THE KALAM COSMOLOGICAL ARGUMENT AND THE POSSIBILITY OF AN ACTUALLY INFINITE FUTURE

Eric Sotnak

Abstract: Part of the kalam cosmological argument draws upon the claim that an actual infinite cannot exist. Classical theists also maintain both that some individuals will earn eternal life and that God infallibly foreknows the future. The claim that these latter two theses do not require that an actual infinite exists because God possesses an intuitive, rather than propositional intellect, is examined and rejected. Although the future is potential, rather than actual, classical theism requires that the future be, in a sense, actually infinite.

A skeptic died and to his surprise he found himself before the Pearly Gates facing none other than St. Peter. "Is this heaven?" he asked.
"As a matter of fact it is," replied St. Peter.
"And all the people here—they are happy?" asked the skeptic.
"Indeed, they are," said St. Peter, "blissfully happy."
"Eternally?" asked the skeptic.
St. Peter quipped, "Well, not *yet*."

The subject of this essay is a variant of the cosmological argument for the existence of God, or more accurately, a part of that argument. This argument, which has been referred to as the kalam cosmological argument, has been defended recently by several philosophers of religion. Perhaps the best known such defender is William Lane Craig.[1] I will confine my attention in this essay almost exclusively to the argument as it has been formulated and defended by Craig. Craig's version of the kalam argument may be expressed as follows:

(K1) Everything that begins to exist has a cause of its existence.

Eric Sotnak is Assistant Professor of Philosophy at the University of Akron, Akron, Ohio.

(K2) The universe began to exist.

—

(K3) Therefore, the universe has a cause of its existence.

The argument must be extended, of course, to show that the cause of the universe's existence is God,[2] but it will not be my concern to address that extension of the argument. Nor will it be my concern to address premise (K1) of the argument. The concern of this paper, rather, is one particular line of argument in defense of (K2). Specifically, I have in mind one of the supporting arguments for (K2) which depends on denying the possibility of an actually infinite collection. I will call this argument the *kalam supplement*:

(KS1) An actual infinite cannot exist.
(KS2) An infinite temporal regress of events is an actual infinite.
(KS3) An infinite temporal regress of events cannot exist.
(KS4) If an infinite temporal regress of events cannot exist, then the universe began to exist.

—

(K2) Therefore, the universe began to exist.

Premise (KS1) claims that an actual infinite is impossible. Presumably, it makes no difference whether what is proposed as actually infinite is a magnitude, a collection, a subdivision,[3] or a series of events; all of these we are to consider impossible. Although actual infinites are impossible, there may still be collections, magnitudes, subdivisions, or series which increase (or diminish) without limit. These are potential infinites. Craig explains:

> When Aristotle speaks of the potential infinite, what he refers to is a magnitude that has the potency of being indefinitely divided or extended. Technically speaking, then, the potential infinite at any particular point is always finite.[4]

A potentially infinite collection (or magnitude or series) is a sort of work in progress. Although at any particular time the collection is finite, it is continually being augmented, and at no time does this augmentation terminate. The idea behind a potentially infinite collection is not merely that of a finite collection to which some new addition could be made, but rather that of a collection that is growing without limit. In contrast, an actual infinite is described as "a determinate whole actually possessing an infinite number of members."[5] ". . . In an actual infinite, all the members exist in a determinate, completed whole. . . ."[6]

According to Craig, while there is no barrier to a potential infinite's existing, the same cannot be said of an actual infinite. Since an actual infinite is an impossibility, the series of past events in the universe cannot be actually infinite. Neither does it make sense to suggest that the series of past events is potentially infinite (in the past) since we cannot say that new past events are being continually added to the beginning of the series (though, of course, it is perfectly possible to add new events to the end of the series). The universe must, therefore, have come to exist at some definite point in the past.

William Lawhead has offered a criticism of Craig's thesis that an actual infinite is impossible in the form of what he calls the "neo-kalam argu-

ment."[7] Lawhead's argument is intended to show that denying the possibility of an actual infinite is at odds with the classically theistic doctrine that God possesses infallible foreknowledge of all future events. Lawhead's *neo-kalam argument* is as follows:

(NK1) An actual infinite cannot exist.
(NK2) If the series of future events is unending, then there exists an actual infinite.
—
(NK3) Therefore, there cannot be an unending series of future events.

On Craig's view, (NK2) ought to be rejected. The premise Craig would recommend in its place would be:

(NK2*) If the series of future events is unending, then there exists a potentially infinite collection.

Since there are no obstacles standing in the way of potentially infinite collections, Craig can replace (NK2) with (NK2*) and reject the conclusion of Lawhead's neo-kalam argument. Lawhead, however, has argued that Craig is committed to (NK2) because it is implied by claims that Craig, as a classical theist, must accept. Lawhead's *neo-kalam supplement* in support of (NK2) deserves careful inspection.

(NKS1) The series of future events in unending.
(NKS2) God has perfect knowledge of all future events.
(NKS3) The set of future events contained within God's knowledge constitutes a determinate, complete, actually infinite set.
—
(NK2) If the series of future events is unending, then there exists an actually infinite collection.[8]

Craig has replied to Lawhead's neo-kalam supplement by denying (NKS3).

William Alston has recently defended the view that God's knowledge is non-propositional in nature. His is a simple, intuitive knowledge that embraces all truth. Finite creatures break up the whole of what God knows into propositions which they know. But the fact that God's simple intuition can be broken down into a potentially infinite number of propositions does not entail that what God knows is an actually infinite number of propositions which he knows. In the same way one can admit potential infinites of extendability or divisibility without entailing actual infinities of positions of extension or division.[9]

If we are to accept that God's knowledge is intuitive and not propositional, we must distinguish between:

(A) All truth

And

(B) The set of all true propositions

Somehow God knows (A) without knowing (B). Yet at the same time, (A) must somehow include or subsume (B) in such a way that (B) is implied by or deducible from or otherwise "sunk in" (A). It is by no means clear how

this is to be understood. Perhaps we should try to construe this along the following lines. Consider a collection of dots which I shall call (α):

• • •

(α) can be perceived in two ways. First, it can be perceived as a set consisting of three distinct dots. But second, it can be perceived as a single visual (or conceptual?) object, that is "taken in all at once" so to speak; it is not constructed serially by adding each successive dot in the collection to the previous one until all dots are accounted for. The eyes, looking at the page, simply see the dots as a given whole. *Then*, the object can be broken down into its constituent parts to see it as consisting of three dots. Perhaps the relation between (A) and (B) is supposed to be like that, somehow. God sees all truth as a single cognitive object in much the same way as someone might perceive (α) as a single visual object.

It is by no means clear that this is adequate. Consider the following collection, which I shall call (β):

• •

This is also a line of dots that can be taken in as a single visual object rather than as a serially constructed set. But how many dots are there in the collection? The vast majority of people will be unable to answer that question without re-examining the line of dots and counting them. That there are twenty-four dots in the line is something I will not know until I have counted them. Therefore, the proposition "There are twenty-four dots in (β)" is a proposition which is only potentially known for me; I do not know the particular number of dots in (β) until I count them. Are we to understand the set of all true propositions as being, for God, somehow like the proposition "There are twenty-four dots in (β)" for a person who takes in (β) as a single visual object—a single line of dots?

If so, we have a very curious sort of situation. If that is how God's intuitive knowledge is to be understood, then it seems that we must accept that God's knowledge is what Descartes would have considered "confused."[10] Imagine trying to persuade Descartes or any of his near-contemporaries that God's knowledge, including his knowledge of the world, is in many cases less clear and distinct than ours.

Furthermore, one has to wonder whether or not it is really plausible to identify this sort of indistinct intuitive perception as knowledge. Here is another line of dots which I shall call (γ):

• •

Are there the same number of dots in (γ) as in (β)? It seems this cannot be answered without knowing how many dots there are both in (γ) and in (β). That is, it seems that in order for someone to be said to *know* (intuitively or otherwise) a line of dots, more is required than that the person merely be aware of the line of dots.[11] The person must also either know how many dots are in the line, or else be able to distinguish that line of dots from all other lines of dots, and this latter ability appears to presuppose the first.

In addition, when we ask what is involved in God's *knowing* all truth, it seems that more is required than God's simply *being able to* know any true

proposition. This would appear to make God's knowledge, itself, potentially infinite. But this does not seem to be what Craig and Alston have in mind. God's knowledge is not itself potentially infinite, but rather it somehow encompasses a potentially infinite number of true propositions, each of which could be "discovered" so to speak, by some finite creature endowed with a propositional, rather than intuitive, intellect. Otherwise there would be no way to distinguish between God's intellect and that of some propositional knower who was endlessly engaged in a process of discovering truths, for such a finite knower could also be said to know a potentially infinite number of propositions.

But let us suppose, for the sake of argument, that there is some sense in which God can be said to be omniscient, and to have an intellect which somehow embraces all truth without that consisting in a set whose members are all true propositions. We would then have reason to follow Craig in rejecting:

> (NKS3) The set of future events contained within God's knowledge constitutes a determinate, complete, actually infinite set.

Rather, we would have to accept something like:

> (NKS3*) The set of future events encompassed by God's intuitive intellect constitutes a potentially infinite set.

Clearly, replacing (NKS3) with (NKS3*) renders Lawhead's neo-kalam supplement invalid.

Even if it is conceded that God's intellect is intuitive, it need not follow that God's foreknowledge does not imply the existence of an actually infinite collection. Let us consider the collection of days of the afterlife of some particular individual, say, St. Peter. Peter's afterlife is unending. Is it actually infinite? I shall argue that it must be considered so. The *afterlife argument*, as I shall call it, is as follows:

> (AL1) God's intellect apprehends Peter's afterlife as unending.
> (AL2) If God's intellect apprehends Peter's afterlife as unending, then God's intellect either apprehends Peter's afterlife as potentially infinite or as actually infinite.
> (AL3) If God's intellect apprehends Peter's afterlife as potentially infinite, then there will be days of Peter's afterlife that will come to pass that are not included in God's intuitive apprehension of it.
> (AL4) There is nothing that will come to pass that is not included in God's intuitive intellect.
> (AL5) Therefore, God's intuitive intellect apprehends Peter's afterlife as actually infinite.
> (AL6) If God's intuitive intellect apprehends Peter's afterlife as actually infinite, then Peter's afterlife is actually infinite.
> (AL7) Therefore Peter's afterlife is actually infinite.
> (AL8) If Peter's afterlife is actually infinite, then an actual infinite is possible.
> ―
> (AL9) Therefore, an actual infinite is possible.

From St. Peter's own perspective, or that of any finite being, at any point during Peter's afterlife it will be seen as potentially infinite, since it will not

have been completed. But the divine intellect, extending intuitively to all truth, would apprehend Peter's afterlife as actually infinite. But whatever God's intellect (intuitively) apprehends to be the case, or encompasses, or includes as true, must actually be the case. Craig's insistence on God's intellect being intuitive rather than propositional notwithstanding, it is (NK1) that must be rejected rather than (NK2).

Whereas Lawhead's argument makes God's intellect actually infinite in the respect that it includes an actual infinity of true propositions, the afterlife argument makes Peter's afterlife itself actually infinite. Several possible replies to this line of argument must be considered.

The first objection to consider is that the future does not exist yet, and thus it is simply a confusion to think of the future as having any actuality. The future is potential, rather than actual, and so Peter's afterlife must be potentially infinite, rather than actually infinite. Craig, anticipating arguments such as the afterlife argument, attempts to forestall them as follows:

> . . . Past events have really existed; they have taken place in the real world, while future events have not, since they have not occurred. In no sense does the future actually exist—we must not be fooled by Minkowski diagrams of four-dimensional spacetime depicting the world line of some entity into thinking that future events somehow subsist further down the line. . . . The fact that we can mark out the future world line of an object in no way implies that these future events actually exist. Only the sequence of past events can [or rather, could, conceivably] count as an actual infinity.[12]

Some of this is, I think, quite correct. As Craig says, "clearly, past events are actual in a way that future events are not."[13] Still, past events are not (currently) actual. The future does not actually exist, at least not yet. But it is at precisely this point that we must think extra carefully. The future *will* actually exist. Furthermore, God, according to the classical theist, foreknows what the actual future will be. So, from the standpoint of divine foreknowledge (even if we assume that the divine intellect is intuitive, rather than propositional) it seems that there is a sense in which the future is actual after all, *viz.*, it is an actual object of divine omniscience.[14] From God's perspective (even if intuitive), the future is fully determinate in the sense that every event that will ever occur is included in God's knowledge.

According to the afterlife argument, the theist cannot insist that the future is merely potentially infinite. Craig would have us accept that "In the real sense, the set of all events from any point into the future is not an actual infinite at all, but a potential infinite. It is an indefinite collection of events, always finite, and always increasing."[15] This is inconsistent with (AL4), however. If the future is only potentially infinite from the standpoint of the divine intellect, then there will be days of Peter's afterlife that will not be foreknown by God (or even included in God's intuition) as part of Peter's future. What is right about Craig's position is that when Peter's afterlife is considered from the perspective of any finite knower, it will always be potentially infinite. But there is a difference between saying that Peter's afterlife is always potentially infinite from the standpoint of any

finite knower, and saying that Peter's afterlife itself is only potentially infinite. Peter's afterlife itself (not his afterlife as it is considered by any finite knower) either constitutes a potentially infinite series or an actually infinite series. The former is inconsistent with classical theism's insistence on divine omniscience, and therefore Peter's afterlife itself must be actually infinite.

Still, the point remains that the future is potential, rather than actual. But this does not necessarily imply that the future is potentially infinite rather than actually infinite. This is because the word "potential" means slightly different things when applied to the potential future and when applied to a potential infinite. When talking about the potential future, the subject is (all) the days which have yet to occur. The emphasis is on what will be, or what might be. In this sense of "potential" it makes perfect sense to say that an actual infinite is potential. Suppose (pace Craig's arguments against such a suggestion) an actually infinite number of acorns were to spring into existence, all at once, on August 5, 2162. From the standpoint of the present, this collection is potential in the sense that it will exist, but does not yet. Now, when talking about a potential infinite, the subject is not the collection of members yet to be added to the series, but rather the series insofar as it has already been partially completed and to which more members will be added. The emphasis here is on the incompleteness of the series. In fact, it is concerns about completeness that motivate, in part, Craig's rejecting the possibility of an actual infinite.

A second reply to the afterlife argument, then, is that it is impossible for Peter's afterlife to be actually infinite because an actual infinite must be *complete*.[16] Since Peter's afterlife will never be complete, it cannot be actually infinite. This could be called the *argument from incompleteness* (AI), and runs as follows:

> (AI1) There will never be a day of Peter's afterlife upon which Peter's afterlife will be complete.
> (AI2) If (AI1), then Peter's afterlife will never be actually infinite.
> ———
> (AI3) Therefore, Peter's afterlife will never be actually infinite.

One reply to this argument is to suggest that there will, in fact, be a day (perhaps even infinitely many days) on which Peter's afterlife is complete, but that day is infinitely removed from the beginning of Peter's afterlife. To suppose that this is impossible presupposes that between any two determinate members of a series there must always be a finite number of intermediate members. When dealing with infinite series however, it is not uncontroversially clear that this must be granted. Infinite series may have some very odd properties, indeed. Still, I will grant that this first reply has little intuitive plausibility, and so I will not attempt to defend it further.

The second reply to (AI) is to suggest that Peter's afterlife can be complete, and can, in fact, be actually infinite without there ever being any day on which it is actually infinite. Just as no number in the series of positive integers is infinitely large, but the series as a whole is actually infinite, in the same way, Peter's afterlife can be actually infinite without there being any

day on which his afterlife is actually infinite. The completeness of Peter's afterlife just is his infinite afterlife taken as a whole. Suppose there were an actually infinite number of days before the present in the universe's history. There would not, then, be any particular day in the past on which there were an infinite number of days until the present day, but that would not prevent the past from being actually infinite. To be sure, Craig has argued that it is impossible for the universe to have an actually infinite past history. For example, Craig argues that if the past history of the universe were actually infinite, then any given event that occurs would already have happened somewhere in the infinite past. But consider the claim that if the future were actually infinite, then any event that happens now would happen somewhere in the infinite future, instead. There is no plausibility to this argument, however, and the corresponding argument for the impossibility of an infinite past is equally bad.[17]

Perhaps the most important objection to the argument from incompleteness is that it presupposes that the sense in which an actually infinite collection would have to be complete is for it to be *completed* by terminating construction of the collection with a last member. But to terminate the collection through the addition of a last member would render the collection finite, rather than infinite.[18] A preferable account of the way an actually infinite series may be considered complete is for there to be no member of the collection that is left out or missing. An actually infinite collection would thus be complete (but neither finite nor *completed*) if nothing that is part of the collection at some time is left out. Of course, at any particular time in the course of Peter's afterlife, his afterlife will be finite, and thus not actually infinite; some days (an infinite number, in fact) will still be missing from the collection. But if one considers whether there are any days missing from God's intuitive apprehension of Peter's afterlife, the answer must be "no." The completeness of Peter's afterlife just *is* the totality of days included in the collection, and each day included in this totality will exist.[19]

To look at it another way, (AI) improperly assumes that the number of events that occur in the universe must always be totaled up at some particular time. Let us assume that the universe began to exist at a definite time. Since at any particular time the number of events in the universe's history will be finite, there will be no particular time at which the number of such events will be (actually) infinite. So far, so good. But this need not be taken to imply that the number of events in the universe will never be actually infinite. That only follows if the number of events in the history of the universe must always be considered relative to some particular time. Yet this forces a too-narrow view of what is involved in considering the universe's history. In the first place, it is contrary to the classical theist's view of divine omniscience. If God must always consider universal history relative to some particular time, he cannot simply know all the events that ever occur in the history of the universe, past, present, and future (especially not in a single intuition), but must, rather, always "time-stamp" his assessment of universal events. It is as though he may only say to himself that at thus-and-such

a time, thus-and-so many events will have occurred in the universe's history (or he must intuit only a portion of the universe's total history). God's knowledge of universal history would thus be constrained by time indices. Although some theists may be willing to accept this, most would not.

Nor are we mere mortals restricted to speaking meaningfully of the universe's history only relative to particular time-indices. There is no reason to think we cannot talk meaningfully about, simply, "all the events that will ever occur in the history of the universe" rather than "all the events that will ever occur in the history of the universe up to time index *t*."

If it is, indeed, possible to consider the entire future as a totality of events that have not yet occurred, but which will occur (and especially if this totality is infallibly foreknown by God), it is possible to respond to (AI) with the following *supplement to the afterlife argument*:

> (SAL1) There is no day of Peter's afterlife comprehended in God's intuitive apprehension of it that will not become actual.
> (SAL2) [=AL5] God's intuitive intellect apprehends Peter's afterlife as actually infinite.
> —
> (SAL3) Therefore, Peter's afterlife will come to exist as actually infinite.

Craig is mistaken, therefore, in saying, "When we speak of the potential existence of a statue we mean that there will be an actual statue. It is not so with the infinite. There will not be an actual infinite."[20] There will, indeed, be an actual infinite. Even if it is true that there will be no particular time at which Peter's afterlife is actually infinite,[21] it does not follow that Peter's afterlife will not be actually infinite in its totality.

The foregoing reply to (AI) also serves to address the second of Craig's philosophical arguments in support of the claim that the universe began to exist (premise K2 of the Kalam argument). This argument, which I will call the *addition argument* is as follows:

> (AA1) The temporal series of events is a collection formed by successive addition.
> (AA2) A collection formed by successive addition cannot be an actual infinite.
> —
> (AA3) Therefore, the temporal series of events cannot be an actual infinite.

The second premise of this argument, however, (AA2), need not be granted. In defense of this premise, Craig argues:

> Sometimes it is wrongly alleged that the reason an actual infinite cannot be formed by successive addition is that there is not enough time. But this is wholly beside the point. Regardless of the time involved an actual infinite cannot be completed by successive addition due to the very nature of the actual infinite itself. No matter how many elements one has added, one can always add one more. A potential infinite cannot be turned into an actual infinite by any amount of successive addition; they are conceptually distinct.[22]

It is true that no amount of time will allow an actual infinite to be formed by successive addition if the amount of time is finite. Nor will any

additional amount of time allow the collection to be completed through the addition of a last member. But if one is given an infinite amount of time, then one *can* construct an actual infinite—what will be actually infinite is the collection itself. Craig gives the following example:

> . . . Suppose we imagine a man running through empty space on a path of stone slabs, a path constructed such that when the man's foot strikes the last slab, a new one appears immediately in front of him. It is clear that even if the man runs for eternity, he will never run across all the slabs.[23]

Perhaps it is not so clear, after all. If the man runs for eternity, there will be no slab added to the path that the man will not run across. So, given infinite time, the man *will* run across all the slabs.

If the afterlife argument is sound, then the kalam cosmological argument is weakened, because one line of justification for the premise that the universe began to exist is seriously flawed, *viz.*, the argument that an actual infinite is impossible, and so there cannot be an actually infinite regress of past events. Even if it is granted that God's intellect is intuitive rather than propositional, the definition of a potential infinite as an uncompleted collection in-process rules out the possibility that God's intellect grasps an unending series of future events as potentially infinite. Intuitive or not, God's intellect (if he is to be truly omniscient) must at least somehow comprehend all reality, past, present, and future. If the future is unending, then it must be actually infinite from the standpoint of the divine intellect, since otherwise there will be future events that God's intellect does not comprehend. Although it may be true that future events are not actual until they occur, the thesis that God has perfect foreknowledge about future occurrences requires that there be no future events that God does not know. If he does not know future events by knowing an actually infinite number of propositions, but rather by a single intuition, that intuition must still be considered as encompassing an actually infinite number of future events.

None of this bears on Craig's arguments that there is empirical confirmation of the premise (K2) that the universe began to exist. Even if an actual infinite is possible, and it is, therefore, *possible* for the universe to have an actually infinite history, this possibility may not be realized. If this is so, then the kalam argument is not entirely dead in the water. Whether it is successful will depend both on its first premise, and on the extension of the argument which purports to show that only God could be the cause of the universe's existence.

REFERENCES

1. William Lane Craig, *The Kalam Cosmological Argument* (New York: Barnes and Noble, 1979) and William Lane Craig, *Theism, Atheism, and Big Bang Cosmology* (New York: Oxford University Press, 1993).

2. This argument is strikingly similar to the argument given by Pope Pius XII, commenting on the significance of the Big Bang theory of the origin of the universe: "With that concreteness which is characteristic of physical proofs, [science] has confirmed the contingency of the universe. . . . Hence, creation took place in

time. Therefore there is a Creator. Therefore, God exists!" *The Proofs for the Existence of God in the Light of Modern Natural Science; Address of Pope Pius XII to the Pontifical Academy of Sciences* (Washington, D.C.: National Catholic Welfare Conference, 1951), p. 17.

3. By a "subdivision" I mean a magnitude that is obtained by dividing a larger magnitude. I include geometric points as subdivisions, even though they are not really obtained by dividing any larger magnitude. Little hinges upon this, however.

4. Craig, *Theism, Atheism, and Big Bang Cosmology*, p. 5.

5. Ibid. p. 9.

6. Craig, *The Kalam Cosmological Argument*, p. 84.

7. William F. Lawhead, "The Symmetry of The Past and The Future in The *Kalam* Cosmological Argument," in *The Logic of Rational Theism*, ed. William Lane Craig and Mark S. McLeod, (Lewiston, NY: The Edwin Mellen Press, 1990), pp. 99–111.

8. Lawhead, p. 106.

9. Craig, *Theism, Atheism, and Big Bang Cosmology*, p. 94 . See also William Lane Craig, *Divine Foreknowledge and Human Freedom*. (Leiden: E.J. Brill, 1991), p. 288, note 12.

10. See John Cottingham, Robert Stoothoff, and Dugald Murdoch, trans., *The Philosophical Writings of Descartes*, Vol. 1, (Cambridge: Cambridge University Press, 1985), pp. 207–8.

11. This is contrary to Alston's characterization of intuitive knowledge. See William Alston, "Does God Have Beliefs?" *Religious Studies*, 22 (1986), p. 294. In fairness, Alston does say that [intuitive] knowledge of a fact is the immediate awareness *of that fact*, but more than this, it seems that knowledge of a fact requires that one be aware *that* it is a fact. For example, I might be aware of my brother's presence in the room without knowing that it is my brother who is in the room. In this situation I surely do not have intuitive knowledge of my brother's being in the room. At best, I have intuitive knowledge only that someone is in the room.

12. Craig, *The Kalam Cosmological Argument*, pp. 96–7.

13. Ibid. p. 97.

14. A comment by Robert Prevost is appropriate here: ". . . God's mode of knowledge, that is, how God knows particulars, intuitively or discursively, does not affect the object of knowledge." See Robert Prevost, "Classical Theism and the Kalam Principle," in *The Logic of Rational Theism*, pp. 113–125.

15. Craig, *The Kalam Cosmological Argument*, p. 97.

16. Ibid. pp. 67–8.

17. More extensive criticism of Craig's arguments along these lines for the impossibility of an infinite past can be found in David Conway, "'It Would Have Happened Already': On One Argument for a First Cause," *Analysis*, 44 (1984) pp. 159–66.

18. This supposes, as I have conceded for the sake of argument above, that it does not make sense to suppose the last member to be infinitely removed from the first.

19. This also suggests a sort of resolution of the Tristram Shandy paradox which Craig invokes as part of his case against the possibility of an actual infinite. In writing his autobiography, Tristram Shandy requires one year to write about each day of his life. If he is mortal, he will never finish the work. But suppose he is immortal, and has an infinite amount of time to write the autobiography. Now since there are the same number of years as there are days in his eternal life, he can, according to Bertrand Russell, complete the work. But this is impossible, Craig maintains, since Tristram Shandy will fall farther and farther behind as time goes by. But if we understand "complete" to mean that nothing is left out, the situation is as follows: There is no day of Tristram Shandy's life that will be left out of the autobiography, and so the autobiography, while never completed, will nevertheless

be complete. Every day of Tristram Shandy's life will, eventually, be recorded. (See Craig, *Theism, Atheism, and Big Bang Cosmology*, pp. 33–34.)

20. Ibid. p. 5.

21. Notice that if arguments against the possibility of an actually infinite past are unsound, and the past really is actually infinite, then it will be false that there is no particular time at which the number of events in the universe's history is actually infinite. On the contrary, at any particular time in the universe's history, the number of events in the universe's history will be actually infinite. Nor must it be granted that because new events are taking place, the past is therefore incomplete because some events are missing from the universe's history until they occur. An infinite past can still be complete in the sense that if one were to count backward endlessly from a particular event in the universe's history, there would be no preceding event that would go uncounted.

22. Craig, *The Kalam Cosmological Argument*, p. 104.

23. Ibid. p. 104.