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Philosophical and Scientific Pointers to Creatio ex Nihilo

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To answer Leibniz's question of why something exists rather than nothing, we must posit three alternatives: the universe either had a beginning or had no beginning; if it had a beginning, this was either caused or uncaused; if caused, the cause was either personal or not personal. Four lines of evidence, two philosophical and two scientific, point to a beginning of the universe. If the universe had a beginning, it is inconceivable that it could have sprung uncaused out of absolute nothingness. Finally, the cause of the universe must be personal in order to have a temporal effect produced by an eternal cause. This confirms the biblical doctrine of **creatio ex nihilo**.

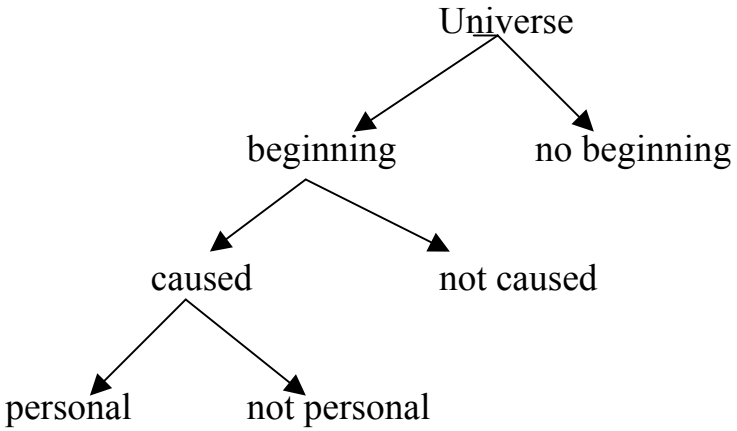
". . . The first question which should rightly be asked," Wrote Gottfried Wilhelm Leibniz, is "Why is there something rather than nothing?"[1] I want you to think about that for a moment. Why does anything exist at all, rather than nothing? Why does the universe, or matter, or anything at all exist, instead of just nothing, instead of just empty space?

Many great minds have been puzzled by this problem. For example, in his biography of the renowned philosopher Ludwig Wittgenstein, Norman Malcolm reports,

. . . he said that he sometimes had a certain experience which could best be described by saying that 'when I have it, *I wonder at the existence of the world*. I am then inclined to use such phrases as "How extraordinary that anything "should exist!" or "How extraordinary that the world should exist!"'[2]

Similarly, the English philosopher J. J. C. Smart has said, ". . . my mind often seems to reel under the immense significance this question has for me. That anything exists at all does seem to me a matter for the deepest awe."[3]

Why *does* something exist instead of nothing? Unless We are prepared to believe that the universe simply popped into existence uncaused out of nothing, then the answer must be: something exists because there is an eternal, uncaused being for which no further explanation is possible. But who or what is this eternal, uncaused being? Leibniz identified it with God. But many modern philosophers have identified it with the universe itself. Now this is exactly the position of the atheist: the universe itself is uncaused and eternal; as Russell remarks, ". . . the universe is just there, and that's all."[4] But this means, of course, that all we are left with is futility and despair, for man's life would then be without ultimate significance, value, or purpose. Indeed, Russell himself acknowledges that it is only upon the "firm foundation of unyielding despair" that life can be faced.[5] But are there reasons to think that the universe is not eternal and uncaused, that there is something more? I think that there are. For we can consider the universe by means of a series of logical alternatives:



By proceeding through these alternatives, I think we can demonstrate that it is reasonable to believe that the universe is not eternal, but that it had a beginning and was caused by a personal being, and that therefore a personal Creator of the universe exists.

Did the Universe Begin?

The first and most crucial step to be considered in this argument is the first: that the universe began to exist. There are four reasons why I think it is more reasonable to believe that the universe had a beginning. First, I shall expound two philosophical arguments and, second, two scientific confirmations.

The first philosophical argument:
1. An actual infinite cannot exist.
2. A beginningless series of events in time is an actual infinite.
3. Therefore, a beginningless series of events in time cannot exist.

A collection of things is said to be actually infinite only if a part of it is equal to the whole of it. For example, which is greater? 1, 2, 3, . . . or 0, 1, 2, 3, . . . According to prevailing mathematical thought, the answer is that they are equivalent because they are both actually infinite. This seems strange because there is an extra number in one series that cannot be found in the other. But this only goes to show that in an actually infinite collection, a part of the collection is equal to the whole of the collection. For the same reason, mathematicians state that the series of even numbers is the same size as the series of all natural numbers, even though the series of all natural numbers contains all the even numbers plus an infinite number of odd numbers as well. So a collection is actually infinite if a part of it is equal to the whole of it.

Now the concept of an *actual* infinite needs to be sharply distinguished from the concept of a *potential* infinite. A potential infinite is a collection that is increasing

without limit but is at all times finite. The concept of potential infinity usually comes into play when we add to or subtract from something without stopping. Thus, a finite distance may be said to contain a potentially infinite number of smaller finite distances. This does not mean that there actually are an infinite number of parts in a finite distance, but rather it means that one can keep on dividing endlessly. But one will never reach an "infinitieth" division. Infinity merely serves as the limit to which the process approaches. Thus, a potential infinite is not truly infinite--it is simply indefinite. It is at all points finite but always increasing.

To sharpen the distinction between an actual and a potential infinite, we can draw some comparisons between them. The concept of actual infinity is used in set theory to designate a set which has an actually infinite number of members in it. But the concept of potential infinity finds no place in set theory. This is because the members of a set must be definite, whereas a potential infinite is indefinite--it acquires new members as it grows. Thus, set theory has only either finite or actually infinite sets. The 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 the process can be continued endlessly with infinity as its terminus.[6] The concept of actual infinity does not pertain in these operations because an infinite number of operations is never actually made. According to the great German mathematician David Hilbert, the chief difference between an actual and a potential infinite is that a potential infinite is always something growing toward a limit of infinity, while an actual infinite is a completed totality with an actually infinite number of things.[7] A good example contrasting these two types of infinity is the series of past, present, and future events. For if the universe is eternal, as the atheist claims, 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 birthyear 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. In the following discussion, it is exceedingly important to keep the concepts of actual infinity and potential infinity distinct and not to confuse them.

A second clarification that I must make concerns the word "exist." When I say that an actual infinite cannot exist, I mean "exist in the real world" or "exist outside the mind." I am not in any way questioning the legitimacy of using the concept of actual infinity in the realm of mathematics, for this 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. What I will argue in no way threatens the use of the actual infinite as a concept in mathematics. But I do think it is absurd that an actual infinite could exist in the real world.

I think that probably the best way to show this is to use examples to illustrate the absurdities that would result if an actual infinite could exist in reality. For suppose we have a library that has an actually infinite number of books, on its shelves. Imagine furthermore that there are only two colors, black and red, and these are placed on the shelves alternately: black, red, black, red, and so forth. Now if somebody told us that the number of black books and the number of red books is the same, we would probably not be too surprised. But would we believe someone who told us that the number of black books is the same as the number of black books plus red books? For in this latter collection there are all the black books plus an infinite number of red books as well. Or imagine there are

three colors of books or four or five or a hundred. Would you believe someone if he told you that there are as many books in a single color as there are in the whole collection? Or imagine that there are an infinite number of colors of books. I'll bet you would think that there would be one book per color in the infinite collection. You would be wrong. If the collection is actually infinite then according to mathematicians, there could be for each of the infinite colors an infinite number of books. So you would have an infinity of infinities. And yet it would still be true that if you took all the books of all the colors and

added them together, you wouldn't have any more books than if you had taken just the books of a single color.

Suppose each book had a number printed on its spine. Because the collection is actually infinite, that means that every possible number is printed on some book. Now this means that we could not add another book to the library. For what number would we give to it? All the numbers have been used up! Thus, the new book could not have a number. But this is absurd, since objects in reality can be numbered. So if an infinite library could exist, it would be impossible to add another book to it. But this conclusion is obviously false, for all we have to do is tear out a page from each of the first hundred books, add a title page, stick them together, and put this new book on the shelf. It would be easy to add to the library. So the only answer must be that an actually infinite library could not exist.

But suppose we *could* add to the library. Suppose I put a book on the shelf. According to the mathematicians, the number of books in the whole collection is the same as before. But how can this be? If I put the book on the shelf, there is one more book in the collection. If I take it off the shelf, there is one less book. I can see myself add and remove the book. Am I really to believe that when I add the book there are no more books in the collection and when I remove it there are no less books? Suppose I add an infinity of books to the collection. Am I seriously to believe there are no more books in the collection than before? Suppose I add an infinity of infinities of books to the collection. Is there not now one single book more in the collection than before? I find this hard to believe.

But now let's reverse the process. Suppose we decide to loan out some of the books. Suppose we loan out book number 1. Isn't there now one less book in the collection? Suppose we loan out all the odd-numbered books. We have loaned out an infinite number of books, and yet

mathematicians would say there are no less books in the collection. Now when we loaned out all these books, that left an awful lot of gaps on the shelves. Suppose we push all the books together again and close the gaps. All these gaps added together would add up to an infinite distance. But, according to mathematicians, after you pushed the books together, the shelves will still be full, the same as before you loaned any out! Now suppose once more we loaned out every other book. There would still be no less books in the collection than before. And if we pushed all the books together again, the shelves would still be full. In fact, we could do this an infinite number of times, and there would never be one less book in the collection and the shelves would always remain full. But suppose we loaned out book numbers 4, 5, 6, . . . out to infinity. At a single stroke, the collection would be virtually wiped out, the shelves emptied, and the infinite library reduced to finitude. And yet, we have removed exactly the same number of books this time as when we first loaned out all the odd numbered books! Can anybody believe such a library could exist in reality?

These examples serve to illustrate that *an actual infinate cannot exist* in the real world. Again I want to underline the fact that what I have argued in no way attempts to undermine the theoretical system bequeathed by Cantor to modern mathematics. Indeed, some of the most eager enthusiasts of trans-finite mathematics, such as David Hilbert, are only too ready to agree that the concept of actual infinite is an idea only and has no relation to the real world. So we can conclude the first step: an actual infinite cannot exist.

The second step is: *a beginningless series of events in time is an actual infinite*. By "event" I mean something that happens. Thus, this step is concerned with change, and it holds that if the series of past events or changes just goes back and back and never had a beginning, then, considered all together, these events constitute an actually

infinite collection. Let me provide an example. Suppose we ask someone where a certain star came from. He replies that it came from an explosion in a star that existed before it. Suppose we ask again, where did that star come from? Well, it came from another star before it. And where did that star come from?--from another star before it; and so on and so on. This series of stars would be an example of a beginningless series of events in time. Now if the universe has existed forever, then the series of all past events taken together constitutes an actual infinite. This is because for every event in the past, there was an event before it. Thus, the series of past events would be infinite. Nor could it be potentially infinite only, for we have seen that the past is completed and actual; only the future can be described as a potential infinite. Therefore, it seems pretty obvious that a beginningless series of events in time is an actual infinite.

But that leads us to our conclusion: *therefore, a beginningless series of events in time cannot exist*. We have seen that an actual infinite cannot exist in reality. Since a beginningless series of events in time is an actual infinite, such a series cannot exist. That means the series of all past events must be finite and have a beginning. But because the universe is the series of all events, this means that the universe must have had a beginning.

Let me give a few examples to make the point clear. We have seen that if an actual infinite could exist in reality, it would be impossible to add to it. But the series of events in time is being added to every day. Or at least so it appears. If the series were actually infinite, then the number of events that have occurred up to the present moment is no greater than the number of events up to, say, 1789. In fact, you can pick any point in the past. The number of events that have occurred up to the present moment would be no greater than the number of events up to that point, no matter how long ago it might be.

Or take another example. Suppose Earth and Jupiter

have been orbiting the sun from eternity. Suppose that it takes the Earth one year to complete one orbit, and that it takes Jupiter three years to complete one orbit. Thus for every one orbit Jupiter completes, Earth completes three. Now here is the question: if they have been orbiting from eternity, which has completed more orbits? The answer is: they are equal. But this seems absurd, since the longer they went, the farther and farther Jupiter got behind, since every time Jupiter went around the sun once, Earth went around three times. How then could they possibly be equal?

Or, finally, suppose we meet a man who claims to have been counting from eternity, and now he is finishing: -5, -4, -3, -2, -1, 0. Now this is impossible. For, we may ask, why didn't he finish counting yesterday or the day before or the year before? By then an infinity of time had already elapsed, so that he should have finished. The fact is we could never find anyone completing such a task because at any previous point he would have already finished. But what this means is that there could never be a point in the past at which he finished counting. In fact we could never find him counting at all. For he would have already finished. But if no matter how far back in time we go, we never find him counting, then it cannot be true that he has been counting from eternity. This shows once more that the series of past events cannot be beginningless. For if you could not count numbers from eternity, neither could you have events from eternity.

These examples underline the absurdity of a beginningless series of events in time. Because such a series is an actual infinite, and an actual infinite cannot exist, a beginningless series of events in time cannot exist. This means that the universe began to exist, which is the point that we set out to prove.

The second philosophical argument:

1. The series of events in time is a collection formed by adding one member after another.

2. A collection formed by adding one member after another cannot be actually infinite.

3. Therefore, the series of events in time cannot be actually infinite.

This argument does not argue that an actual infinite cannot exist. But it does argue that an actual infinite cannot come to exist by the members of a collection being added one after the other.

The series of events in time is a collection formed by

adding one member after another. This point is pretty obvious. When we consider the collection of all past events, it is obvious that those events did not exist simultaneously--all at once--but they existed one after another in time: we have one event, then another after that, then another, then another, and so on. So when we talk about the collection of "all past events," we are talking about a collection that has been formed by adding one member after another.

The second step is the crucial one: *a collection formed by adding one member after another cannot be actually infinite*. Why?--because no matter how many members a person added to the collection, he could always add one more. Therefore, he would never arrive at infinity. Sometimes this is called the impossibility of counting to infinity. For no matter how many numbers you had counted, you could always count one more. You would never arrive at infinity. Or sometimes this is called the impossibility of traversing the infinite. For you could never cross an infinite distance. Imagine a man running up a flight of stairs. Suppose every time his foot strikes the top step, another step appears above it. It is clear that the man could run forever, but he would never cross all the steps because you could always add one more step.

Now notice that this impossibility has nothing to do with the amount of time available. It is of the very nature of the infinite that it cannot be formed by adding one member after another, regardless of the amount of time available. Thus, the only way an infinite collection could come to exist in the real world would be by having all the members created simultaneously. For example, if our library of infinite books were to exist in the real world, it would have to be created instantaneously by God. God would say: "Let there be. . . !" and the library would come into existence all at once. But it would be impossible to form the library by adding one book at a time, for you would never arrive at infinity.

Therefore, our conclusion must be: *the series of events in time cannot be actually infinite*. Suppose there were, for example, an infinite number of days prior to today. Then today would never arrive. For it is impossible to cross an infinite number of days to reach today. But obviously, today has arrived. Therefore, we know that prior to today there cannot have been an infinite number of days. That means that the number of days is finite and therefore the universe had a beginning. Contemporary philosophers have shown themselves to be impotent to refute this reasoning.[9] Thus, one of them asks,

> If an infinite series of events has preceded the present moment, how did we get to the present moment? How could we get to the present moment--where we obviously are now--if the present moment was preceded by an infinite series of events?[10]

Concluding that this difficulty has not been overcome and that the issue is still in dispute, Hospers passes on to another subject, leaving the argument unrefuted. Similarly another philosopher comments rather weakly, "It is difficult to show exactly what is wrong with this argument," and with that remark moves on without further ado.[11]

Therefore, since the series of events in time is a collection formed by adding one member after another, and since such a collection cannot be actually infinite, the series of events in time cannot be actually infinite. And once more, since the universe is nothing else than the series of events, the universe must have had a beginning, which is precisely the point we wanted to prove.

The first scientific confirmation: the evidence from the expansion of the universe. Prior to the 1920's, scientists assumed that the universe as a whole was a stationary object--it was not going anywhere. But in 1929 an astronomer named Edwin Hubble contended that this was not true. Hubble observed that the light from distant galaxies appeared to be redder than it should be. He explained this

by proposing that the universe is expanding. Therefore, the light from the stars is affected since they are moving away from us. But this is the interesting part: Hubble not only showed that the universe is expanding, but that *it is expanding the same in all directions*. To get a picture of this, imagine a balloon with dots painted on it. As you blow up the balloon, the dots get further and further apart. Now those dots are just like the galaxies in space. Everything in the universe is expanding outward. Thus, the relations in the universe do not change, only the distances.

Now the staggering implication of this is that this means that at some point in the past, *the entire known universe*

was contracted down to a single point, from which it has been expanding ever since. The farther back one goes in the past, the smaller the universe becomes, so that one finally reaches a point of infinite density from which the universe began to expand. That initial event has come to be known as the "big bang."

How long ago did the big bang occur? Only during the 1970's have accurate estimates become available. In a very important series of six articles published in 1974 and 1975, Allan Sandage and G. A. Tammann estimate that the big bang occurred about 15 billion years ago.[12] Therefore, according to the big bang model, the universe began to exist with a great explosion from a state of infinite density about 15 billion years ago. Four of the world's most prominent astronomers describe that event in these words.

> The universe began from a state of infinite density. Space and time were created in that event and so was all the matter in the universe. It is not meaningful to ask what happened before the big bang; it is somewhat like asking what is north of the north pole. Similarly, it is not sensible to ask where the big bang took place. The point-universe was not an object isolated in space; it was the entire universe, and so the only answer can be that the big bang happened everywhere.[13]

This event that marked the beginning of the universe becomes all the more amazing when one reflects on the fact that a state of "infinite density" is synonymous to "nothing." There can be no object that possesses infinite density, for if it had any mass at all, it would not be *infinitely* dense. Therefore, as astronomer Fred Hoyle points out, the big bang theory requires the creation of matter from nothing. This is because as one goes back in time, he reaches a point at which, in Hoyle's words, the universe was "shrunk down to nothing at all."[14] Thus, what the big bang model requires is that the universe had a beginning and was created out of nothing.

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Now some people are bothered with the idea that the universe began from nothing. This is too close to the Christian doctrine of creation to allow atheistic minds to be comfortable. But if one rejects the big bang model, he has apparently only two alternatives: the steady state model or the oscillating model. Let's examine each of these.

The steady state model holds that the universe never had a beginning but has always existed in the same state. Ever since this model was first proposed in 1948, it has never been very convincing. According to S. L. Jaki, this theory never secured "a single piece of experimental verification."[15] It always seemed to be trying to explain away the facts rather than explain them. According to Jaki, the proponents of this model were actually motivated by "openly anti-theological, or rather anti-Christian motivations.[16] A second strike against this theory is the fact that a count of galaxies emitting radio waves indicates that there were once more radio sources in the past than there are today. Therefore, the universe is not in a steady state after all. But the real nails in the coffin for the steady state theory came in 1965, when A. A. Penzlas and R. W. Wilson. discovered that the entire universe is bathed with a background of microwave radiation. This radiation background indicates that the universe was once in a very hot and very dense state. In the steady state model no such state could have existed, since the universe was supposed to be the same from eternity. Therefore, the steady state model has been abandoned by virtually everyone. According to Ivan King, "The steady-state theory has now been laid to rest, as a result of clear-cut observations of how things have changed with time."[17]

But what of the oscillating model of the universe? John Gribbin describes this model,

> The biggest problem with the big bang theory of the origin of the universe is philosophical--perhaps even theological--what

> was there before the bang? This problem alone was sufficient to give a great initial impetus to the steady state theory, but with that theory now sadly in conflict with the observations the best way around this initial difficulty is provided by a model in which the universe expands, collapses back again, and repeats the cycle indefinitely.[18]

According to this model, the universe is sort of like a spring, expanding and contracting from eternity. It is only in the last three or four years that this model has been discredited. The key question here is whether the universe is "open" or "closed." If it is "closed," then the expansion will reach a certain point, and then the force of gravity will pull everything together again. But if the universe is "open," then the expansion will never stop, but will just go on and on forever. Now clearly, if the universe is open, then the oscillating model is false. For if the universe is open, it will never contract again.

Scientific evidence seems to indicate that the universe is open. The crucial factor here is the density of the universe. Scientists have estimated that if there are more than about three hydrogen atoms per cubic meter on the average throughout the universe, then the universe would be closed. That may not sound like very much, but remember that most of the universe is just empty space. I shall not go into all the technicalities of how scientists measure the density of the universe,[19] but let me simply report their conclusions. According to the evidence, the universe would have to be at least ten times denser than it is for the universe to be closed.[20] Therefore, the universe is open by a wide margin. Let me share with you the conclusion of Alan Sandage: (1) the universe is open, (2) the expansion will not reverse, and (3) the universe has happened only once and the expansion will never stop.[21] The evidence therefore appears to rule out the oscillating model, since it requires a closed universe. But just to drive the point home, let me add that the oscillating

model of the universe is only a theoretical possibility, not a real possibility. As Dr. Tinsley of Yale observes, in oscillating models

> . . . even though the mathematics says that the universe oscillates, there is no known physics to reverse the collapse and bounce back to a new expansion. The physics seems to say that those models start from the big bang, expand, collapse, then end.[22]

Hence, it would be impossible for the universe to be oscillating from eternity. Therefore, this model is doubly impossible.

The second scientific confirmation: the evidence from thermodynamics. According to the second law of thermodynamics, processes taking place in a closed system always tend toward a state of equilibrium. In other words,

unless energy is constantly being fed into a system, the processes in the system will tend to run down and quit. For example, if I had a bottle that was a sealed vacuum inside, and I introduced into it some molecules of gas, the gas would spread itself out evenly inside the bottle. It is virtually impossible for the molecules to retreat, for example, into one corner of the bottle and remain. This is why when you walk into a room, the air in the room never separates suddenly into oxygen at one end and nitrogen at the other. It is also why when you step into your bath you may be confident that it will be pleasantly warm instead of frozen solid at one end and boiling at the other. It is clear that life would not be possible in a world in which the second law of thermodynamics did not operate.

Now our interest in the law is what happens when it is applied to the universe as a whole. The universe is a gigantic closed system, since it is everything there is and there is nothing outside it.[23] What this seems to imply then is that, given enough time, the universe and all its processes will run down and the entire universe will slowly grind to a halt. This is known as the heat death of the universe. Once the universe reaches this state, no further change is possible. The universe is dead.

There are two possible types of heat death for the universe. If the universe is "closed," then it will die a hot death. Tinsley describes such a state:

> If the average density of matter in the universe is great enough, the mutual gravitational attraction between bodies will eventually slow the expansion to a halt. The universe will then contract and collapse into a hot fireball. There is no known physical mechanism that could reverse a catastrophic big crunch. Apparently, if the universe becomes dense enough, it is in for a hot death.[24]

If the universe is closed, it is in for a fiery death from which it will never re-emerge. But suppose, as is more

likely, the universe is "open." Tinsley describes the final state of this universe:

> If the universe has a low density, its death will be cold. It will expand forever, at a slower and "lower rate. Galaxies will turn all of their gas into stars, and the stars will burn out. Our own sun will become a cold, dead remnant, floating among the corpses of other stars in an increasingly isolated milky way.[25]

Eventually, equilibrium will prevail throughout, and the entire universe will reach its final state from which no change will occur.

Now the question that needs to be asked is this: If given enough time, the universe will reach heat death, then why is it not in a state of heat death now if it has existed forever, from eternity? If the universe did not begin to exist, then it should now be in a state of equilibrium. Its energy should be all used up. For example, I have a very loud wind-up alarm clock. If I hear that the clock is ticking --which is no problem, believe me--then I know that at some point in the recent past, it was wound up and has been running down since then. It is the same with the universe. Since it has not yet run down, this means, in the words of one baffled scientist, "In some way the universe must have been wound up."[26]

Some scientists have tried to escape this conclusion by arguing that the universe oscillates back and forth from eternity and so never reaches a final state of equilibrium. I have already observed that such a model of the universe is a physical impossibility. But suppose it were possible. The fact is that the thermodynamic properties of this model imply the very beginning of the universe that its proponents seek to avoid. For as several scientists have pointed out, each time the model universe expands it would expand a little further than before. Therefore if you traced the expansions back in time they would get smaller and smaller and smaller. Therefore, in the

words of one scientific team, "The multicycle model has an infinite future, but only a finite past."[27] As yet another writer points out, this implies that the oscillating model of the universe still requires an origin of the universe prior to the smallest cycle.[28]

Traditionally, two objections have been urged against the thermodynamic argument.[29] First, the argument does not work if the universe is infinite. I have two replies to this. (a) The universe is not, in fact, infinite. An actually spatially infinite universe would involve all the absurdities entailed in the existence of an actual infinite. But if the universe is torus-shaped, then it may be both open and finite. The objection is therefore irrelevant (b) Even if the universe were infinite, it would still come to equilibrium. As one scientist explained in a letter to me, if every finite region of the universe came to equilibrium, then the whole universe would come to equilibrium.[30] This would be true even if it had an infinite number of finite regions This is like saying that if every part of a fence is green, then the whole fence is green, even if there are an infinite number of pickets in the fence. Since every single finite region of the universe would suffer heat death, so would the whole universe. Therefore, the objection is invalid.

The second objection is that maybe the present state of the universe is just a fluctuation in an overall state of equilibrium. In other words, the present energy is sort of like just the ripple on the surface of a still pond. But this objection loses all sense of proportion. Fluctuations are so tiny, they are important only in systems where you have a few atoms. In a universe at equilibrium, fluctuations would be imperceptible.[31] A chart showing fluctuations in such a universe would be simply a straight line. Therefore, since the present universe is in disequilibrium, what are we to conclude? According to the English scientist P. C. W. Davies, the universe must have been created a finite time ago and is in the process of winding down.[32] He says the present disequilibrium cannot be

a fluctuation from a prior state of equilibrium, because prior to this creation event the universe simply did not exist. Thus, Davies concludes, even though we may not like it, we must conclude that the universe's energy "was simply 'put in' at the creation as an initial condition."[33]

Thus, we have two philosophical arguments and two scientific confirmations of the point we set out to defend: the universe began to exist. In light of these four reasons, I think we are amply justified in affirming the first alternative of our first disjunction: *the universe had a beginning.*

Was the Beginning Caused?

Having concluded that the evidence points to a beginning of the universe, let's now turn to our second set

of alternatives: the beginning of the universe was either caused or not caused. I am not going to give a lengthy defense of the point that the beginning of the universe must have been caused. I do not think I need to. For probably no one in his right mind sincerely believes that the universe could pop into existence uncaused out of nothing. Even the famous sceptic David Hume admitted that it is preposterous to think anything could come into existence without a cause.[34] This is doubly true with regard to the entire universe. As the English philosopher C. D. Broad confessed, "I cannot really believe in anything beginning to exist without being caused by something else which existed before and up to the moment when the thing in question began to exist."[35] As still another philosopher has said, "It seems quite inconceivable that our universe could have sprung from an absolute void. If there is anything we find inconceivable it is that something could arise from nothing,"[36] The old principle that "out of nothing nothing comes" is so manifestly true that a sincere denial of this point is practically impossible.

This puts the atheist on the spot. For as Anthony Kenny explains, "A proponent of (the big bang) theory, at least if he is an atheist, must believe that the matter of the universe came from nothing and by nothing."[37] That is a pretty hard pill to swallow. In terms of sheer "believability," I find it intellectually easier to believe in a God who is the cause of the universe than in the universe's popping into existence uncaused out of nothing or in the universe's having existed for infinite time without a beginning. For me these last two positions are intellectually inconceivable, and it would take more faith for me to believe in them than to believe that God exists. But at any rate, we are not dependent upon just "believability," for we have already seen that both philosophical and empirical reasoning points to a beginning for the universe, So the alternatives are only two: either the universe was caused to exist or it sprang into existence wholly uncaused

out of nothing about fifteen billion years ago. The first alternative is eminently more plausible.

It is interesting to examine the attitude of scientists toward the philosophical and theological implications of their own big bang model. It is evident that there are such implications, for as one scientist remarks, "The problem of the origin (of the universe) involves a certain metaphysical aspect which may be either appealing or revolting."[38] Unfortunately, the man of science is, as Albert Einstein once observed, "a poor philosopher,"[39] For these implications seem either to escape or not to interest most scientists. Since no empirical information is available about what preceded the big bang, scientists simply ignore the issue. Thus, Hoyle, after explaining that the big bang model cannot inform us as to where the matter came from or why the big bang occurred, comments, "It is not usual in present day cosmological discussions to seek an answer to this question; the question and its answer are taken to be outside the range of scientific discussion."[40] But while this attitude may satisfy the scientist, it can never satisfy the philosopher. For as one scientist admits, the big bang model only describes the initial conditions of the universe, but it cannot explain them.[41] As yet another astronomer concludes, "So the question 'How was the matter created in the first place?' is left unanswered."[42] Thus, science begs off answering the really ultimate question or where the universe came from. Scientific evidence points to a beginning of the universe; as rigorous scientists we may stop there and bar further inquiry, but as thinking men must we not inquire further until we come to the cause of the beginning of the universe?

Either the universe was caused to exist or it just came into existence out of nothing by nothing. Scientists refuse to discuss the question; but philosophers admit that it is impossible to believe in something's coming to exist uncaused out of nothing. Therefore, I think that an unprej-

udiced inquirer will have to agree that the beginning of the universe was caused, which is the second point we set out to prove: the universe was caused to exist.

Now this is a truly remarkable conclusion. For this means that the universe was caused to exist by something beyond it and greater than it. Think of what that means! This ought to fill us with awe, for it is no secret that the Bible begins with these words, "In the beginning God created the heavens and the earth."

Personal or Impersonal Creator?

I think there is good reason to believe that the cause of the universe is a personal creator. This is our third set of alternatives: *personal or not personal*.

The first event in the series of past events was, as we have seen, the beginning of the universe. Furthermore, we have argued that the event was caused. Now the question is: If the cause of the universe is eternal, then why isn't the universe also eternal, since it is the effect of the cause? Let me illustrate what I mean. Suppose we say the cause of water's freezing is the temperature's falling below 0 degrees. Whenever the temperature is below 0 degrees, the water is frozen. Therefore, if the temperature is always below 0 degrees, the water is always frozen. Once the cause is given, the effect must follow. So if the cause were there from eternity, the effect would also be there from eternity. If the temperature were below 0 degrees from eternity, then any water around would be frozen from eternity. But this seems to imply that if the cause of the universe existed from eternity then the universe would have to exist from eternity. And this we have seen to be false.

One might say that the cause came to exist just before the first event. But this will not work, for then the cause's coming into existence would be the first event, and we must ask all over again for its cause. But this cannot go on forever, for we have seen that a beginningless series

of events cannot exist. So there must be an absolutely first event, before which there was no change, no previous event. We have seen that this first event was caused. But the question then is: how can a first event come to exist if the cause of that event is always there? Why isn't the effect as eternal as the cause? It seems to me that there is only one way out of this dilemma. That is to say that the cause of the universe is personal and chooses to create the universe in time. In this way God could exist changelessly from eternity, but choose to create the world in time. By "choose" I do not mean God changes his mind. I mean God intends from eternity to create a world in time. Thus, the cause is eternal, but the effect is not. God chooses from eternity to create a world with a beginning;

therefore, a world with a beginning comes to exist. Hence, it seems to me that the only way a universe can come to exist is if a Personal Creator of the universe exists. And I think we are justified in calling a personal creator of the universe by the name "God."

I would just like to make a few concluding remarks on God's relationship to time. Many people say God is outside time. But this is not what the Bible says. According to James Barr in his book *Biblical Words for Time*, the Bible does not make it clear whether God is eternal in the sense that he is outside time or whether he is eternal in the sense of being everlasting throughout all time.[43] Thus, the issue must be decided philosophically. It seems to me that prior to creation God is outside time, or rather there is no time at all. For time cannot exist unless there is change. And prior to creation God would have to be changeless. Otherwise, you would get an infinite series of past events in God's life, and we have seen such an infinite series is impossible. So God would be changeless and, hence, timeless prior to creation. I think that the doctrine of the Trinity can help us to understand this. Before creation, the Father, Son, and Holy Spirit existed in a perfect and changeless love relationship. God was not lonely before creation. In the tri-unity of his own being, he had full and perfect personal relationships. So what was God doing before creation? Someone has said, "He was preparing hell for those who pry into mysteries." Not at all He was enjoying the fullness of divine personal relationships with an eternal plan for the creation and salvation of human persons. The Bible says Christ "had been chosen by God before the creation of the world, and was revealed in these last days for your sake."[44] Nor was this plan decided on several eons ago. It is an eternal plan: The Bible says, "God did this according to his eternal purpose which he achieved through Christ Jesus our Lord."[45] Why did God do this? Not because he needed us, but simply out of his grace and love.

So in my opinion, God was timeless prior to creation, and He created time along with the world. From that point on God places Himself within time so that He can interact with the world He has created. And someday God will be done with this creation. The universe will not, in fact, suffer cold death, for God will have done with it by then. The Bible says,

> You, Lord, in the beginning created the earth,
> and with your own hands you made the heavens.
> They will all disappear, but you will remain;
> they will all grow old like clothes.
> You will fold them up like a coat,
> and they will be changed like clothes.
> But you are always the same,
> and you will never grow old.[46]

We have thus concluded to a personal Creator of the universe who exists changelessly and independently prior to creation and in time subsequent to creation. This is the central idea of what theists mean by "God."

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