CRAIG'S KALAMITOUS COSMOLOGICAL ARGUMENT: 
A REPLY TO HIS "GOD, TIME, AND INFINITY"

[Debated in a Philosophy seminar at Simon Fraser University 1994]

I want to begin by paying a tribute to Dr. Craig for having rehabilitated the old 
Arabic *kalam* cosmological argument, and for the ingenuity he has exercised in 
its defence. The *kalam* argument seems to me deserving of attention not only 
because of its alleged implications for metaphysics, and that special branch 
thereof which we call theology, but also for the issues it raises in the philosophy 
of mathematics and philosophy of logic.

Nowhere - to my knowledge - is Craig's argumentative quick-footedness 
better displayed than in today's paper where he attempts to rebut some recent 
criticisms of the *kalam* argument's second premise - the claim that the universe 
had a beginning. These criticisms have afforded him the opportunity to restate 
some of his objections to the contrary supposition - the supposition that the 
universe had no beginning but has existed for an infinitely long time. Appealing 
to paradoxes generated by the supposition that reality might contain a library with 
ininitely many books, he argues that the supposition that reality might contain an 
actual infinity of past events is similarly paradoxical, indeed impossible. And 
appealing to the Tristram Shandy paradoxes, he argues that a series which, like 
the temporal series, has been formed by successive addition of one event after 
another can never be an actually infinite series.

Some of the moves Craig makes against his critics are so swift that I am 
not sure I have followed them or fully understood their import. I am unclear, for 
example, as to how the distinction between logical possibility and what he calls 
"ontological possibility" (p. 3) is to be understood and deployed. I am not at all 
sure what to make of his suggestion that the Principle of Correspondence is 
"merely a convention of set theory [which] we are free to reject ... while still 
holding to the Axiom of Infinity (that an infinite set exists)." (p.9). And I am 
surprized at his supposition that, were there to have been infinitely many past 
days which Tristram Shandy records, then there must have been a "first infinitely 
distant day" (p. 13) on which he began his autobiography; for if Shandy had been 
writing his autobiography from all eternity then there would be no such first day, 
not even an infinitely distant one.\(^1\) I am not even sure, for that matter, whether it 
is Craig or his critics who should be regarded as victorious in these little 
skirmishes. Nor do I really care. For whether or not the second premise survives 
these criticisms, it seems to me that there are several deeper criticisms to be 
made both of it and of Craig's *kalam* argument as a whole. Therefore invite Dr. 
Craig to join me in a broader discussion of the issues which I now raise.

\(^1\) My surprize stems from the fact that when John Mackie accused Craig of making 
eactly this sort of illegitimate supposition, Craig denied that he had done so.
I: Premise 2 and the impossibility of actual infinites.

Craig (following Aristotle, Kant, and others) distinguishes between two kinds of infinity, actual and potential, and argues for the impossibility of the former but not of the latter. Later I will explore just how the distinction is supposed to be drawn and raise a question as to its relevance to the kalam argument. But for now I want to concentrate on Craig's claim that the statement

(1) There is an actually infinite number of things

is in some sense "absurd" or "impossible".

How exactly are we to understand this? First we need to ask whether Craig is asserting

(2) (1) is impossible in mathematics as well as in the real world

or only

(3) (1), though it is possible in mathematics, is impossible in the real world.

In his book *Apologetics: as Introduction*, Craig seems to commit himself to (2). As against fellow-theist William Wainwright's suggestion that paradoxes such as those of an infinite library or infinite hotel can be avoided by recognizing that in set-theory an actually infinite set *is* equinumerous with certain of its proper subsets, Craig replies (along with Hilbert) that such paradoxes are merely ways of illustrating the paradoxical nature of Cantorian set-theory itself. (p. 78). But this will not do. For if the presence of paradox in (1) is tantamount, as Craig seems to think it is, to the conceptual incoherence or logical inconsistency of (1), then he will have to demonstrate, for instance, that there is something wrong with Euclid's proof of the existence of an actual infinity of prime numbers, and - more generally - that there is something fallacious about proofs of the consistency of Cantorian set-theory.

But perhaps when he wrote this in *Apologetics*, he was merely being incautious. In any case, Craig elsewhere takes pains to point out that what he really wants to assert is not (2) but the weaker (3). In his book *The Existence of God and the Beginning of the Universe* he explains: "When I say that an actual infinite cannot exist, I mean 'exist in the real world' or 'exist outside mind'. I am not in any way questioning the legitimacy of using the concept of actual infinity in the realm of mathematics, which is a realm of thought only. What I am arguing is that an actual infinite cannot exist in the real world of stars and planets and rocks and men." (p. 42). And in the present paper he takes pains to point out that "Our case against the existence of the actual infinite says nothing about the use of the idea of the infinite in conceptual mathematical systems." (p. 8).
But again this will not do. For whereas (2) would pit him against a number of truths of mathematics, (3) pits him against an important truth of modal logic. Modal logic, in general, is that branch of logic which deals with notions such as those of possibility, impossibility and necessity. Of various alternative modal systems, one called "S5" has commended itself to most philosophers of logic as that which best formalizes our notions of logical possibility, impossibility and necessity. And, since it also seems best to capture what might be called the "God's-eye point of view" of modal matters, S5 also has commended itself to those theists who, like Alvin Plantinga, recognize the importance of modal notions for theology. Yet S5 has, as its distinctive axiom, the thesis [expressed in ordinary English]

(4) If P is logically possible then it is necessarily true that P is possible

And this means that if a proposition like (1) is possible at all, then it is necessarily possible, i.e., not possibly impossible. For, you see, (4) is equivalent to

(5) If P is logically possible then it is not possible that P is not possible.

On the preferred analysis of possibility, then, it is inconsistent to say - as does Craig - that (1) is possible in the world of mathematics but impossible in the real world. That is to say, his (3) involves contradiction.

Let's, however, be charitable and assume that Craig doesn't mean what he repeatedly says, viz., (3), but means something else instead. Following a suggestion of Plantinga (who agrees that (3) is incoherent), let us suppose that what Craig really wants to say is that

(6) There are actual infinities of certain abstract things, such as numbers

is true, or at least possibly true, while

(7) There are actual infinities of certain non-abstract things such as objects, events, and moments of time

is false, and necessarily so, i.e., is impossible. There seem not to be any logical considerations, to do with S5 or any other plausible system of modal logic, to preclude him from asserting (6) and denying (7). But now the question arises as to what arguments might be advanced against (7) which do not count equally against (6). The trouble is that the only argument which Craig seems to advance against (7) is one which exploits the counter-intuitiveness of

(8) Some sets have equi-numerous proper subsets

a claim which results from adopting the Principle of Correspondence, viz.,
The members of a set having cardinality Aleph-zero may be put into one-one correspondence with certain of their proper subsets and abandoning the Euclidean dictum

The whole is always greater than the part.

Now it is true that (8) is counter-intuitive for sets of books, events and moments of time. But it is equally counter-intuitive for the case of numbers and other abstract objects. (Surely, our Euclidean-educated intuitions prompt us to say, there are "more" integers than natural numbers, "more" natural numbers than odd numbers, and "more odd numbers" than prime numbers - no matter whether numbers are Platonic entities or conceptual constructions.)\(^2\) Craig's argument for the impossibility of (7) applies mutatis mutandis to (6) as well. Yet (6) is not impossible, on the view we are examining. So at the very least, Craig owes us an account of why the counter-intuitiveness of (8) does not apply equally to (6) as well as (7).

Perhaps, to be charitable still once more, this is where we should take account of Craig's distinction between logical possibility and ontological possibility. Might he not be saying that both (6) and (7) are logically possible (i.e., such that there are possible worlds in which each is true) but denying that (7) is ontologically possible? He might. But in that case he will owe us an account of how ontological possibility differs, on the one hand, from logical possibility, and on the other hand from simple truth (i.e., from being true in the actual world). Does he want to say, for instance, that (7) might be ontologically possible in some other world even though it isn't in ours? More importantly, he will owe us an argument for saying that (7) is ontologically impossible in the real world where that argument does not draw on the counter-intuitiveness of (8) (since, as we have seen, (8) counts equally against (6)).

II: The distinction between actual and potential infinites.

Although a number of philosophers have doubted whether a distinction can be made, Craig is confident that he can draw it with some precision. "A collection," he explains, "is actually infinite if a part of it equals the whole of it." And a little later:

The concept of actual infinity is used in set-theory to designate a set which has an actually infinite number of members. . . . But the concept of potential infinity finds no place in set theory, because the members of a set must be definite, whereas a potential infinite is indefinite and acquires new members as it grows. . . .

\(^2\) This point is important since Craig, at one point, seems to say that problems about the actual infinitude of numbers arise only on a Platonic realist account of mathematics.
proper place for the concept of the potential infinite is found in
mathematical analysis, as in infinitesimal calculus. There a
process may be said to increase or diminish to infinity, in the sense
that that process can be continued endlessly with infinity as its
terminus.  

Mathematicians, he points out, even reserve different symbols for these two
concepts of infinity, using the Hebrew letter Aleph for an actual infinity, the
symbol \( \infty \) for the potentially infinite.

As an example of a series which is actually infinite he cites the series of
natural numbers. This series, of course, is defined by the expression

\[(11) \quad 0, 1, 2, 3 \ldots n+1.\]

And, as he points out, it comprises an actual infinity since - as Galileo noted in
1638 and Cantor reiterated in the 19th century - it has a number of proper
subsets (e.g., the set of odd numbers, the set of primes) which, by (9) (the
Principle of Correspondence), are equinumerous to the set itself.

As for examples of potentially infinite series, Craig gives none. But my
authority on most mathematical matters, Ian Stewart (in *The Concepts of Modern
Mathematics* (p. 230)), tells me that an expression such as

\[(12) \quad 1 + 1/2 + 1/4 + 1/8 + \ldots + 1/2^n\]

defines an infinite series in mathematical analysis; and since it is one which
satisfies Craig's criteria for being potential rather than actual, I conclude that
Craig would call it a merely potential infinite.

So far, so good. But I confess to some confusion as to the nature of the
distinction here invoked. Is a series, *in itself*, just one or the other? Or may one
and the same series be both, depending on how one thinks of it? My puzzlement
stems from the fact that I seem to be able to think of all the rational numbers
defined by (12) as a set the members of which can be put into a one-one
correspondence relation both with the actually infinite set of natural numbers and
with the actually infinite set of odd numbers, from which it follows that *from a set-
theoretic point of view*, the series given in (12) *is* itself an actual infinite even
though from the point of view of analysis it is merely a potential one.

Nor is my puzzlement lessened by Craig's own attempt to illustrate the
difference between these two kinds of infinites. In *The Existence of God*, he
writes:

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A good example contrasting these two kinds of infinity is the series of past events. If, as the atheist claims, the universe is eternal, then there have occurred in the past an actually infinite number of events. But from any point in the series of events, the number of future events is potentially infinite.

Thus, if we pick 1845, the birth year of Georg Cantor, who discovered infinite sets, as our point of departure, we can see that past events constitute an actual infinity while future events constitute a potential infinity. . . . This is because the past is realized and complete, whereas the future is never fully actualized, but is always finite and always increasing. (p. 41)

I have a hunch that Craig is here equivocating on the sense of "complete", taking it both in the temporal sense to mean "has already happened", and in the mathematical sense to mean "comprising a determinate set". But while the first of these senses is legitimate, it is hardly relevant to the question whether the series of past events is constitutes an actual infinite set in Cantor's sense. And in the second sense, which is relevant to issues about actual infinity, I fail to see how the set of future events is any less determinate than the set of past events. I also fail to understand what Craig means when he says that the future is "never fully actualized". Obviously he doesn't mean that future events never come to pass. And if he means only that the series of future events has no end, then it seems in no relevant way different from a series of past events which has no beginning, since both are, as it were, "open-ended".

Be all this as it may, Craig's claim

(13) From any point in the series of events, the number of future events is potentially infinite

entails

(14) There is no point in the series of events - no matter how far back in the actually infinite series of past events - from which the number of succeeding events is not potentially infinite.

And since I cannot see why he would want to assert (13) without also wanting to assert

(15) From any point in the series of events, the number of past events is actually infinite

which in turn entails

(16) There is no point in the series of events - no matter how far
forward in the potentially infinite series of future events - from which the number of preceding events is not actually infinite

it seems, once more, that Craig is committed to saying - as I too am somewhat inclined to say - that the properties of being actual and being potential are not intrinsic to infinite series themselves but are relative to whether or not one is adopting a set-theoretic, and in particular a Cantorian set-theoretic, point of view.4 But if that is the case, then (provided we don't think of the infinite series past events in set-theoretic terms) there would seem not to be any good reason for rejecting the existence of such a series. Hence there would seem not to be any good reasons to do with the nature of infinity for asserting the second premise of the *kalam* argument, viz., that the universe began to exist.5

My puzzlement about how Craig thinks of the distinction between actual and potential infinites is only exacerbated by his curious remark, noted above, that "If we . . . hold that the Principle of Correspondence is merely a convention of set theory, then we are free to reject it while still holding to the Axiom of Infinity (that an infinite set exists)." (p. 9). Here Craig seems to be saying that there is nothing wrong after all with the supposition that infinite sets exist but only with a certain *theory* about their nature, viz., the Cantorian theory which adopts the wholly unnecessary, because purely conventional, Principle of Correspondence, ((8) above). Yet if this is view, then since the paradoxes of infinity which he has been parading seem to arise only if we accept (8), it would seem that once more he has no argument for asserting the finitude of past states of the universe.

III: **Premise 1: the Causal Principle**

I have few qualms about accepting the first premise of the *kalam* argument, viz.,

(17) Whatever begins to exist has a cause.

For (17), it is clear, is but an alternative formulation of (or at least implies) the so-

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4 Further evidence that this is indeed Craig's position seems to be afforded by his otherwise curious claim that "If we . . . hold that the Principle of Correspondence is merely a convention of set theory, then we are free to reject it while still holding to the Axiom of Infinity (that an infinite set exists)."

5 Alternatively, if there is good reason for rejecting as impossible the existence of an infinite *set* of past events, then there would seem to be equally good reason to reject as impossible the existence of an infinite *set* of future events. And in that case, we should have to conclude not only that there was a beginning to both the temporal series of events and the universe but also that there will be an end to both. But while we might welcome the prospect of the universe (this vale of tears) coming to an end, few will sanguine about the idea of there being an end to the series of events. For that would seem to be tantamount to a denial of the kind of immortality which orthodox Christianity promises.
called Causal Principle

(18) Every event has a cause.

And, setting aside dubious arguments for the ontological indeterminacy of microphysical events, I join with both Craig and his atheist critic John Mackie in holding that (at least at the macrophysical level) (18) "is constantly confirmed in our experience."

However, I fail to understand how Craig can accept the Causal Principle as true since it seems incompatible both with some of the things he says in defence of Premise 2, viz.,

(19) The universe began to exist

and with some of the things he says by way of expansion of the conclusion, viz.,

(20) The universe had a cause.

Let me explain.

Upon analysis, (18) is equivalent to

(21) For every event x there exists some other event y such that y is a temporally prior cause of x, and hence is either a mediate or an immediate predecessor of x.

Now obviously (21) is akin to

(22) For every natural number x there exists some other natural number

6 It seems clear that this is how Craig himself understands (17). What leads me to say this is first and foremost the fact that (17) on analysis yields (18). Trivially, to say that something "begins to exist" is to say that something "happens"; and to say that something happens - as Craig himself points out in The Existence of God (p. 46) - is just to say that an event occurs. Thus to say that whatever begins to exist has a cause is just another way of saying (or at least implies) that every event has a cause. Secondly, both in Apologetics (p. 75) and The Existence of God (p. 83) Craig defends (17) by invoking the authority of other philosophers who explicitly endorsed the Causal Principle in some form only stylistically different from (18). For instance, he cites David Hume's claim that he "never asserted so absurd a Proposition as that anything might arise without a cause." And he cites, with evident approval, C. D. Broad's claim that he "cannot really believe in anything beginning to exist without being caused by something which existed before and up the moment when the thing in question began to exist."

7 Craig would have to agree. In his Review of Richard Sorabji's Time, Creation and the Continuum, (p. 321), he argues on the basis of the A-theory of time that "at the time of the effect the cause no longer exists." This claim shows that, on his view, causes are both distinct from and temporally prior to their effects.
y such that y is a successor of x, and hence is either a mediate or an immediate successor of x.

In each case we are dealing with a relation R (being a temporally prior cause of, in the one case; being a successor of, in the other) which satisfies each of the following four conditions

(23) **Existence.** \((\sum x) (\sum y) \ R_{xy}\)  
"Something exists which has R to something"

(24) **Asymmetry.** \((x) (y) (R_{xy}) \not\sim R_{yx}\)  
"If x has R to y, then y does not have R to x"

(25) **Transitivity.** \((x) (y) (z) ((R_{xy} \land R_{yz}) \not\sim R_{xz})\)  
"If x has R to y which in turn has R to z, then x has R to z"  
and

(26) **Existential Heredity.** \((x) (y) (R_{xy}) \land (\sum z) R_{zx}\)  
"If x has R to y, then something has R to x."

But David Sanford has shown that when any relation satisfies these four conditions then its relata constitute what he calls an "R-connected set" the members of which are infinite in number.¹⁸

Here, then, is the rub. For (21), like (22), generates precisely what Craig - in his defence of (19) (the second premise of the *kalam* argument) - claimed could not exist, viz., an actually infinite set of things. Indeed, (21) generates two such allegedly impossible sets. It implies both

(27) **There exists an actual infinity of events**

and

(28) **There exists an actual infinity of moments of time.**

Yet Craig relied on the falsity - indeed the alleged impossibility - of both (27) and (28) in order to mount his defence of (19).

Not only is his commitment to (17) (the first premise of the *kalam* argument) inconsistent with his defence of (19) (the second premise); it is also inconsistent with his understanding of (20) (the conclusion of the *kalam* argument).

¹⁸ David H. Sanford, "Infinity and Vagueness", pp. 534 - 535. [Reference to be supplied.]
In the introduction to his paper he tells us that "further analysis of the cause [of the universe] reveals that it must be an uncaused, changeless, timeless, immaterial, spaceless, powerful, and personal being; thus corresponding to the core conception of what theists mean by 'God'". (p. 1) But the trouble is, of course, that if the Causal Principle, (17), is true, then God's being the cause of the universe puts him squarely both into the causal series of changing (i.e., non-identical) events and into the temporal series in such a way that he cannot be said to be either uncaused, or changeless, or timeless.

C. J. Ducasse once described the naive, "First Cause", version of the cosmological argument as "a logical monstrosity" on the grounds that its conclusion is inconsistent with its major premise. I am claiming that Craig's more sophisticated version is doubly a logical monstrosity since its major premise is inconsistent not only with its conclusion but with the kalam defence of its minor premise as well.

IV: God's Timelessness.

Craig's claim, in the above passage, that God is timeless, stands in need of qualification. It turns out that on his view God is not now timeless since he engages in temporal and causal exchanges with the universe and its denizens. But once upon a time, as it were, he was timeless. He was timeless, according to Craig, "prior" to creating both the universe and time itself.

Here is how Craig describes his kalam cosmology:

Prior to creation, there was no time at all, for time cannot exist unless there is change. God himself is changeless, otherwise you would find an infinite series of past events in his life, and we know that such an infinite series is impossible. So God is changeless, and hence timeless, prior to creation.9

I am troubled on several scores.

First, I have difficulty attaching any clear sense to the claim that time did not exist prior to creation, since "prior to creation" here must surely mean "at a time preceding creation", so that what is being asserted is that at a time preceding creation, there was no time! But lest this be thought to be merely a minor semantic quibble about a mode of expression, I'll let the point go.

A more serious complaint has to do with Craig's claim that time cannot exist without change, a claim which (as he notes elsewhere) has been disputed by Sydney Shoemaker. But since this issue is too large to discuss here, I'll again not pursue it but will merely record the fact that my own cosmology asserts only

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9 The Existence of God, p. 87.
that change cannot occur without the passage of time, but not the converse.

My third, and final, concern - one on which I do want to engage Dr. Craig, albeit briefly - is primarily theological, though it raises issues in philosophy of mind (more particularly, the philosophy of personhood) as well. Both my concern, and Craig's reply to it, have already been expressed - in part - by Craig himself in his review of a book by Richard Sorabji. The objection is that "it is incoherent to ascribe will, knowledge, thought, judgement, love or any form of consciousness to a timeless being." Craig's response is that "these are the very sort of attribute which . . . are most easily attributed to a timeless God, as opposed to, say, deliberation. To will timelessly means to intend changelessly and freely to execute a certain course of action. Knowledge, thought, and judgement may be timeless in that God knows the propositions comprising his store of knowledge without acquisition or change. . . ." (p. 324).

But how about such hard attributes as those of deliberation, and more importantly, agency and action? The latter seem every bit as important to our concept of personhood as do the attributes which Craig thinks he can so easily accommodate. Significantly, there are humans who at times possess the properties on Craig's easy list, but not the hard ones. We say that they are comatose. Craig's God, prior to creation, seems little different. But whereas there are physical causes which render mere humans comatose, and may be physical causes which enable them to recover, there are - if Craig is to be believed - purely logical ones (to do with the impossibility of actual infinites) for God's comatose condition and no conceivable causes for his emerging from that pitiful state.

I suspect that orthodox Christians would regard Craig's God as anathema. They have my sympathy. For it seems to me that Craig's kalam argument is monstrous not only logically but theologically also.

The postulation of a pre-creation comatose God prompts still other objections. Here are a couple of quickies:

Since being comatose would seem to have been God's chosen state "from all eternity" (prior to creation), what guarantee do the faithful have that he will not one day decide to escape from involvement with us pitiful creatures (perhaps when the series of physical events reaches its end in the heat-death of the universe), revert to his preferred condition, and take us with him?

If a comatose God can be postulated as the cause of the universe's beginning, why can't a comatose universe perform the trick just as well?