ebbinghaus, \textit{Ernst Zermelo: An Approach to His Life and Work} (Springer, 2007), 133.
\textsuperscript{193} Jürg Kramer and Anna-Maria Von Pippich, \textit{From Natural Numbers to Quaternions} (Cham, Switzerland: Springer, 2017), 9.
universe was pointed out by multiple critics of KCA, including Mackie\textsuperscript{195}, Morriston\textsuperscript{196}, Sorabji\textsuperscript{197} and Paul Draper\textsuperscript{198}. They pointed out that only infinite collections with first members can't be completed by successive addition, for we would have to start with a finite value and if we did, then no matter how many finite elements are added the result will always be finite. But they argue that in the case of a beginningless universe there is no first starting point and that from every point in the past the collection of past events is infinite. For from every point in the past, an infinite number of events have occurred. When an event occurs in a beginningless universe that event is not added to a collection of a finite number of past events as it would be in the case of a universe with a beginning, rather it is always added to a collection of an infinite number of past events. So, at no point does the collection go from a finite value to an actual infinite due to successive addition in a beginningless universe and thus an infinite is never traversed.

So, the set of past events is not necessarily finite even though it's formed through successive union of sets. For it could be that each union is a union of an infinite set (set of events occurred up to the one that precedes the last event that occurred) and a finite set (the set containing the last event that occurred). This would be the case in a beginningless universe. Thus, Craig's first premise is not true of all kinds of universes; it's only true of those that have a first event. So, while the second argument makes a universe with an infinitely distant first event impossible, it does not affect the possibility of a beginningless universe with no first event. The only way it would is if Craig made the same assumption that the Mutakalimun made, which was that everything that has an end must have a beginning such that a collection couldn't exist without a first member. Until Craig provides a justification for this assumption, it remains the case that his second argument fails. Moreover, this assumption would make the second philosophical argument superfluous for this assumption alone would make a beginningless universe impossible. Since the collection of past events in a beginningless universe would be a

collection without a first member and if such a collection is impossible, then a beginningless universe would be impossible.

4.3.1 Craig’s first objection.

Craig replies to the critics by arguing that a new problem would arise if there is no infinitely distant starting point. The problem is that the collection cannot even begin to be formed. In order for the collection of past events to be formed, the event that came right before the present moment must have been added to the collection. Now the event that precedes the present moment is only added to the collection once it has passed, and this is problematic according to Craig. For he argues that before the preceding event could pass the event that came before it must pass, but before that event can pass the one before it must pass and so on ad infinitum. We will keep regressing back, never reaching a stopping point since there is no first member. And since there is no first member, the collection will never begin to be formed. This is absurd, according to Craig for the collection has been formed, since the event preceding the present moment has happened, and thus it follows that the collection of past events cannot be beginningless.

To say that the collection of past events could not have been formed unless the event that preceded the present moment had occurred is no different than to say what the Mutaklimun did, namely that the present could only be occurring if the event that preceded it occurred. Craig here is presenting a new argument; he is no longer arguing that a beginningless universe is impossible because an infinite would be traversed, rather he is arguing that the present could not have occurred if there was no first event. Craig is no longer using the age-old rule that traversing an infinite is impossible. Instead, he is relying on the other assumption the Mutakallimun made, which was that an event could only happen if the event that precedes it has occurred.

This new argument is almost identical to the one that the Mutakalimun made except for one difference, which makes Craig’s argument better. The Mutakalimun reasoned that in a past-eternal universe, the present couldn't have occurred because that would mean a distance would

have been traversed from an infinitely distant starting point. So unlike Craig's new argument, the Mutakalimun utilized the age-old rule in their argument, and this required that they assume that every collection with an end-point has a beginning. Craig’s new argument does not rely on the age-old rule, so he does not need to make this assumption, the only assumption he needs is that an event can only occur if the event before it has occurred. This makes Craig’s argument better for the Mutakalimun’s argument also require the latter assumption and so Craig’s argument requires one less assumption than theirs.

Let's call this new argument for The First Event Argument (FEA) and present it as follow:

1. If the universe is beginningless, then there is no first event. (Premise 1)
2. If it is the case that an event can only occur if the event before it has occurred, then there is a first event. (Premise 2)
3. It is the case that an event can only occur if the event before it has occurred. (Premise 3)
4. Therefore, there is a first event. (Conclusion 1 from premise 2 and 3)
5. Therefore, the universe began to exist. (Conclusion 2 from conclusion 1 and premise 1)

Morriston and Stephen Puryear have criticised this argument. Morriston argued that the argument is unsound because the second premise is false and Puryear has argued that it’s the first premise that is false. Both of their arguments fail as Jacobus Erasmus has pointed out. Fortunately, a good argument can be given against FEA by targeting the third premise instead of the first or second. Before I present such an argument, I will go through the arguments offered by the two critics and show why they fail. This is because I want to be fair to the critics by not just dismiss their arguments as bad without explaining why they are so.

Let us begin with Morriston’s argument. Morriston accepts the third premise; he agrees that before the present moment could occur, the event before it must have occurred and before that event could have occurred the one before it must have occurred and so on ad infinitum. Morriston, however, disputes that this is a problem for a beginningless universe; he rejects the second premise. Morriston argues that in a beginningless universe the event that precedes the
present moment has occurred because the event before it has occurred, and that event, in turn, has occurred because the event before it has occurred and so on *ad infinitum*. So, for Morriston, a first event does not follow from the assumption that an event can only occur if the event that precedes it has occurred.

Morrison’s argument fails because as Erasmus points out, Morriston is begging the question, that is he is assuming the conclusion he seeks to prove to be true. All that Morriston is saying is that if we are in a beginningless universe, then all past events have occurred. But the point of Craig’s argument is that all past events could not have occurred in a beginningless universe, so by assuming that they did one ignores Craig’s argument and just takes the very thing in dispute to be true. Morriston says that the event that precedes the present moment would have occurred because the event before it has occurred and so on *ad infinitum*, but this infinite backward push is precisely what renders impossible the occurrence of the event that precedes the present moment.

Puryear argues that there is no reason why we should conceive of the past as a sequence of multiple events. Instead, he says that we can take it to be a single infinitely long event. In this case, only a single event has occurred. Since only one event occurs, the third premise is rendered void, for it cannot be applied to the beginningless universe anymore since there is only a single event and no event that precedes it. This also makes the first premise false, for if only a single event has occurred, then that event is the first event of the beginningless universe.

There are two problems with this argument that Erasmus points out. The first is that an event is a change from one state to another state, which means that an event has a beginning and an end. Since the past would only consist of one event that would mean the past has a beginning, and thus the universe couldn’t be beginningless by definition. The second problem is that there is something that is constantly being added to the past as the future is being constantly actualized (given the A-theory). If the past is a single event, then what is being constantly added to it? It would seem events are, but if that is the case, then how could the past be a single event? By the time you finish reading this sentence, another event would have been added, and thus, the past

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would consist of at least two events. So, given these two problems, Puryear’s argument fails. A third problem one could point out is that if the past is only a single infinite event, then that would mean an infinite would have to be traversed for the event to occur. The reason is that as we just said, an event is a change with a beginning point and an end point, and the distance between the two would be infinite in an infinite event. Since an infinite cannot be traversed, it follows that a single infinite event is impossible.

Seeing as the counter-arguments of the critics of KCA fail in countering Craig's FEA, it appears that there is still work that needs to be done in countering Craig's case for KCA. The argument that I am about to give not only does this work of countering FEA, but its conclusion also serves as the key premise of a sound argument for the negation of the second premise of KCA. Let us begin with the argument that counters FEA. Given the A-theory of time it must be the case that if the universe exists, then the third premise of FEA is false and that either the universe is beginningless or that the beginning of the universe is the last effect in an infinitely long chain of causes and effects. In the latter case, God would play no role in creating the universe for it is impossible for him to be part of the chain, this nullifies KCA for the purpose of the argument is to prove the existence of God.

If the universe exists and it's not the product of such an infinite chain, then the universe must be beginningless. For if it's not the product of such a chain, then there are only three options for the universe having a beginning and each of them is impossible. These three options are either that the universe was created by God a finite time ago, it began uncaused a finite time ago, or it was caused to begin a finite time ago by something that is neither God nor part of an infinite chain of causes and effects. Since the universe exists, these three options are all impossible, the universe could not be beginningless if the third premise of FEA is true and the universe couldn't exist if it’s not beginningless (assuming it’s not the product of an infinite chain either), it follows that the third premise of FEA is false and that the universe is beginningless.

Let us begin with the first option, God creating the universe. Craig defines God as a being that is uncaused and beginningless. There are two views one can hold regarding the beginninglessness of God, either that God is beginningless in the sense that he has existed for an
infinite amount of time without a first moment or that God is beginningless in the sense that he is atemporal, that is that God exists outside of time. Craig believes that God without the universe is atemporal and with the universe, God is temporal205. Craig holds such a view of God because he wants to avoid the existence of an actual infinite and still maintain the omniscience of God, that is the view that God is all-knowing. This needs a little explaining.

Let’s first look into the omniscience problem. If God is atemporal with and without the universe, then he wouldn't be omniscient. The reason God wouldn't be omniscient is due to tensed facts. Tensed facts are facts about the past, the present, and the future, and tensed facts are only facts in relation to the present. If we are in 2019, then the proposition "It is 2019 now" is a fact at the present moment, but it will cease to be a fact next year. Now going back to the omniscient problem, God needs to know tensed facts in order to be omniscient. However, in order to know tensed fact, God cannot be atemporal, for tensed facts are facts in relation to the present, and the present is constantly changing given the A-theory of time for time is constantly moving from the present to the future. So, in order to know tensed facts, one's knowledge has to be constantly changing as well. Now if God's knowledge is constantly changing, then he is temporal, for if there is change, then there is some form of time for time is the measure of change and so his knowledge can't be changing while he remains atemporal. The actual infinite problem is related to Craig's first philosophical argument for the second premise. If God existed in time with and without the universe, then he would have existed for an infinite amount of time. Since God would have existed for an infinite amount of time, then that would mean there is an infinite number of past events. This Craig takes to be problematic because he believes an infinite number of past events is metaphysically impossible as we mentioned above206.

To avoid these two problems, Craig holds that God exists atemporally without the universe and that he is temporal with the universe. Without the universe, there are no tensed facts, and so the omniscience problem is avoided. Moreover, there would be no infinite number of past events in which God has existed for he is atemporal. With the universe, God would be temporal, and so he would know all tensed facts. Moreover, God's temporal past would be just as

206 Ibid.
old as the universe itself and since the universe has a finite past according to Craig, so does God's past, and hence there is no infinite number of events.

Craig uses the locution "without the universe" often when talking about God's relation to time, and this could be because the phrase "before the universe" or "prior to the universe" would cause confusion since the words “before” and “prior” are taken to be temporal. If time only exists with the universe, then it makes no sense to say prior to or before the universe. Now the question to ask is could such a God have created the universe? No, he couldn't. Craig states that with the creation of the universe, time begins, and that God enters time at the moment time begins\(^{207}\). This implies that the state of God changes from atemporality to temporality. Chang is a temporal notion, so something that is atemporal does not have the potentiality of changing. So, Craig's conception of God is incoherent. Moreover, creating or causing to come into existence is a temporal action and thus something that is atemporal could not cause the universe to begin to exist.

What about a God that is temporal with or without the universe could such a God create the universe? Not with the third premise of FEA being true. For before the event "God creates the universe" could occur the event before it had to occur, but before that event could occur the one before it had to occur and so on \emph{ad infinitum}. Since a beginningless God has no first moment, it follows that the event of creation couldn't occur. So, if a temporal God created the universe, then FEA would have to be an unsound argument.

But even if the third premise of FEA is false, such a temporal God could still not create the universe. Given the A-theory of time, there are two ways to conceive of time, that time is relative or that it’s absolute and a temporal God could not have created the universe under either of the two. Let's begin with absolute time. Absolute time is the view that time exists independently of everything, including the universe so even if the universe didn't exist absolute time would. Under such a view, time is universal, it's the same for everyone, and it is not relative to anything the way our watches are relative to the position of the Sun.

Under a past eternal absolute time, all moments of time prior to the universe are identical for without the universe there is no motion happening, and without some form of motion there is no change, and without change, there is nothing to differentiate one moment from the other. If all the moments of time are indistinguishable, then God could not have created the universe a finite

\(^{207}\) Ibid.
time ago, for he would have to choose an indifferentiable moment for creation instead of another indifferentiable moment. If God could choose such a moment, then that moment would not be indifferentiable for it would be defined as the moment God chooses to create. Even before that moment occurs it would still be defined as the moment that God will create the universe and that would differentiate it from all other moments and that, in turn, makes all moments differentiable for they can be differentiated relative to the moment that God chooses. But since the moment is indifferentiable given that there is no universe it follows that God could not have chosen it to create the universe. Thus, a temporal God could not create the universe if time is absolute.

Of course, one could say there was a motion of some sort before the universe, but this motion would have to be eternal, for if the motion had a beginning, then either it began uncaused or God created the motion. The latter option runs into the same problem as the one we are dealing with for we can ask the same question regarding motion, namely, how could God choose an indifferentiable moment to create motion? The former option is incompatible with God, for Craig states that God is the only thing that is uncaused208. This also makes eternal motion impossible for that would mean that the motion is uncaused or else it has an infinitely distant starting point which is impossible given the age-old rule that states an infinite cannot be traversed. One could also say that God himself is in a state of constant change, and such change makes moment differentiable, but this would make the third premise of KCA false for as we recall the premise stated that the cause of the universe has to be changeless. Moreover, Craig says that God is changeless209. Thus, a constantly changing God is not an option.

What about relative time? Could God have created the universe given such a view of time? Not at all. Relative time is the view that time is not independent of space, rather time and space are one thing, that one thing being spacetime. So, if time is past-eternal, that means that space has always existed. Since the universe is all of space and time that would mean the universe is past-eternal and thus beginningless given the impossibility of an infinitely distant starting point. If one does not take time to be past-eternal, then there would be no time without the universe, and we already saw that an atemporal God fails.

208 William Lane Craig, God over All: Divine Aseity and the Challenge of Platonism (New York: Oxford University Press, 2018), 81.
Since God could not have created the universe a finite time ago, could the universe have begun to exist uncaused a finite time ago? To begin to exist is a temporal event which requires time, this time would have to exist before the universe. Hence this would require absolute time. This time itself could not have begun to exist for that would require time so it would have to be beginningless. The universe could only begin to exist in such time if the third premise of FEA is false, since before the moment "the universe begins uncaused" could occur the one before it had to occur and so on ad infinitum. But even given the falsehood of the third premise, the universe could still not begin to exist uncaused. Without the universe, there would be no motion, and thus events in absolute time would be indifferentiable. If the universe could begin to exist in an indifferentiable event, then that event would not be indifferentiable. Thus, an uncaused beginning is not an option either. Of, course someone could posit that there was some form of motion existing before the universe in absolute time which would make the events differentiable. However, motion cannot happen in a vacuum; it would require some kind of space to take place in. If there is some space other than our universe in which our universe exists or is a part of, then we can just rename that space as the universe and take our universe to be a pocket universe in that space. We would then hold that universe to be beginningless.

This brings us to the last option, which is that the universe was caused by a cause that is neither God nor part of an infinite chain of causes and effect. Such a cause would have to be in time for it to cause the universe, that time would be absolute given that it is prior to the universe and that time would have to be beginningless for beginnings require time. The third premise of FEA would have to be false for the moment "the cause brings about the universe" could only occur if the event before it had occurred and so on ad Infinitum.

Given the unsoundness of FEA, do we get a universe with a beginning with such a cause? Not at all. Such a cause is either beginningless, or it has a beginning. If it is beginningless, then either it had to have caused the universe in indifferentiable time which is impossible, or there was motion in which case we would take the space in which the motion was occurring to be the beginningless universe. If the cause had a beginning, then either such cause was uncaused or had a cause. If it was uncaused, then we use the same argument we used for an uncaused cause of the universe, either it began in indifferentiable time, which is impossible, or there is a space which we dub the beginningless universe. If that cause has a cause, we ask the same question again, was its cause uncaused or did it have a cause? If we get another cause we rerun the argument.
again, given that the chain is not infinite we would eventually reach a stopping point and get either the impossibility of indifferentiable time or a space we can dub the beginningless universe.

So, the conclusion is reached, FEA is unsound, and its either the case that the universe is beginningless or KCA is rendered null. The chain of infinite causes and effects couldn't include God as a cause for each cause in the chain has a cause since an infinitely distant first cause would be impossible given the age-old rule. The cause in the chain that brings about the universe can't be atemporal and has to exist in absolute time, and absolute time is beginningless. Given beginningless time, the event "the last cause in the chain brings about the last effect which is the universe" could only occur if the event before it occurs and so on *ad infinitum*, and thus the third premise of FEA would have to be false.

Now, this infinite chain does not give us a beginningless universe. Even if it’s the case that some space has to exist for the universe to be caused, it does not follow that all the causes exist in the same space, it could be that each cause exists in its own space. Since there is an infinite number of spaces, there would be no space we can pick out and dub the beginningless universe. Thus, the conclusion we get is that either the universe is beginningless or it’s the last effect in an infinite chain of causes and effects.

This conclusion, however, can still be utilized in an argument for the negation of the second premise, for we can combine it with an uncontroversial principle. That principle is that we should not posit metaphysical explanations if we can give scientific explanations for something. I define metaphysical explanations as explanations that are neither scientific nor logically necessary. There are models of the universe that are past-eternal and thus beginningless. We will look at such models in the next section. Now there are no scientific models of a universe that is the product of an infinite chain of causes and effect, and such a chain is not logically necessary. So, given the uncontroversial principle and the fact that it is either the case that the universe is beginningless or the product of an infinite chain, it follows that we are justified in reject the chain and holding that the universe is beginningless. We can present our reasoning as the following argument:

1. The universe is either beginningless or the product of an infinite chain of causes and effects. (Premise 1)
2. We should not posit metaphysical explanations for something if we have scientific explanations for it. (Premise 2)
3. A beginningless universe is a scientific explanation while an infinite chain of causes and effect is a metaphysical explanation (Premise 3)
4. Therefore, the universe is beginningless. (Conclusion from premise 1, 2 and 3)

4.3.2 Craig’s second objection.

Another objection Craig gives is an argument from a thought experiment. Craig states that we can order the set of negative integers such that -1 is the last member, and he says that if the universe is beginningless, then we can put the events of such a universe in a one-to-one correspondence with the set of negative integers we just ordered, in which the present moment would correspond to -1. Craig asks us to imagine someone who has been counting one element in the set after each moment passes in a beginningless universe. If such a beginningless universe is possible, then we should find that person finishing the count at the present moment. Craig argues, however, that this is problematic. The reason is that in a beginningless universe an infinite amount of events has passed from every point in the past, this means that the person counting has had an infinite amount of time to count from each point in the past. So why is it that he is finishing at the present moment and not some other moment in the past, for from every moment in the past he has had sufficient time to finish the count. Given that it is inexplicable why he is finishing now and not any other moment in the past, it follows that the beginningless universe is absurd.

This argument is only successful if the Principle of Sufficient Reason (PSR) is true. PSR states that every true proposition or fact has an explanation for why it's true. Facts are taken to either be contingent or necessary. If they are contingent, then something external to themselves explains why they are true, and if they are necessary, then they explain themselves. So according to PSR, there is no such thing as brute facts that is a fact that has no explanation for why it is true.

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Morriston\textsuperscript{211} and Oppy\textsuperscript{212} have responded to Craig's argument by saying that it's just a brute fact that the person is finishing the count now as opposed to some other moment in the past. Oppy also challenges PSR with an argument known as the Big Conjunctive Contingent Fact (BCCF)\textsuperscript{213}. The argument is simple. We can take the conjunction of all contingent true proposition and call that conjunction proposition $P$. We can then ask whether the explanation for why $P$ is true is contingent or necessary. If the explanation is contingent, then it would be a proposition in $P$, which would mean that $P$ explains its own existence. But that would mean $P$ is necessary which is impossible for $P$ is a conjunction of all contingent proposition and thus it must be contingent. The explanation for why $P$ is true couldn't be necessary either. For if a necessary proposition explains the truth of another proposition, then it entails that proposition. But necessary propositions only entail necessary propositions while $P$ is contingent. Thus, given the fact that the explanation of $P$ can neither be contingent nor necessary it follows that PSR is false.

Craig replies to Oppy by saying that an argument can be given in defence of PSR, but he does not provide such an argument. So, we can overlook this part of the reply. Craig goes on to say that even if PSR is false, it's still the case that an explanation is required since the fact that the person has had sufficient time to finish the count from every point in the past makes it reasonable to ask why he completes the count just now\textsuperscript{214}. Craig's reply is problematic. If PSR is false, meaning that not all facts require explanation, then it follows that there are some brute facts. Since there are brute facts, we must ask by what criteria does Craig determine that a something requires an explanation? Why does the fact that the person has had sufficient time make it reasonable to ask for an explanation? What criteria makes the reason Craig gives sufficient for the requirement of an explanation? Craig needs to provide such criteria and the justification for the criteria to make such an assertion. The success of Craig's argument depends on such criteria and its justification. So, until Craig gives the criteria and its justification, the argument remains unsuccessful.

\textsuperscript{212} Graham Oppy, Philosophical Perspectives on Infinity (Cambridge: Cambridge University Press, 2006), 63.
\textsuperscript{213} Ibid, 280-1.
4.4 The Third argument: Argument from the Big Bang.

Before the 1920s, the scientific community was of the view that the universe is past-eternal and static. In 1917 Albert Einstein discovered that his General Theory of Relativity (GR) was not compatible with such a static universe because it showed that the universe was either expanding or collapsing. Instead of dismissing GR or the idea of a static universe, Einstein decided to keep both, and he was able to do so by introducing a cosmological constant into the equation\(^2\). The physicists Alexander Friedman and George Lemaître took the expansion suggested by GR seriously, and they predicted that our universe was expanding rather than being static. Their prediction was confirmed by the American astronomer Edwin Hubble; he showed that the light from distant galaxies is shifted towards the red end on the light spectrum, and this indicates that the galaxies are moving away from us, which in turn suggests that our universe is expanding\(^2\). The expansion indicated that our university started from an initial cosmological singularity, a state in which our universe was infinitely dense. For as the universe expands, it becomes less dense, if we were to reverse this process, it would become denser until it reaches a state of infinite density.

This gets us to Craig's first scientific argument for the second premise. Craig argues that such an expansion shows that the universe began to exist by expanding from a state of infinite density. Craig then asserts that infinite density is the same thing as nothing since according to him no object can have infinite density\(^2\). Now if an expansion from a state of infinite density is the same thing as beginning to exist out of nothing and we have scientific confirmation for such an expansion, then it's easy to see how Craig has a scientific case for the second premise. For if the universe began to exist out of nothing a finite time ago (the time it took the universe to

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217 Ibid.
expand to its current state from an infinitely dense state which is estimated to be 14 billion years), then it cannot be beginningless. We can formulate Craig’s scientific argument as:

1. The universe expanded from a state of infinite density a finite time ago. (Premise 1)
2. Expanding from a state of infinite density is the same as beginning to exist out of nothing. (Premise 2)
3. Therefore, the universe began to exist a finite time ago. (Conclusion from premise 1 and 2)

The first premise here is the theory that we just mentioned that was put forward by Friedman and Lemaitre. This theory became known as The Big Bang theory. We will come back to this theory later, for the time being, we can grant the premise. Since the argument is valid in form that leaves us with the second premise, which requires evaluation, so let us begin by examining Craig's case for it.

4.4.1 Craig’s case for the second premise.

Craig asserts that infinite density is synonymous with nothing and his justification is that no object can have infinite density\(^{219}\). Now some might get confused due to Craig's usage of the word *synonymous* because synonymity has to do with semantics and the two terms in question infinite density and nothing have different meanings. But Craig is not using the word *synonymous* in the colloquial sense, what Craig means by *synonymous* is that nothing and infinite density are ontologically equivalent. This clarification, however, leads to a new confusion, a confusion that is metaphysical rather than semantical. Nothing as Craig himself explains is the universal negation of everything and is not anything\(^{220}\), and if nothing is not anything, then it follows that nothing cannot be classified as a thing which means that nothing can't be

\(^{219}\)Ibid.

ontologically equivalent with a thing for ontologically equivalence means being the same thing as. So how can nothing be ontologically equivalent to a singularity that is infinitely dense which is a thing since it has the property of infinite density?

Craig answers by saying that the cosmological singularity is a theoretical fiction, it's nothing more than a mere mathematical idealisation, which is a sort of limit that the universe approaches as it keeps going back in time but never actually reaches. So, it’s a mathematical object with no metaphysical existence, and it can, therefore, be taken to be nothing in the sense that it has no metaphysical existence\(^\text{221}\). This requires justification for as Smith notes, the Big Bang theory is represented in cosmology as describing a real singularity with infinite density and not merely as something fictional\(^\text{222}\).

By rejecting the realness of the singularity, Craig has gone outside the fold of science and entered into the fold of philosophy. So, what is Craig's philosophical case for taking the singularity to be a fiction? Craig states that instants of time are nothing more than the boundaries of temporal intervals. Since instants are boundaries, it makes them contingent upon intervals. Now the Big Bang theory states that the initial cosmological singularity is spatially and temporally zero-dimensional, which means that it only exists for an instant, and this instant is the first instant of time. Since it's an instant that means it can have no independent existence for it is contingent upon an interval and given the A-theory of time that would mean that the singularity cannot exist at all. For according to the A-theory, only the present is real which would mean that there was a point in time in which the present was the singularity by itself without there being an interval; such a scenario is impossible because instants are contingent upon intervals. Thus, temporal becoming can only happen in intervals, and therefore, the singularity can't be real\(^\text{223}\).

Craig's states that instants are contingent upon intervals, but why could we not have phrased it conversely, namely that intervals are contingent on their boundaries such that intervals cannot exist without their boundaries? We could, and we would be correct in the case of closed intervals (intervals with a first and last instant). For closed intervals are only closed if they have


boundaries or else they would be open intervals (intervals with no first and last instants). So closed intervals and instants are co-contingent such that one cannot exist without the other.

So, what follows from this? A second argument for the negation of the second premise of KCA. The universe beginning to exist is an event and events are closed temporal intervals in the A-theory of time. For events are constantly occurring and they occur sequentially such that an event begins then ends and then the next event begins. So, events have both a first, and a last instant and Craig agrees with this analysis of events. If the singularity is an instant, and the singularity is not real, then it follows that the universe never had a first event. If the universe never had a first event, then it never began to exist, which means that the second premise of KCA false. It also means that the third premise of Craig's third argument is false, for the universe never began so it could not have begun out of nothing.

This argument that I just gave is inspired by a point Grünbaum made. Grünbaum states that there are two interpretations one can have of the Big Bang theory. He calls the first case (i) and the second case (ii). Case (i) take the singularity to be real, such that the universe has a first event and can be said to have begun. Case (ii) takes the singularity to be a mathematical fiction in the same way Craig is asserting that it is. Grünbaum points out that in case (ii) there would be no first event, the temporal past of the universe is unbounded such that it has no first interval. Grünbaum goes on to make the very same point we just made, which is that in an unbounded past time, the universe could not have begun to exist for there was no first event. Given the fact that closed intervals are such that intervals and their boundary points are co-contingent, it follows that case (i) is impossible if the A-theory of time is true. It would only be possible under the B-theory for then it would not be the case that only the present is real while the past and the future isn't, so it would not have been the case that the singularity would have been the only thing present without an interval existing. So, Craig must reject the second premise either way, he can either reject the A-theory and with it accept the nullification of the first premise of KCA and the falsehood of the second premise, or he can accept the A-theory and reject the second premise of KCA. We can formulate our argument as follows:

1. If the A-theory of time is true, then the singularity has no metaphysical existence. (Premise 1)
2. If the singularity has no metaphysical existence, then the universe never began to exist. (Premise 2)
3. The A-theory is true. (Premise 3)
4. The singularity has no metaphysical existence (Conclusion 1 from premise 1 and 3).
5. The universe never began to exist. (Conclusion 2 from conclusion 1 and premise 2)

So, if Craig wants to keep the two first premises of KCA, then he should be giving an argument in favour of the singularity being metaphysically real, not an argument for it being a mathematical fiction, but if he did that then he would have to reject the second premise of his third argument for the second premise. As for me, I see no option but to accept the fictional take on the singularity given the A-theory of time. And from that I see no option but to reject the second premise of KCA.

4.4.1.1 A possible objection: The Classical model is problematic

The argument we just gave against the second premise of KCA is an argument from the classical model of the Big Bang. Craig accepts this model of the Big Bang and uses it as the first premise in his third argument. This is problematic for Craig since this model in conjunction with the A-theory entails the negation of the second premise of KCA. Someone could, however, object to our argument by arguing that the classical model of the Big Bang is very problematic and thus, our argument relies on a problematic premise. Such a person would be correct regarding the model, for it does have problems. But this is not problematic at all for us, since in the solution to these problems, we get another argument that confutes the second premise of KCA. The solution gives us a new model of the Big Bang known as the Eternal Inflation Big Bang model. So, we will have an argument that confutes the second premise whether we choose to keep the problematic classical model or to adopt the Eternal Inflation model.
Let’s begin by looking at some of the problems that the classical model of the Big Bang faces. The Big Bang theory is the most accepted cosmological theory today. The reason for that is the fact that given the General Theory of Relativity (GR) the Big Bang theory is the only cosmological theory that is consistent with the expansion of the universe, the cosmic microwave background (CMB) which is the electromagnetic radiation that was left over from the early period of the expansion, and the abundances of light elements\(^\text{226}\). As impressive as that is, the classical model of the Big Bang has its problems. Let’s just mention two.

The first one is the magnetic monopoles problem. The classical model tells us that during the first yoctosecond (10\(^{-24}\) of a second) three of the four fundamental forces of nature, the electromagnetic force, the weak nuclear force and the strong nuclear force were combined as one force called the electronuclear force. During this same yoctosecond, the electronuclear force broke up into the three forces. The reason for this is that the three forces are unified at the temperature of 10\(^{27}\) Kelvin according to the Grand Unified Theory (GUT). This would have been the temperature at 10\(^{-34}\) seconds after the expansion. The electronuclear force would break up due to cooling down at around 10\(^{-32}\) seconds\(^\text{227}\). So why is this a problem? The breaking of the electronuclear force should have given rise to particles called magnetic monopoles which are magnets with only one pole, and these magnets should be found everywhere, yet they have never been found\(^\text{228}\).

The second problem is the flatness problem. Our universe is flat, a state that should almost certainly not be the case given the classical model. Instead, the universe should be either positively or negatively curved. The possibility of it being flat given the classical model is near impossible for it would mean that within 10\(^{-43}\) seconds after the expansion the density of the universe would have been extraordinarily close (less than 10\(^{-62}\) in difference) to the critical value (minimum density required to stop the expansion of the universe). There is no reason why it should have been that close, and so it would have been due to mere chance\(^\text{229,230}\). What this

\(^\text{226}\) Ethan Siegel, Beyond the Galaxy: How Humanity Looked beyond Our Milky Way and Discovered the Entire Universe (Hackensack, NJ: World Scientific, 2016), 204.
\(^\text{229}\) Ibid.
means is that the classical model posits that an extremely improbable scenario occurred, and it offers no explanation for it.

The American theoretical physicists Alan Guth solved these two problems amongst others with the Inflation theory. The Inflation theory states that the expansion of the universe accelerated exponentially for a period that lasted from $10^{-36}$ seconds after the expansion to $10^{-33}$ seconds. During this period the universe became $10^{26}$ times larger. This gets rid of the flatness problem because such an inflation would have flattened out the early universe or to put it differently the inflation would have forced the actual density towards that of the critical value. The inflation would thus explain why the universe is flat. Moreover, such an inflation would have reduced the detectability level of the monopoles to such a degree that they would be unobservable.

So as Chris Smeenk points out, our observations given the classical model are extremely improbable, but if we combine the classical model with Inflation theory, we will observe exactly what is expected to be observed. Today the Inflation theory which Guth developed in 1979 is so widely accepted amongst physicists and cosmologists that it is taken as an established truth by the scientific community. The fact that it explains away the problems that affected the classical model is not the only reason why the Inflation theory is so widely accepted. Another reason is that it has made successful predictions. According to the Inflation theory, the inflation that flattened out the universe did not do so perfectly. This is because of fluctuations caused by the laws of QM. These fluctuations lead to inflation ending at different times in different regions of space, and this caused these regions to differ slightly in temperature. Besides predicting these variations, the theory also predicts that these variations are independent of the size of the region, such that if it was possible to increase or decrease the sizes of the regions they

fall under they would still have the same magnitude, in other words, they are scale-invariant. These predictions were made in the early 1980s, and they were later confirmed to an astonishing degree by observations. Measurements of the CMB show that there are variations and that these variations are scale-invariant just as the Inflation predicts.\(^{237}\)

But there is something that needs to be mentioned. Inflation introduces a new problem, similar to the flatness problem that the classical model faced, which is that the Inflation model posits that an extremely unlikely scenario occurred. Paul Steinhardt, who is one of the earliest physicists to propose the Inflation theory, explains that there is such a thing as good inflation and there is such a thing as bad inflation. Only good inflation would have led to the outcome we observe today in the universe. The force that drove the inflation is a relative of the magnetic field called Inflaton. Whether the inflation would end up being good or not depends on the amount of energy (called potential energy) the Inflaton has. Only an extremely narrow range of the value determining the potential energy would have led to good inflation. In fact, to say that it’s extremely narrow is an understatement, the value can take on any number, but to get good inflation, the value has to be near \(10^{-15}\), just an infinitesimal difference like the value being \(10^{-12}\) would have led to bad inflation.\(^{238}\)

The problem does not end there. It’s not only the case that bad inflation is immensely more likely than good inflation. No inflation taking place is a scenario that is more likely than good inflation. The mathematical physicist Sir Roger Penrose demonstrates that the unlikely situation of obtaining a flat universe without inflation in the classical model is immensely more likely than good inflation, more likely by a factor of \(10^{\text{googol}}\) (googol is \(10^{100}\) or in other words 1 followed by 100 zeros). So, the inflation theory ended up solving the unlikely scenario problem facing the classical model by positing an even more unlikely scenario.\(^{239}\)

The solution to this problem facing the Inflation theory is the Eternal Inflation theory. Instead of lasting for the segment of a second, the inflation is eternal. Given such an eternal inflation we would be living in a multiverse, that is a universe made up of pocket universes, our universe would be one of them. The pocket universes would be produced by Big Bang events caused by inflation, and these pocket universes would be infinite in number. These pocket

\(^{238}\) Ibid, 39-41,
\(^{239}\) Ibid, 41.
universes could then be collected into an actual infinite set, and the set of improbable universes like ours would be a proper subset of such a set. The proper subset would itself be an actual infinite. The very low probability of our universe would no longer be a problem for the existence of our improbable universe would be necessary just as the existence of infinite other improbable universes would be necessary\textsuperscript{240}. As Guth explains, in the case of an eternally inflating multiverse, anything that can occur will necessary occur, and it will necessarily occur an infinite number of times\textsuperscript{241}.

How could such an eternal inflation occur? It is a result of QM. The fluctuations mentioned above that are caused by the laws of QM are of such a large size in some regions of space that they will create inflating regions which will continue to grow. These regions grow exponentially and render the region in which inflation ended insignificant in size, we would have a tiny pocket universe surrendered by a space of inflating regions, each inflating region creating more inflating regions and pocket universes, and this process goes on eternally never stopping\textsuperscript{242}.

Given the A-theory of time, eternal inflation would have to be beginningless and not just never-ending in the future direction, and since inflation requires a universe to occur in that universe must also be beginningless. For to have an infinite number of pocket universes produced by inflation as the Eternal Inflation theory posits such inflation can't have a starting point since an infinite cannot be traversed. So, an infinite number of pocket universes can only be produced by a beginningless inflation and this requires a beginningless universe. Steinhardt states that eternity is a natural consequence of inflation such that you can’t have inflation without eternal inflation\textsuperscript{243}. So, given the A-theory inflation requires a beginningless universe, we take the universe here to be the multiverse made up of pocket universes. Now since the Big Bang theory requires inflation to get rid of the problems faced by the classical model and inflation can only be eternal and given the eternalness of inflation the universe must be beginningless, it follows that the new model of the Big Bang posits a beginningless universe. Thus, the Eternal Inflation Big Bang model renders the second premise of KCA false. We can present this argument as follows:

\textsuperscript{240} Ibid, 42. 
\textsuperscript{243} Ibid.
1. The Big Bang theory requires inflation. (Premise 1)
2. If there is inflation, then that inflation is eternal. (Premise 2)
3. Eternal inflation requires a beginningless universe. (Premise 3).
4. Therefore, inflation requires a beginningless universe. (Conclusion 1 from premise 2 and 3).
5. Therefore, the Big Bang theory requires a beginningless universe. (Conclusion 2 from conclusion 1 and premise 1).

This argument is valid, and we have seen that the first premise is true, for as we recall the classical model without inflation faces several problems, two of them we presented above, and these problems require inflation to be solved. We also saw that the third premise is true, for eternal inflation produces an infinite number of universes, and that could only be the case if inflation is beginningless. Since inflation requires a universe to occur in, it follows that the universe in which inflation occurs must be beginningless. That leaves us with the second premise, which is Steinhardt’s assertion. What reasons besides his words do we have for accepting that the second premise is true or at least more plausible than its negation? We have empirical evidence collected over the last two decades. Observational data collected on the CMB by Wilkinson Microwave Anisotropy Probe, Planck space observatory and Atacama Cosmology Telescope disfavours the classical non-eternal inflation models and favours inflation models that can't avoid eternal inflation244.

So, we have good reasons given empirical data to take the third premise to be true, or at the very least more plausible than its negation. Since the two other premises are true, and the argument is valid, it follows that the Big Bang theory requires a beginningless universe. Thus, given the A-theory of time, we can give someone who like Craig accepts the classical model the argument from that model which concludes with the universe being beginningless. If someone rejects our argument due to the classical model being problematic, then we can give him the argument from the Eternal Inflation Big Bang model which concludes with the same thing.

Either way, the second premise is false. If someone chooses to accept neither of the argument because they adhere to the B-theory of time, then that's fine too for they would have to accept that the second premise is false either way given the B-theory. The second premise is false, no matter what. Before moving on to Craig fourth argument for the second premise, let us consider three objections that can be raised against the argument from the Eternal Inflation Big Bang model.

4.4.1.1 Craig’s first possible objection: The Boltzmann brain problem.

Craig could object as he has done in the past against multiverse theories. Craig could argue that the Eternal Inflation Big Bang model ought to be rejected because it leads to a multiverse, which is absurd. The reason a multiverse is absurd is because of the Boltzmann brain problem. The Boltzmann brain problem is the problem that it is far more likely that a single brain would be created in the multiverse than a universe like ours. So, it is far more likely that you are a brain (named a Boltzmann brain after the Austrian physicists Ludwig Boltzmann) under the illusion that you are living in a universe with other minds around you than that you are actually living in a universe with other minds. So, if you do believe in the multiverse, then you ought to believe that you are a Boltzmann brain because that is the most rational belief to hold since such a situation is much more probable than one in which you are an embodied mind in a universe with other embodied minds. Since no sane person would believe they are a Boltzmann brain, therefore, no sane person should believe the multiverse245, and thus, no sane person should believe in the Eternal Inflation Big Bang model.

Does the Boltzmann problem give us a reason to reject eternal inflation? Not at all. The Boltzmann problem only affects a multiverse with a finite number of pocket universes, not the type of multiverse that exists given eternal inflation which, according to Guth, is one of an infinite number of pocket universes246. Why does an infinite multiverse avoid the problem? Because anything that is possible happens and not just once but an infinite number of times as Guth explained. So, the multiverse will have an infinite number of Boltzmann brains and an

infinite number of universes like ours in which there are other minds. This as Guth explains renders probability meaningless for probability is the measure of the likelihood of some phenomena occurring calculated by dividing the number of ways it can happen with the total number of possible outcomes\(^{247}\). So, under eternal inflation, you would have infinity (the number of universes like ours or the number of Boltzmann brains) divided by infinity (number of outcomes) which is meaningless because division like subtraction is undefined for the infinite because like subtraction if you try to divide using infinity you will end up with contradictions. So, given an infinite multiverse one couldn't assert that it is more probable that we are a Boltzmann brain since probability is rendered meaningless and so Craig can’t assert that one ought to believe one is a Boltzmann brain if one believes in the infinite multiverse.

4.4.1.1.2 Craig’s second possible objection: Past-eternity.

Another objection that Craig can give is that the Eternal Inflation Big Bang model only states that inflation is future eternal and not that it is past-eternal. Guth himself states that eternal inflation only implies that once inflation starts, it will continue eternally into the future\(^{248}\). Guth goes on to say that the question of whether inflation is past-eternal or not is an open question and that he personally leans towards it being finite to the past and only infinite in the future direction. Without inflation being past-eternal\(^{249}\), we cannot conclude that the Big Bang theory supports a beginningless universe because a universe with a beginning is compatible with a future-eternal only inflation model.

This objection however fails. For given the A-theory of time, a future-eternal only model is impossible. For as Guth states, eternal inflation leads to an infinite number of pocket universes\(^{250}\), and it is for this reason that Guth states that probability is meaningless given eternal inflation\(^{251}\). Given the fact that temporal becoming is real as the A-theory states the creation of an infinite number of universes would be impossible. For if inflation has a starting point, then the

\(^{247}\) Ibid, 11.
\(^{249}\) Ibid.
\(^{251}\) Ibid, 11.
collection produced will only be potentially infinite, meaning that the number of universes will continue growing towards infinity but never reaching it. Thus, the collection will at all times be finite. It is only in the B-theory of time that we can have an infinite number of pocket universes with a finite past, for the pocket universes would not have been created by a process that requires traversing an infinite since there is no such thing as a creating event.

Somebody could state that given the A-theory of time we could accept that there is only a finite number of pocket universes at all times and thus we can still accept both eternal inflation and a multiverse with a beginning. This reply would fail too, for it would entail that it's more likely that we are Boltzmann brains than actual embodied minds in a universe with other embodied minds. For if there is only a finite number of pocket universes, then probability will be meaningful. There will be a finite number of pocket universes like ours, a finite number of Boltzmann brains and a finite number of total things produced by inflation. The number in the numerator (number of pocket universes like ours or Boltzmann brains) and the number in the denominator (total number of things produced) will both be finite. Since more Boltzmann brains are produced, the quotient obtained by having the number of Boltzmann brains in the numerator will be greater than the quotient obtained by having the number of the pocket universe like ours. What follows is that Boltzmann brains will be more probable and that we should, therefore, believe that we are Boltzmann brains if we want to be rational. Since such a scenario is absurd and yet entailed by a future-eternal only inflation model, it follows that a future-only eternal inflation model is absurd.

4.4.1.3 Craig’s third possible objection: BGV.

Another objection Craig could give is one that he has given before against past-eternal inflation models. This objection is one that Guth has also made. Guth gave two reasons for why he is more sympathetic to a finite past eternal inflation model. The first reason is that no beginningless eternal inflation model has been constructed and the second is the Borde-Guth-Vilenkin theorem (BGV) which shows that under fairly plausible assumptions eternally inflating
models are bound to the past, and thus they require a beginning\textsuperscript{252,253}. It's the second reason that Craig presents against past-eternal inflation models\textsuperscript{254}.

This objection fails. As Sean Carroll points out, BGV assumes classical mechanics while the universe is governed by QM and so all BGV shows is that classical descriptions of physics break down at some point in the past in eternally inflating models, this does not mean that the universe has a beginning. All this means is that classical mechanics fails to give a complete description of the universe. A theorem that assumes QM instead of classical mechanics called the Quantum Eternity Theorem shows that under fairly plausible assumptions the universe comes out as necessarily past-eternal\textsuperscript{255}.

As for Guth's first reason for why he is more sympathetic to a finite past eternal inflation model, which is that no beginningless model has been constructed, this should not worry us at all. Guth made this remark back in 2001, and a couple of years later, past-eternal inflations models were developed, such as the Carroll-Chen model\textsuperscript{256} and the Aguirre-Gratton model\textsuperscript{257}.

4.4.1.1.4 Another possible objection: The Big Bang theory.

There is another objection that can be made against our argument, one that Craig himself would not make (for he accepts the Big Bang theory) but which we nevertheless should address to make the justification for our argument as broad as possible. Somebody could point out that our argument only concludes that the Big Bang theory in conjunction with the A-theory of time entails that the universe is beginningless and not that the universe is, in fact, beginningless given the A-theory. So, they could say that we have a burden to prove that the Big Bang theory is true or at the very least more plausible than its negation.

\textsuperscript{252} Ibid, 14.
We stated earlier that the Big Bang theory is the most accepted theory of the universe. However, to argue that its true from this would be fallacious, for it would be a case of appealing to the majority. Something is not true because most people believe that it's true. But we can argue from the reasons for why it is the most accepted. We recall that The Big Bang theory is the only theory given GR that can account for the expansion of the universe, the CMB and the abundances of light elements. The fact that the Big Bang theory is the only theory that can account for all of these observed facts does not entail that it's true, but it gives us a reason to think that it's true, and this reason at least makes the theory more plausible than its negation.

4.5 The Fourth argument: Argument from the second law of thermodynamics.

When energy is used, its state changes, from usable to unusable energy. The measure of unusable energy is called entropy. The second law of thermodynamics states that in a closed system, that is a system in which energy does not enter or exit, entropy will always increase. Entropy keeps increasing until a state called thermodynamic equilibrium is reached. All the usable energy will have been converted into unusable energy when the system is in equilibrium. Craig's fourth and last argument for the second premise of KCA is one from the second law of thermodynamics. Craig argues that the law proves the universe had a beginning. He argues that the universe is a gigantic closed system, and since all closed systems eventually reach thermodynamic equilibrium, our universe will also reach such a state once enough time passes. But if the universe has always existed, meaning an infinite amount of time has passed, then the universe should already have reached such a state. Since our universe is not in equilibrium, since we observable energy constantly being used around us, that means it has not always existed, which in turn means that the universe has a beginning. Craig’s argument can be presented as:

1. If a closed system is past-eternal, then that system should be in thermodynamic equilibrium. (Premise 1)

2. The universe is a closed system. (Premise 2)
3. The universe is not in a state of thermodynamic equilibrium (Premise 3)
4. Therefore, the universe should be in thermodynamic equilibrium if it's past-eternal. (Conclusion 1 from premise 1 and 2)
5. Therefore, the universe is not past-eternal. (Conclusion 2 from conclusion 1 and premise 3).

This argument is valid. The third premise is demonstrably true; we observe energy being used all the time when you get up of your bed in the morning you are using energy. The second premise simply states that there is nothing outside the universe that transfers energy to the universe, a claim I find uncontroversial and grant. The premises in question is the first one. This premise assumes that the second law of thermodynamics applies everywhere in the universe, or in other words, that it's universal.

Now we know that the second law of thermodynamics applies to our local region of the universe, meaning the part of the universe we can see, but whether it applies everywhere in the universe I was unsure, but I suspected that this was not known. I emailed Carroll to ask whether that was the case and got the following reply:

The Second Law definitely comes about because of the configuration of matter in our local region of the universe -- in particular, because the entropy was very low near the Big Bang. That doesn't necessarily mean that it's not universal -- by "local region" we mean the part of the universe we can see, and by definition we can't see what things are like elsewhere. The 2nd Law might apply everywhere in the real universe, or it might not. The idea that the 2nd Law implies the universe began to exist is obviously wrong. It assumes that the 2nd Law is universal, which it might not be. (emphasis mine).

So, the second law could be universal, or it could only apply locally. Thus, it's possible that a past-eternal closed system universe is not in a state of thermodynamic equilibrium and until Craig gives us a reason to believe that the law is universal his inference from it to the universe's beginning remains unjustified, or in other words, the first premise of the fourth argument remains unjustified.

259 Sean Carroll, "Re: Urgent," e-mail to Younes Terrab, July 30, 2018.
4.5.1 A possible objection from Craig: Inductive generalization.

In 3.1.1.1 above, we mentioned that there is a principle used in physics, which states that we ought to apply physical laws as much as possible. Craig could argue that even though we don't know if the second law of thermodynamics is universal, we should still apply it universally given this principle. This objection would fail. For the principle states that we should apply physical laws as widely as possible provided that we don't have a reason for why we shouldn't do so. But, in this case, we have reasons for why we shouldn't. For the best theory of the universe is the Big Bang theory, which requires eternal inflation in order to get rid of the problems that the classical model of it faced. And given the A-theory of time, eternal inflation implies a beginningless universe, which is only possible if the second law of thermodynamics isn't universal. Thus, the Big Bang and the A-theory of time which we assume is true give us a reason for why we shouldn't universalise the second law of thermodynamics.

4.6 The case against the second premise.

As we have seen Craig's four arguments for the second premise fail, so we have no reason for why we should take the second premise as more plausible than its negation given the A-theory of time. We have also seen that we have three sound arguments for why its negation is more plausible given the A-theory. The first is that the universe must be beginningless if it exists, provided we go with the principle that we should not posit metaphysical explanations if we have scientific ones. The second and third arguments were from the Big Bang theory, the first from the classical model and the second from the model that results from fixing the problems that the classical model faces. So, someone will have a sound argument for why the universe has to be beginningless whether she decides to stick with the classical or whether she chooses to dismiss the classical model due to the problems it faces and instead go with the model that results from the solution to these problems. Since the second premise is less plausible than its negation, it follows that KCA is not a good argument according to Craig's standards.
Chapter 5: The Third premise

As we just saw, KCA is a bad argument, bad according to Craig’s own criterion. The reason is that the two first premises of the argument are not more plausible than their negations, the first is equiprobable given the evidence and the second is less plausible. So, we have successfully done what the New Atheist failed to do according to Craig, and that is to successfully engage the best argument for God's existence and show that it fails. We can, however, take an additional step and show that even if the standard version of KCA is successful, it would still be an unsuccessful argument for God's existence. The reason is that the standard version wouldn’t prove that God exists. Rather all it would prove is that the universe has a cause.

Craig asserts that if the universe has a cause, then that cause must be God, and this assertion is the third premise of the extended version of KCA, which we have been referring to as simply KCA. This assertion is unjustified as we will see. But before we get to that let us first go through Craig’s case for this premise. Craig's case is a set of four arguments, three for the cause being personal and one for the cause being uncaused, beginningless, changeless, immaterial, atemporal (without the universe), singular and immensely powerful. Craig states that a cause that has these attributes can only be an unembodied mind, and he states further that an unembodied mind with these properties is exactly what the Christians call God. Craig has not given these argument names, but I've named them the following: (1) The Attribute Argument (2) The First Personal Cause Argument. (3) The Second Personal Cause Argument, and (4) The Unembodied Mind Argument. Craig presents all of these arguments in his paper The Kalam Cosmological Argument which he published in 2009 in the anthology The Blackwell Companion to Natural Theology. The First Personal Cause Argument is also found in Craig's first book, The Kalam Cosmological Argument (1979). Let's examine these arguments.

5.1 The Attribute Argument.

Let's begin with The Attribute Argument (AA). Craig argues that if the universe is caused, then that cause must be uncaused, beginningless, changeless, immaterial, timeless,

spaceless, singular and enormously powerful. Craig argues that the cause must be uncaused because an infinite regress of causes can't exist because an actual infinite is impossible, and thus, there must be a first cause that is itself uncaused. It could be the case that there are intermediate causes between the first uncaused cause and the immediate cause of the universe, but this can be ignored, and one can take the first cause and the cause of the universe to be the same. The reason is that even if there are intermediate causes, the ultimate cause of the universe would still be the first cause which puts the chain of causes into action.\(^\text{261}\)

Next Craig uses Occam’s razor (OR) to argue that the first cause is a singular one as opposed to a plurality.\(^\text{262}\) OR states that when choosing between different options given no evidence, we should go with the option that makes the fewest assumptions since that’s the option that is the least likely to be wrong. After all the more claims made, the greater the chance one could be wrong. For example, if I am asked to guess what is in an opaque box, I would have a greater chance of being right if I just guess cat than if I guess a white female Maine Coon. Since with the latter guess, I could still be wrong if it turns out to be a cat, for it must be a specific type of a cat.

Craig further argues that the cause must be beginningless because it's uncaused. Craig states that the cause must also be atemporal without the universe because it created time when it created the universe. Since the cause is atemporal, it must also be changeless for if there is change, then there is time. And if the cause is changeless, then it must be immaterial for any material object is constantly changing because material objects consist of atoms and atoms are constantly changing. Furthermore, that the cause must be spaceless for its immaterial and atemporal, and no spatial entity can be both atemporal and immaterial. Since this caused created the universe, it must be enormously powerful.\(^\text{263}\)

This argument fails for it depends on the success of the first argument for the second premise, the argument against the possibility of an actual infinite. Craig gets that the cause must be uncaused from the impossibility of an actual infinite and he gets beginninglessness from uncausedness. From beginninglessness, he gets atemporality, and from atemporality, he gets changelessness. From changelessness, he gets immateriality and from immateriality along with


\(^{262}\text{Ibid.}\)

\(^{263}\text{Ibid.}\)
atemporality he gets spacelessness. The argument against the possibility of an actual infinite failed as we saw above so Craig's assertion that an infinite regress of causes is impossible is unjustified, which means that his assertion that the cause must be uncaused is unjustified. Thus, Craig has no case for why the cause must be uncaused, beginningless, atemporal, changeless and immaterial.

Just because we granted the two first premises of KCA does not mean we grant Craig's argument against the possibility of an actual infinite. This goes to show that the impossibility of an actual infinite is not only important for the second premise of KCA but also for the third premise. Thus, AA fails since the argument against the possibility of an actual infinite fails.

### 5.2 The First Personal Cause Argument.

The First Personal Cause Argument is a disjunctive argument, a type of argument that gives two options that are mutually exclusive and jointly exhaustive, then eliminates one of the options which makes it necessary that the remaining option is true. The argument can be presented as:

1. The universe was brought into being either by a mechanically operating set of necessary and sufficient causal conditions or by a personal, free agent. (Premise 1)
2. The universe could not have been brought into being by a mechanically operating set of necessary and sufficient causal conditions. (Premise 2)
3. Therefore, the universe was caused by a personal, free agent. (Conclusion from premise 1 and 2). 264

This argument is valid in form, so its success depends on the two premises. So, are the two premises more plausible than their negations? No, they are not. The first premise is false, and the second premise is unjustified. The first premise is false because it’s a false dilemma meaning that the two options given in the premise are not jointly exhaustive; they could both be

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false while a third option could be true. But before we discuss what the third option is, let's first examine Craig's case for the second premise.

5.2.1 The First Personal Cause Argument: The second premise.

Let's first explain the terms used in the argument. We already explained in 3.1 the difference between necessary causal conditions and sufficient causal conditions. A personal, free agent or simply a personal cause is a person who can produce his effect at any time he pleases, for example, me sitting on a chair, I am a personal cause, and I can produce the effect of standing up anytime I please. God creating the universe is another example of a personal cause. The existence of a personal cause is a necessary causal condition for its effect, but it's not sufficient. For example, it does not follow that I will stand up from my chair from the fact that I exist for it could be the case that I decide to never stand up, but I couldn't choose to stand up at all if I didn't exist. A Mechanically operating set of necessary and sufficient causal conditions or simply a mechanical cause is a non-personal cause and can be described as a state of affairs that guarantees its effects. An example of a mechanical cause is temperature hitting below zero degree Celsius, which is the cause of water freezing. Craig states that a mechanical cause must produce its effect immediately since it's sufficient, and sufficient causes can at no time exist without their effects\(^{265}\).

Craig argues that a mechanical cause can't be the cause of the universe for there can be no time at which a mechanical cause exists, and its effect doesn't. The cause of the universe is beginningless, so if a mechanical cause caused the universe, then the universe has to be beginningless as well. But the universe had a beginning as the second premise of KCA establishes so it follows that the mechanical cause must have a beginning, but since the cause of the universe is beginningless, this is impossible. Therefore, a mechanical cause could not have caused the universe\(^{266}\).

This argument fails for it depends on the success of AA, which we just saw failed. Therefore, Craig has no justification in asserting that the cause of the universe must be


\(^{266}\) Ibid.
beginningless. Since AA fails, we have no reason why we should take the second premise of the First Personal Cause Argument to be more plausible than its negation.

5.2.2 The First Personal Cause Argument: The first premise.

The first premise is false because it's a false dilemma since there is another option besides personal cause and mechanical cause, namely, a non-personal indeterministic cause. An indeterministic cause is a cause that is necessary for its effect but not sufficient, and yet it's non-personal. Craig objects that the first premise would only be a false dilemma if a non-personal indeterministic cause were indeed another option besides personal cause and mechanical cause. He argues that it's not and so the first premise is a true dilemma.267

Why couldn't the cause of the universe be a non-personal indeterministic cause? Craig answers that AA establishes the following attributes for the cause of the universe: uncaused, singular, changeless, beginningless, atemporal, immaterial, spaceless and enormously powerful. Craig then asks what this cause could possibly be other than a personal cause. Craig states that if someone wants to suggest a non-personal cause that is indeterministic and has these attributes, then one has to explain what this thing is for it to be taken as a serious rival to the personal cause explanation. To merely state that such a cause is indeterministic and non-personal with these attributes is no explanation at all; rather, it is just a repetition of the explanandum (the thing that we seek to explain). Craig argues that we can dismiss the possibility of an indeterministic non-personal cause since no explanans (the explanation of the explanandum) has ever been offered.268

Craig reasoning here is strange since he takes a mechanical cause to be a legitimate option which he deals with and tries to eliminate even though no suggestion has been given for a mechanical cause that is uncaused, atemporal, beginningless, changeless, immaterial, spaceless and immensely powerful. Craig gives no justification for why he includes a mechanical cause but not an indeterministic cause as an option in the first premise. So, if a mechanical cause is legitimate, then so is an indeterministic cause and thus the first premise remains a false dilemma.

268 Ibid.
The problem with the first premise could easily be remedied; all Craig has to do is to make it trilemma instead of a dilemma by including an indeterministic cause and modify the second premise to state that the cause can neither be mechanical nor indeterministic. The argument would still fail because of the second premise.

5.3 The Second Personal Cause Argument

The Second Personal Cause Argument is another disjunctive argument. Craig argues that there are two types of explanations, scientific ones, and personal ones. Scientific explanations explain events in terms of scientific laws and theories. For example, if I find a kettle boiling in the kitchen I could ask my mother why it's boiling, and she could explain to me that the copper bottom of the kettle is being heated by a flame, the heat from the flame increases the kinetic energy of the H2O molecules and causes them to vibrate in a violent manner which leads them to break the tension of the water and fly out in the form of steam, the steam that I observe. This would be a scientific explanation. Personal explanations, on the other hand, explain things in terms of the volition of agents, so a personal explanation for why the kettle is boiling would be because my mother desired to drink tea, so she put the kettle on the stove.269

Craig states that the explanation of the cause of the universe could not be a scientific explanation since there were no scientific laws before the universe existed and therefore it follows that the explanation of the cause of the universe must be a personal explanation.270 This argument is fallacious for it's another false dilemma. There is a third option, but before we present the option, we need to quickly explain what the problem of demarcation is since Craig is using the word scientific.

The task of distinguishing scientific explanations from non-scientific explanations is known as the demarcation problem and was a topic that was debated by philosophers of science of the last century. The famous German philosopher of science Karl Popper suggested that we can demarcate scientific explanations from non-scientific ones by a falsifiability criterion. He called the non-scientific ones for metaphysical explanations. If an explanation or theory is

270 Ibid.
falsifiable, then it can be deemed to be a scientific one, if not, then it can be deemed to be a metaphysical one. We can use Popper's criterion to explain why Craig's argument fails. There is no reason why the explanation of the cause of the universe couldn't be unfalsifiable and yet non-personal. An example of such an explanation is that the universe was caused by a mechanical cause that is part of an infinite chain of causes and effects. This explanation is unfalsifiable thus metaphysical, but it's non-personal. So, there is a third option besides scientific explanations and personal explanations. Metaphysical explanations show that the two-options Craig suggested are not jointly exhaustive and so his argument is based on a false dilemma and therefore fails.

5.4 The Unembodied Mind Argument.

The Unembodied Mind Argument is yet another disjunctive argument. Craig argues that only unembodied minds or abstract objects like numbers can have the following attributes: uncaused, changeless, beginningless, atemporal, immaterial and spaceless. Since abstract objects don't have causal powers, that is they cannot cause anything to begin to exist, so it follows that the cause of the universe must be an unembodied mind. Minds are personal, so the cause of the universe must be personal. This argument too depends on AA, which failed and thus this argument fails as well.

5.5 The case against the third premise.

All of Craig’s argument for the third premise fail. So even if we grant Craig the conclusion of the standard version of KCA, it would still not be the case that he has a good argument for God’s existence. The reason is that Craig has not given us any reason why the cause must be God as he alleges in the third premise. Since it can be the case that the universe has a cause and yet that cause is not God it follows that the third premise is false.

Conclusion.

There is no doubt that the question regarding God's existence is one of the most important questions that can be asked; perhaps one can even make the case that it's the most important one. Natural theologians, like Craig, believe that several good arguments can be made for a positive answer to this question. While it's true that the New Atheists have not seriously engaged the arguments for God as Craig states, we have seen in this paper that one can successfully engage KCA which is the argument that Craig seems to take as the best one for God's existence. Craig takes a good argument to be one that is not only valid in form but also one whose premises are more plausible than their negations. We have seen that this is not the case for KCA, for not only do all of Craig's arguments for the premises fail but good arguments can be presented for why the premises are not more plausible than their negations, and we have presented such arguments in this paper.

The first premise was the principle CP, which states that everything that begins to exist must have a cause, and we saw that CP must be qualified such that cause only refers to necessary causal conditions. This qualification is needed for the premise not to be falsified by observations made on the atomic level. Such a qualification leads to the failure of Craig's first argument, which is the empirical argument. For the qualification makes CP unfalsifiable, and our observations only verify a more modest version of CP (MCP) and this version does not make CP more plausible than its negation. MCP proved to be problematic for Craig's second argument, which was Edwards' argument for all-encompassing causality. This is because it's false that we should expect to observe millions of things coming into existence uncaused given the falsehood of CP since the truth of MCP makes it such that we should not be expected to see millions of things coming into existence uncaused. The third argument Craig gave failed since the principle \textit{ex nihilo nihil fit} which entails CP does not fit the description of a simple truth and neither an appeal to philosophical intuition nor cognitive intuition saves the argument. The last argument, which was a Kantian argument for CP being synthetic \textit{a priori} failed since it does not follow that a proposition is true of the world from it being necessary for intelligibility. Since all of these
arguments fail and we don't have an argument for the negation of CP, it follows that CP is equiprobable with its negation given the principle insufficient reason.

The second premise was that the universe began to exist, and for this premise, Craig gave two philosophical arguments that go back to Philoponus and the *Mutakalimun* and two scientific arguments. The first philosophical argument failed because not only is its first premise unjustified given set theory, but the argument is invalid given an anti-Platonist view and the A-theory of time. The A-theory of time also proved to be problematic for Craig's two scientific arguments. It was problematic for the first since the theory the argument is based on which is the Big Bang theory entails a beginningless universe if we take the theory in conjunction with the A-theory of time. The A-theory was problematic for the second argument since we can't universalise the second law of thermodynamics because the A-theory gives us a reason not to that reason being that the best theory of the universe entails that the universe is beginningless. The second philosophical argument failed because it was based on an incorrect analysis of a beginningless universe. While all of these arguments for the second premise fail, we saw that we have three good arguments that support the negation of the premise. The first argument was that under the A-theory of time the universe could only exist if it’s beginningless provided that we operate with the rule which states that we should not posit metaphysical explanations if we have scientific ones. The second and the third argument were based on the same theory that Craig appeals to in his third argument which is the Big Bang theory, given this theory and the A-theory of time the universe has to be beginningless.

The third premise was that if the universe had a cause, then that cause must have a set attributes which only God can have. Craig gave four arguments for this premise. Three of these arguments depend on the success of the first philosophical argument for the second premise, and this argument is invalid. Thus, all three arguments fail. The argument which does not depend on this invalid argument turned out to be fallacious for it was based on a false dilemma since scientific explanations and personal explanations are not the only type of explanations for we also have metaphysical explanations. The third premise was false for it can be the case that the universe has a cause without that cause being God.

At the beginning of the paper, I stated that I sought to contribute to the debate around KCA by giving new arguments against it and against Craig's case for it. I fulfilled the first part of this task by giving three new arguments against the second premise of KCA, and I fulfilled the
second part of the task by giving the argument that the first philosophical argument for the second premise is invalid given an anti-Platonist view and the A-theory of time. I also said at the beginning that I seek to address two of Craig's rebuttals that have remained unaddressed. A rebuttal that was completely unaddressed is Craig's reply to Morriston, which was that a philosopher is not obliged to give a psychological account of why other philosophers disagree with him. I addressed this by pointing out that if Craig is talking about a philosophical intuition, then he has a burden upon him to prove that there is such an intuition for he would be making a philosophical claim in that case. I further pointed out that if Craig is talking about a cognitive intuition, then we can dismiss such an intuition by appealing to the recognition-primed decision theory. A rebuttal that was unsuccessfully addressed was Craig's First Event Argument (FEA), we saw in 4.3.1 that both Morriston and Puryear were unsuccessful in their attempt to address this rebuttal. I addressed this rebuttal by showing that the assumption the argument relies on which is that an event can only occur if the event that precedes it has occurred must be false given the A-theory of time and the existence of the universe. My answer also gave us the first argument against the second premise.

Before we end, I want to give a suggestion to a natural theologian who might wish to salvage the standard version of KCA. Such a natural theologian could reject the A-theory of time and accept the B-theory of time. The reason the natural theologian should do this is that the universe comes out as necessarily past-infinite given the A-theory of time and the best model of the Big Bang theory, which is the Eternal Inflation model. While under the B-theory the second premise would be false as it now stands, the natural theologian could rephrase it to instead say the universe is finite to the past, and this premise could be true given the B-theory and the Eternal Inflation model. This natural theologian would also have to reject CP, which is the first premise of KCA since CP is nullified by the B-theory. This natural theologian could replace CP with a version of PSR that is more modest than the PSR we saw above. This modest PSR could allow for some brute facts such as BCCF. This modest PSR would, however, have to make it necessary that there is an explanation for why a universe that is finite to the past exists. This version of PSR would also have to require that such an explanation could not be the universe itself.

Though Erasmus does not adopt the B-theory of time, he has reformulated KCA by changing CP with a modest version of PSR which states that every contingent concrete object
that exists has an explanation in an external state of affairs\textsuperscript{273}. This version of PSR is compatible with the B-theory, it applies to the universe since Erasmus define concrete as anything that isn't abstract, and a case can be made for a finite universe being contingent given that it's finite. Moreover, since it requires an explanation in an external state of affairs that would mean the finite universe could not be its own explanation and since this PSR only applies to concrete objects, it allows for brute facts such as BCCF. Erasmus version of KCA still fails because he bases it on the A-theory\textsuperscript{274} and keeps the second premise as it's formulated in the standard version of KCA. A natural theologian could easily fix this by dropping the A-theory and with a reformulation of the second premise.

Besides such a PSR, one would still need a successful argument for the universe being finite to the past. Now, I believe that Erasmus' case for his version of PSR fails. But it appears to me that it's more plausible that someone could successfully come up with a justification for Erasmus' PSR and for the universe being finite to the past than that one could successfully defend the standard KCA as it currently stands. For not only does the A-theory along with the best model for the best theory of the universe necessitate that the universe is infinite to the past, but the A-theory itself is problematic given the fact that it's taken to be incompatible with the special theory of relativity. So, a KCA that is based on the A-theory looks doomed. Therefore, I am more optimistic that one could up with a successful B-theory version of KCA.

I am interested in seeing if some natural theologian will come up with a successful B-theory version of KCA. If somebody does, then I would be more than interested in engaging such an argument. Of course, such a natural theologian would also have to come up with an argument for why the explanation of the finite universe has to be God or something that itself requires God as an explanation. My suggestion here is only for salvaging the standard version of KCA, not the extended one. The standard KCA, as it stands now, however, is a failure and it, therefore, poses no threat to those of us that identify as Atheists.

\textsuperscript{273} Jacobus Erasmus, \textit{The Kalām Cosmological Argument: A Reassessment} (Cham: Springer International Publishing, 2018), 161.
\textsuperscript{274} Ibid, 112.
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112


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