Theists have often claimed that God’s existence best explains the existence of our contingent universe. One famous argument (or family of arguments) offered in support of this claim is known as “the cosmological argument.” In his essay, Bruce Reichenbach presents and defends several sophisticated versions of this argument, including one of his own. Richard Gale offers some broad objections to cosmological arguments generally and then attacks Reichenbach’s version of it. Gale goes on to present his own rendition of the argument, one which purports to establish the existence of a contingent, limited being who is responsible for the existence of the universe, rather than the existence of the omnipotent, omniscient, perfectly good, and necessarily existent Being of classical theism.

**Explanation and the Cosmological Argument**

*Bruce R. Reichenbach*

Theists are in good company when they look for explanations either of the universe or of particular phenomena within it. Historians search for explanations of why Hitler invaded Russia, economists of fluctuations in the GDP, psychologists for why some teens commit suicide, and natural scientists for why Eastern songbirds have reduced breeding. Some invoke personal explanations, others natural or scientific explanations;
yet all strive for the best explanation of what exists or happens or what they experience. In what follows I will say something about the nature of explanation, discuss what in the universe needs explanation that is best provided by the activity of God, and suggest why it is that God provides the best explanation of specific things or events.

1 The Need for Explanation

Explanatory reasoning that infers God’s existence and activity has a long and distinguished career. Although Thomas Aquinas’s thirteenth-century *Summae* contain the classical Western formulations, his arguments are firmly rooted in Aristotelian physics. Aristotle held that to understand or explain why something exists as it does, one must appeal to the three principles (form, matter, privation) and the four causes. Aquinas uses this structure, especially efficient and final causes, to construct his arguments for God’s existence. For Aquinas, the existence of things in motion, of effects, and of contingent beings requires the causal activity of other things, for something must already be actual to realize another’s potency, and if what is actual is itself an effect, it too requires a causal explanation for its existence and causal efficacy (for example, as an intermediate mover). The process proceeds until we must invoke the existence of something that causes but is itself not an effect.

Subsequent Enlightenment versions of this argument gradually depart from Aristotelian physics and instead appeal to a more general principle called the Principle of Sufficient Reason, according to which “no fact can be real or existing and no statement true unless it has a sufficient reason why it should be thus and not otherwise.”\(^1\) The contingent has causes, which themselves stand in need of causal explanation. Since an explanation in terms of other things that need explanation cannot sufficiently account for the existent if the series of explanations proceeds to infinity, that which ultimately explains any contingent fact must stand outside this infinity of contingent causes; the ultimate cause must be a necessary being that “has the reason for its existence in itself.”\(^2\)

Contemporary philosophers have distinguished among versions of the Principle of Sufficient Reason. On the one hand, William Rowe questions the rational defense, intuitiveness, and necessary truth of Leibniz’s strong version of the principle, according to which all existents must have a cause of their existence.\(^3\) However, this version of the principle is stronger than the cosmological argument actually requires. On the other hand, the very weak version suggested by Richard Gale – namely, that it is possible that every fact has an explanation – is too weak to sustain the deductive cosmological argument, for since this weak version would not require an explanation for the contingent, it could at best lead to the conclusion that if the contingent has an explanation, the best explanation would be based on God’s activity.\(^4\) The cosmolog-

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2 Ibid., p. 45.
ical argument requires a moderate version of the principle, which holds that what is contingent or what comes into being requires a sufficient reason for why it exists or comes into being. The *contingent* needs an explanation because, although it exists, it could have not existed, and hence an explanation of why it exists rather than not is a reasonable demand. *What comes into existence* needs an explanation because, since things cannot bring themselves into existence or spring out of nothing, they must have a cause for their coming to be.

The moderate version of the Principle of Sufficient Reason is not derivable from more basic principles; an argument to derive it would ultimately invoke the principle itself, and hence beg the question. However, this is not to say that the principle is unjustified; its justification is located not only in the pragmatics of explanation but also in the metaphysics of contingency. When so placed in metaphysics, it is perhaps better to speak about the Principle of Causation, according to which whatever exists contingently cannot have its existence from itself but is dependent upon something else for its existence, either at the moment of its conception or continuously. Since dependency is a causal notion, contingency itself requires that the cause be sufficient to bring about the effect.

The classic argument against the necessity of the Principle of Causation is found in David Hume, who argues that “as all distinct ideas are separable from each other, and as the ideas of cause and effect are evidently distinct, ’twill be easy for us to conceive any object to be non-existent this moment, and existent the next, without conjoining to it the distinct idea of a cause or productive principle. The separation, therefore, of the idea of a cause from that of a beginning of existence, is plainly possible for the imagination; and consequently the actual separation of these objects is so far possible, that it implies no contradiction nor absurdity.” Hume’s argument is that whatever items are distinguishable can be conceived to be separate from each other. Since cause and effect are distinguishable, they can be conceived to be separate. Since whatever is conceivable is possible in reality, cause and effect are separable, and the Principle of Causation is not necessarily true. For Hume, the criterion for deciding whether two things are distinguishable is whether we can entertain separate impressions of them. Distinguishability, therefore, is an epistemic category. Separability, however, is an ontological category, meaning that one thing can exist entirely independent of the other thing. But, so understood, Hume’s critical premise that what is distinguishable is separable confuses epistemic with ontological conditions, and hence is not sound. The fact that we can have distinct impressions of things does not mean that those things are more than conceptually separable.

In sum, there are two possible grounds for the Principle of Sufficient Reason: epistemic requirements for explanation and the ontology of contingency. Since reality need not meet subjective demands, an explanation grounded in ontological considerations leads to a stronger justification than that which places explanation merely

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within the subjective demand of rational endeavors. At the same time, an ontologi-
cal grounding makes metaphysical commitments beyond those needed when ground-
ing the principle in epistemic considerations.

2 Partial and Full Explanations

Theists construct both cosmological and teleological arguments around causal expla-
nations for particular phenomena. Explanation contains two components: a descrip-
tion of what brought about the effect (the cause) and why the effect occurred. The
causal factors are independent of the effect; otherwise there is no bringing about. A
partial explanation appeals to some, often notable, causal condition that is partly
responsible for the effect. That the boy played with matches partially but satisfacto-
rily accounts for why the building burned, all things being equal (that the building
was constructed of flammable material, oxygen was present, etc.). But a partial expla-
nation, though often adequate from an epistemic or interest point of view, is inade-
quate when one wants to discover the ontology of the situation. Such requires a full
explanation, which includes a full cause (the set of causal conditions that were indi-
vidually necessary and jointly sufficient for the effect to occur) and “the reason why
the cause, under the specified conditions, had the effect that it had.”

3 Scientific Explanation and Personal Explanation

Richard Swinburne distinguishes two types of explanation, the scientific and the per-
sonal. In a scientific explanation, the causes are natural features, events, processes,
or conditions, and the “whys” are natural laws stating that events or things of a certain
sort under specified conditions bring about effects of a certain sort. In a scientific
explanation, given the causal conditions and the scientific laws operative at the time,
the effect will – or perhaps better, given quantum and chaotic indeterminacy, prob-
ably will – occur.

A personal explanation, on the other hand, provides an “explanation in terms of
the intentional action of a person.” It is appropriately invoked when scientific expla-
nations do not suffice or when the personal explanation is simpler and no explana-
tory power is lost. Yet a personal explanation provides as legitimate an explanation
as a scientific one.

Swinburne argues that personal explanations are not reducible to scientific expla-
nations. That an action results from an agent having a specific intention is not equiv-

10 The fact that often it is impossible to specify the full cause in any given case does not affect the onto-
logical requirement that there be such a full cause in order to bring about the effect.
11 Swinburne, Existence of God, p. 22.
alent to the action being brought about by a person’s brain states, for a brain state could bring about an event without the person intending to bring it about. Intention does not belong to the “what” of the explanation but to why persons act as they do. Yet, “the fact that personal explanation cannot be analyzed in terms of scientific explanation does not mean that its operation on a particular occasion cannot be given a scientific explanation.” In the case of certain phenomena, this inability to give a scientific explanation, or the unsatisfactoriness or incompleteness of such explanations, is crucial to inferring the existence and activity of God from a particular effect.

4 What Needs Theistic Explanation?

In the history of the cosmological/teleological arguments, theists have contended that a variety of things cannot satisfactorily receive their needed explanation from a fully naturalistic account. In general, theists have used two types of things in the initial premises of the cosmological argument. One is the existence of certain things – individual contingent beings, the universe, natural laws, or principles that govern events; the other, the coming to be of certain things, either the universe itself or its contents. This has led to two types of cosmological argument: arguments for a sustaining cause and arguments for an initiating cause.

With regard to the first type of argument, Thomas Aquinas held that among the things that need explanation for their existence are contingent beings, for such beings are dependent for their existence upon other beings. Richard Taylor and others argue that the universe (meaning everything that ever existed) as contingent needs explanation. William Rowe, arguing that the term “universe” refers to an abstract entity or set, rephrases the issue, “Why does that set (the universe) have the members that it does rather than some other members or none at all?” That is, “Why is there something rather than nothing?”

With regard to the second type of argument, theists focus on the coming to be of the universe or of certain of its features. William Craig, for example, in his version of the Islamic Kalam argument, argues that since whatever begins to exist must have a cause, and since the universe began to exist, the universe had a cause. Theists such as John Polkinghorne and Robert John Russell see the fundamental openness of quantum events as both evidence of and the locus for God’s activity in the world. There must be something outside the deterministic, naturalistic schema that makes a quantum cause result in a specific effect. Others argue that the genesis of life and human consciousness need explanation, and that this explanation is best provided by the existence and intervention of God. With respect to the former, how could the information chains found in RNA develop out of basic, inorganic physical elements?

12 For a fuller defense of these theses, see ibid., pp. 36–42.
13 Ibid., p. 47.
14 Rowe, Cosmological Argument, p. 136.
Once RNA sequences exist, we can understand how they combine and recombine. But prior to the existence of a processor and interpreter of such data, what reason would there be for information-neutral, physical/chemical elements to transform into information-bearing nucleotides, be preserved, and reproduce themselves? 17 With respect to human consciousness, some argue that the correlation of mental events and intentions with brain events cannot have a fully naturalistic explanation, that the development of the conceptual out of the non-conceptual and the intentional out of the non-intentional involve a qualitative change that cannot be explained merely in terms of quantitative complexity. 18

Still others note that the arrival and development of beings capable of witnessing and understanding the very conditions of their existence requires the occurrence of certain conditions that, by themselves and collectively, have an extremely low antecedent probability. 19 It is not that the existence of conscious beings is a requirement for the existence of such improbable conditions, but the fact that these extraordinarily unlikely but highly significant events occurred at all and in a way that gave rise to beings who can witness them, that requires explanation.

The danger in the versions of the theistic argument that commence from specific natural phenomena is that they smack of the appeal to a god of the gaps. The history of rational theology is fraught with examples where individuals invoke the activity of God to explain events for which scientific reasoning at the time could not account. As scientific knowledge progressed, however, explanations were forthcoming, and the invocation of God as an explanatory hypothesis was no longer necessary. If the above arguments are to avoid this troubled past, the events in question must be intrinsically, and not merely accidentally, completely inexplicable by scientific or naturalistic accounts. For example, Russell and Polkinghorne argue that it is not the case that we merely do not yet possess enough information to understand how particular effects arise from quantum causes; the indeterminacy resides in nature itself. Any quantum explanation has “intrinsic gaps.” 20 Similarly, Craig argues that it is not simply our limited knowledge that prevents us from exploring the cause of the universe at the moment of its inception at the Big Bang. For the universe to develop out of infinite density is for it to develop out of nothing, and out of nothing, nothing comes. 21

The point (and problem) here is to determine whether one has encountered an intrinsic gap in our ontology or whether the gap lies in our epistemic state. In this sense, Gale wisely warns the theist about developing arguments where the explana-

18 Swinburne, Existence of God, pp. 160–75; Smart and Haldane, Atheism and Theism, p. 117.
tion in terms of God competes with that of science. At the same time, it is not clear that explaining in terms of divine intention the origin of the Big Bang, the origin of life from nonliving physical/chemical elements, or why particular events arise out of quantum events competes with science, provided one can show ontological incongruity at these junctures. Lack of space prevents us from developing the relevant arguments here.

5 Deductive and Inductive Inferences

The classical versions of the cosmological argument, which hold that the sufficient explanation for the existence or arising of contingencies necessitates the existence and activity of God, are deductive. The conclusion that God (or a necessary being) exists follows necessarily from either the existence or arising of contingent beings (whether individual contingent beings or the universe as a whole), the invocation of the Principle of Sufficient Reason in one of its forms (e.g., Aristotelian act/potency, the Leibnizian strong version, or the Principle of Causation), and the denial that an infinity of contingent beings or causal conditions can supply the requisite sufficient explanation.

Some contemporary versions of the cosmological argument are weaker. For one thing, the claim is not that the existence of God provides the only explanation, but rather that it provides the best explanation of the things or events in question. God’s existence is simpler and has greater explanatory power. For another, theists appeal not to one particular event requiring nonnatural explanation, but rather to a variety of phenomena for which the best explanation is a personal, intelligent supernatural being. From such a cumulative case that combines cosmological and teleological arguments with religious experience, they conclude that it is probable or more likely than not that God exists, given the total data. Should some of the data find their explanation elsewhere, the argument is not significantly affected, since sufficient other data point to the theistic conclusion as the best explanation.

In what follows we first consider the approach that the existence of a necessary being (what we will term God, though one need not use that term) follows deductively from certain premises. Later we briefly explore the inductive approach, arguing that certain contingent phenomena find their best explanation in an appeal to the existence and activity of a supernatural being.

6 The Deductive Cosmological Argument from Contingency

Although the cosmological argument appears in various writers with different first premises, the fundamental structure and resulting issues are basically the same.

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24 One must carefully distinguish between the contention that x exists and what x is, although the second is related to the first in that certain properties of x are required to make the cosmological argument work. See Smart and Haldane, *Atheism and Theism*, pp. 140–8.
1 A contingent being (a being which, if it exists, can not-exist) exists.
2 This contingent being has a cause or explanation of its existence.
3 The cause or explanation of its existence is something other than the contingent being itself.
4 What causes or explains the existence of this contingent being must either be solely other contingent beings or include a non-contingent (necessary) being.
5 Contingent beings alone cannot cause or explain the existence of a contingent being.
6 Therefore, what causes or explains the existence of this contingent being must include a non-contingent (necessary) being.
7 Therefore, a necessary being (a being which, if it exists, cannot not-exist) exists.

Premises 1 and 3 seem true, although objection has been raised to 3 on the grounds that certain complex things can be explained in terms of their components. We will look at this objection shortly. Premise 2 is seen by many to follow from the moderate version of the Principles of Sufficient Reason and Causation. If something is contingent, there must be a cause of its existence or a reason why it exists rather than not-exists. Premise 4 is true by virtue of the Principle of Excluded Middle. Premises 6 and 7 follow validly from the respective premises.

For many critics, premise 5 is the key to the argument’s success or failure. Whether it is true depends upon the requirements for an adequate explanation. We have already noted that, according to the Principle of Sufficient Reason, at a minimum what is required is a full explanation – that is, an explanation that includes a full cause and the reason why the cause had the effect it did. If the contingent being in premise 1 is the universe, then a full explanation would require something beyond the contingent factors that, as part of the universe, are what are to be explained. That there has always been a magnetic field around the earth does not explain why there is a magnetic field. Similarly, that contingent or dependent things (a universe) have always existed fails to provide a sufficient reason for why the universe exists rather than not. A full explanation of the universe, then, would require the existence of a non-contingent causal condition – namely, a necessary being.

Finally, it should be noted in 7 that if the contingent being identified in 1 is the universe, the necessary being cannot provide a natural explanation for it, for no natural, non-contingent causes and laws or principles exist from which the existence of the universe follows. What remains is a personal explanation in terms of the intentional acts of some supernatural being that is eternal and a sei, properties that follow necessarily from its being essentially non-contingent.

**6.1 First objection: the universe just is**

Of the many objections to the argument, we will consider three major ones. First, over the centuries philosophers have suggested various instantiations for the contingent

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25 I include the disjunct “cause or explanation” because not all versions of the cosmological argument invoke the Principle of Sufficient Reason expressed in the Enlightenment sense. The Thomistic arguments emphasize a causal account. Since an explanation is usually (but not always) given in causal language, we will not exploit the difference.
being noted in premise 1. The Thomistic form of the argument focuses on providing a causal explanation for particular contingent beings: something in motion, something caused, and a contingent being. Others, such as Samuel Clarke, suppose that the contingent being referred to in premise 1 is the universe. Due to considerations of space, we will focus on the second of these options.26

Bertrand Russell denies that the universe needs an explanation; it just is. His argument takes two forms. In the first version, Russell contends that since we derive the concept of cause from our observation of particular things, we cannot ask about the cause of the universe, which we cannot experience. The universe is “just there, and that’s all.”27 Those who reason that we can apply the causal principle (that every contingent being requires a cause of its existence) to the universe commit the Fallacy of Composition, which mistakenly concludes that since the parts have a certain property, the whole likewise has that property. Applied to the cosmological argument, Russell contends that the move from the contingency of the elements of the universe to that of the universe is likewise fallacious. Hence, whereas we can ask for the cause of particular things, there is no reason to think we can ask for the cause of the universe or the set of all contingent beings.

Russell correctly notes that arguments of the part–whole type can commit the Fallacy of Composition. For example, the argument that since all the bricks in the wall are small, the wall is small, is fallacious. Yet sometimes the totality has the same character as the parts on account of the parts – the wall is brick because we built it out of bricks. The universe’s contingency, theists argue, resembles the second case. If all the contingent things in the universe, including matter and energy, ceased to exist simultaneously, the universe itself, as the totality of these things, would cease to exist. But if the universe can cease to exist, it is contingent and requires an explanation for its existence.28

Some reply that this argument for the contingency of the universe is still fallacious, for even if every contingent being fails to exist in some possible world, it may be the case that there is no possible world that lacks a contingent being. That is, though no being would exist in every possible world, every world would possess at least one contingent being. Rowe gives the example of a horse race. “We know that although no horse in a given horse race necessarily will be the winner, it is, nevertheless, necessary that some horse in the race will be the winner.”29

Rowe’s example fails, however, for it is possible that all the horses break a leg and none finishes the race. That is, the necessity that some horse will win follows only if there is some reason to think that some horse must finish the race. Similarly, the objection to the universe’s contingency will hold only if there is some reason to think that the existence of something is necessary. One reason given is that the existence

28 Reichenbach, Cosmological Argument, ch. 6.
29 Rowe, Cosmological Argument, p. 164.
of one contingent being may be necessary for the nonexistence of some other con-
tingent being.\textsuperscript{30}

But though the fact that something’s existence is necessary for the existence of
something else holds for certain properties (for example, the existence of siblings is
necessary for someone not to be an only child), it is doubtful that something’s exis-
tence is necessary for something else’s nonexistence \textit{per se}, which claim is needed to
support the argument denying the contingency of the universe. Hence, with no good
reason to the contrary, given the contingency of everything in the universe, it remains
that there is a possible world without any contingent beings.\textsuperscript{31}

Further, given contemporary accounts both of the origin of the universe and, in
some quarters, its probable demise, it is reasonable to think that the universe is
the sort of thing that is contingent (it could conceivably not be) and hence requires
an explanation. The very meaningfulness of the discussion mutes the view that
the universe is an abstraction, like the human race. Behind Russell’s denial of causal
predicates to the universe lies a positivism that presumes that the only meaningful
causal accounts are those that invoke natural or scientific explanations. But such
a presumption begs the question, especially if we admit personal explanations as
genuine explanations. In short, contrary to Russell, the theist commits neither a
fallacy nor a category mistake in asking for an explanation of the existence of
the universe.\textsuperscript{32}

Russell’s second version appeals to quantum physics.\textsuperscript{33} He notes that physicists find
indetermination on the subatomic level. For example, it appears that electrons can
pass out of existence at one point and then come back into existence elsewhere. One
cannot trace their intermediate existence or determine what causes them to come into
existence at one point rather than another. Their location is only statistically proba-
ble.\textsuperscript{34} Since the singular event of the Big Bang is a microscopic event on the level
where quantum principles apply, the cosmological argument cannot defend premise
2, and hence the argument fails.

\textsuperscript{30} This reason was suggested to me by James Sadowsky.

\textsuperscript{31} The theist need not establish that in fact this is the case, only that it is possible. William Rowe (Cos-
mological Argument, p. 166) develops a different argument to support the thesis that the universe must be
contingent. He argues that it is necessary that if God exists, then it is possible that no dependent beings
exist. Since it is possible that God exists, it is possible that no dependent beings exist, and hence the uni-
verse is contingent. Rowe takes the conditional as necessarily true in virtue of the concept of God. That
is, given who God is, it is up to God whether dependent beings exist or not.

\textsuperscript{32} Rowe suggests a different argument for the inapplicability of cause to the universe. “Many collections
of physical things cannot possibly be themselves \textit{concrete} entities. Think, for example, of the collection
whose members are the largest prehistoric beast, Socrates, and the Empire State Building. By any stretch
of the imagination can we view this collection as itself a concrete thing? Clearly we cannot. Such a col-
lection must be construed as an \textit{abstract} entity, a class or set” (Rowe, Cosmological Argument, p. 135).
From here Rowe reconstructs the cosmological argument to ask not why the universe exists in terms of a
cause, but why it has the members it has rather than others or none at all. But there is no reason to think
that collections of concrete entities cannot themselves be concrete objects or systems or aggregates of con-
crete objects, themselves needing an explanation for their existence. Indeed, Socrates is precisely the sort
of thing about which one can mount a causal inquiry. (Though we do not have space to develop it here,
the argument is presented cogently and clearly in Gale, On the Nature and Existence of God, pp. 248–50.)

\textsuperscript{33} See also Paul Davies, Superforce (New York: Simon and Schuster, 1984), p. 200.

\textsuperscript{34} Craig and Smith, Theism, Atheism, and Big Bang Cosmology, pp. 182, 121–3.
Given our present knowledge, it is difficult to know what to say about this argument from quantum physics. As some wag quipped, “one who claims to understand quantum physics does not understand quantum physics.” Some argue that the phenomenon of indeterminacy results from the limits of our investigative equipment. We simply are unable at this time to discern the intermediate states of the electron’s existence. According to a second view, termed “the Copenhagen interpretation” of quantum physics, the very introduction of the observer into the arena so affects what is observed that it gives the appearance that effects exist without causes. But one cannot know what is happening without introducing observers and the changes they bring. A third view is that the indeterminacy is real, but that the evidence of particles or energy coming into existence out of vacuum fluctuation is not equivalent to showing that they are uncaused. “Virtual particles do not literally come into existence spontaneously out of nothing. . . . The quantum vacuum states . . . are defined simply as local, or global, energy minima.” The microstructure of the quantum vacuum is a sea of continually forming and dissolving particles which borrow energy from the vacuum for their brief existence. . . . Thus vacuum fluctuations do not constitute an exception to the principle that whatever begins to exist has a cause.”

In each of these three explanations of quantum phenomena, premise 2 holds. A fourth view is that we have no idea what laws of physics applied in the very early stages of the universe, and hence no reason to deny that the Causal Principle applied at that stage.

At the same time, it should be recognized that showing that indeterminacy is a real feature of the world at the quantum level would have significant negative implications for the more general Causal Principle that underlies the deductive cosmological argument. Quantum accounts allow for additional speculation regarding origins and structures of universes (for example, Hawking’s theory that the finite universe has no space-time boundaries and hence, without an initial singularity, requires no cause).

### 6.2 Second objection: explaining the individual constituents is sufficient

A second objection, originally raised by David Hume, is that the whole is explained when the parts are explained. “But the whole, you say, wants a cause. I answer that the uniting of these parts into a whole . . . is performed merely by an arbitrary act of the mind, and has no influence on the nature of things. Did I show you the particular causes of each individual in a collection of twenty particles of matter, I should think it very unreasonable should you afterwards ask me what was the cause of the whole twenty. This is sufficiently explained in explaining the parts.”

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35 “The greatest paradox about quantum theory is that after more than fifty years of successful exploitation of its techniques its interpretation still remains a matter of dispute” (John Polkinghorne, *One World* (London: SPCK, 1986), p. 47).
39 David Hume, *Dialogues Concerning Natural Religion*, part IX.
On the one hand, it is not always true that the whole is sufficiently explained in explaining its parts. An explanation of the parts may provide a partial but incomplete explanation; what remains unexplained is why these parts exist rather than others, why they exist rather than not, or why the parts are arranged as they are. With respect to the latter, Gale gives the example of a heap of rocks. While a prisoner swinging a sledgehammer may explain the existence of each individual rock in the pile, it does not explain the existence of the heap assembled by another prisoner.40

However, although this shows that Hume’s principle that the whole is explained in explaining the parts is sometimes false, it does not show that it is false in the case under consideration: namely, that of the universe treated as a set rather than as an aggregate. But suppose one invokes the explanation of the parts to explain the whole. In terms of what are the parts themselves explained? Each is explained either in terms of itself or in terms of something else. The former would make them necessary beings, contrary to their contingency. If they are explained in terms of something else, the entire collection still remains unaccounted for. “When the existence of each member of a collection is explained by reference to some other member of that very same collection then it does not follow that the collection itself has an explanation. For it is one thing for there to be an explanation of the existence of each dependent being and quite another thing for there to be an explanation of why there are dependent beings at all.”41 Swinburne notes that an explanation is complete when “any attempt to go beyond the factors which we have would result in no gain of explanatory power or prior probability.”42 But explaining why something exists rather than nothing, and why it is as it is, gives additional explanatory power in explaining why a universe exists at all. Hence, to explain the parts of the universe and their particular concatenation, appeal must be made to something other than those parts.43

6.3 Third objection: the conclusion is contradictory

Some, like Immanuel Kant and, more recently, Richard Gale, object to the conclusion that a necessary being exists. They contend that when the cosmological argument concludes to the existence of a necessary being, it argues for the existence of a being whose nonexistence is absolutely inconceivable. But the only being that meets this condition is the most real or maximally excellent being, the concept that lies at the heart of the ontological argument. Accordingly, they claim, the cosmological argument presupposes the cogency of the ontological argument. But since the ontological argument is suspect, the cosmological argument that depends on it must likewise

41 Rowe, Cosmological Argument, p. 264.
42 Swinburne, Existence of God, p. 86.
43 Gale, On the Nature and Existence of God, pp. 257–8. A different kind of explanation is provided by Frank Tipler, who holds that many worlds exist, so that the universe realizes all possibilities. On this view nothing is contingent. The many-worlds view of Tipler and Withrow, however interesting, is intrinsically incapable of being confirmed.
be suspect.\textsuperscript{44} Indeed, Gale argues, since it is impossible for an unsurpassably great necessary being to exist, the conclusion of the argument is necessarily false, and the argument unsound.\textsuperscript{45}

However, the contention that the cosmological argument depends on the ontological argument is based on a confusion. The term \textit{necessary being} can be understood in different ways. Kant, like some modern defenders of the ontological argument, understands “necessary being” as having to do with logically necessary existence – that is, with existence that is logically undeniable. But this is not the sense in which “necessary being” is understood in the cosmological argument. Necessity is understood in the sense of ontological or factual necessity. A necessary being is one that \textit{if} it exists, it cannot not-exist; as self-sufficient and self-sustaining, its inability to not-exist flows from its nature. Since such a concept is not self-contradictory, the existence of a necessary being is not intrinsically impossible.

\section{7 The Deductive Cosmological Argument from Coming into Existence}

Whereas the previous rendition of the Cosmological Argument develops out of the notion of contingency, many who attempt to bridge the disciplines of religion and science focus on the need for an explanation of what comes to be in time. Craig terms this deceptively simple argument “the Kalam Cosmological Argument.”

8 Whatever begins to exist must have a cause of its existence.
9 The universe began to exist.
10 Therefore, the universe has a cause of its existence.

We have already discussed and defended 8 (in first objection above), which is a version of the Causal Principle that underlies all cosmological arguments. The truth of 9 is supported by current cosmology, according to which somewhere around 15 billion years ago the universe suddenly exploded into existence in a violent event known as the “Big Bang.” The theoretical model undergirding the Big Bang projected that if the universe had such an origin, heat radiation resulting from the event would still be observable. Confirmation of this occurred when in 1965 two scientists at Bell Laboratories, Arno Penzias and Robert Wilson, discovered the background radiation that is the remnant of this primeval, fiery explosion. Since the initial explosion, the universe has continued to expand, its galaxies speeding away from each other, as evidenced by the light from distant galaxies shifting to the red end of the color spectrum. The Hubble constant expresses the ratio of the velocity of the recession of objects to their distance from us. According to the Infinitely Expanding Universe model, the Big Bang occurred only once. Expanding from an initial singularity where the gravitational force and the

universe’s density were infinite, where space-time and the laws of physics came into existence, the universe will continue to expand at an increasing rate, ending in an uncertain future once conceived of as a cold death (the Big Freeze).

7.1 First objection: the Oscillating Universe

Some suggest that although the infinitely expanding universe resulting from a singular event is consistent with the discovered data, so is the competing Oscillating Universe model, according to which the universe is eternal, undergoing repetitive cycles of expansion and contraction. Following each big explosion, the universe expands to a certain point, whereupon the gravitational force of its component matter slows and eventually ends its expansion, collapsing it until it reaches a point of almost infinite density (the Big Crunch), whereupon it explodes and expands outward again. This process repeats indefinitely, though not necessarily in the same way or invoking the same physical laws.

Determining whether the Big Crunch model can be correct depends, in part, upon calculating the total amount of matter in the universe. For contraction still to be possible, our universe must not have passed the critical threshold beyond which the gravitational force can no longer reverse its expansion. Some scientists hold that the density of matter is now insufficient to halt the expansion of the universe. The stars have only 1 percent of the matter necessary to collapse the universe. Having passed the critical gravitational threshold, the universe will continue to expand forever. Others maintain that a great quantity of currently undetected, invisible, or dark matter exists in the universe, scattered in dust clouds within and between the galaxies, so that we have not yet passed the critical threshold beyond which contraction of the universe is possible. Pictures from the Hubble telescope have confirmed the enormity of the galactic dust and gas clouds. Not-too-distant space probes using X-ray and infrared telescopes and the Microwave Anistropy Probe will look for invisible, superheated gas and massive, but faint, brown dwarf stars. However, determining that the universe has not passed the critical threshold will not establish the truth of the Oscillating Theory. At best, these observations can falsify but not confirm that theory.46

Very recent discoveries, however, appear to have mooted the argument that requires calculating the amount of matter in the universe. Focusing on supernovas, Saul Perlmutter and several other astronomers discovered that the universe is expanding not at a constant but at an accelerating rate. Some force in the universe not only counteracts gravity but pushes the universe apart ever faster. This discovery, confirming the infinite expansion hypothesis, makes a collapse most unlikely.47

7.2 Second objection: something can come from nothing

Some theoretical physicists, such as Stephen Hawking, contend that premise 8 is false, that on what is termed the “inflationary” theory of the origin of the universe, the uni-

46 For additional empirical evidence that we have passed the critical threshold, see Craig and Smith, *Theism, Atheism, and Big Bang Cosmology*, pp. 47–56.
verse came into existence without a cause. The universe was originally a vacuum with no space-time dimensions. At this point quantum phenomena, which include the denial of the Causal Principle, came into play. This universe “found itself in an excited vacuum state,” a “ferment of quantum activity, teeming with virtual particles and full of complex interactions,”\(^{48}\) which, subject to a cosmic repulsive force, resulted in an immense increase in energy. Due to this repulsive force, the universe rapidly expanded in size. But what is the origin of this increase in energy, which eventually made possible the Big Bang? The response is that the law of conservation of energy, which now applies to our universe and holds that the total quantity of energy in the universe remains fixed despite transfer from one form to another, does not apply to the initial expansion. Cosmic repulsion caused the energy to increase from zero in the vacuum to a huge amount. This great explosion released energy, from which all matter emerged. In effect, contrary to the ancient Parmenidean Principle, out of nothing – a primeval vacuum – came everything.

But “even if the Big Bang is the result of a ‘zero-point’ fluctuation...i t  would be necessary to ask what caused this fluctuation.”\(^{49}\) We could abandon the Causal Principle, but then which appears to be more likely: that the Principle of Causation does not apply to this grand event (that the universe emerged from nothing) or that the universe resulted from the intentional act of a supernatural being? The second at the very least provides a plausible explanation of the universe’s origin, something the first does not. But it is the provision of a reasonable explanation which is the very thing at stake in the cosmological argument to the best explanation.

The Kalam version of the cosmological argument combines deductive inference with inductive reasoning in an attempt to provide the best explanation for how the universe came to be. To the inductive argument we briefly turn.

### 8 The Inductive Theistic Arguments

The inductive cosmological argument is much weaker than the deductive argument in that it appeals to the inference to the best potential explanation. In brief, it contends that a divine being provides the simplest and best explanatory account for the Big Bang. “There is no ground for supposing that matter and energy existed before [the Big Bang] and was suddenly galvanized into action... It is simpler to postulate creation \textit{ex nihilo} – divine will constituted Nature from nothingness.”\(^{50}\)

Swinburne distinguishes between two varieties of inductive arguments: those that show that the conclusion is more probable than not (what he terms a “correct P-inductive argument”) and those that further increase the probability of the conclusion (what he terms a “correct C-inductive argument”). The arguments he presents, he claims, fall into the category of C-inductive arguments, although others may want to construct a stronger case based on P-inductive arguments.

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49 Betty, with Cordell, “God and Modern Science,” p. 412.
We do not have space to follow the reasoning of the inductive argument in detail, but two aspects deserve highlighting. First, the inference to the best explanation is best understood in comparative terms. First, one selects among the possible theories those to be considered, and from this select group ultimately judges which one provides the best explanation. In effect, such an inference involves “two filters, one that selects the plausible candidates (the live options) and a second that selects from among them.”

This leads to the second and more difficult problem: namely, determination of the criteria to be used to adjudicate between competing explanations when, as in the case of the cosmological argument, exact quantitative measures of probability are not only lacking but impossible to generate. Peter Lipton suggests two criteria: likeliness and loveliness. Likeliness has to do with the explanation that is the truest; loveliness has to do with which is most explanatory or provides the most understanding. As he notes, it would appear that the former criterion would be the one to select, since we are looking for the real cause of the phenomena in question. However, to use the criterion of the truest explanation when what we are searching for is the truest explanation appears to reason in a circular fashion. We need to develop a method by which we can generate potential causes and then use experimental methods to resolve which of these is most likely to result in the effect. Though this is a reasonable procedure where experimental methods can be used, when we deal with the origin of the universe, where not only is the event itself unique, but where the laws of physics as we know them probably do not apply in the initial stages (10^-43 second), we are left to rely more heavily on the second criterion, loveliness.

Swinburne suggests four criteria for justifications which exemplify loveliness:

11. It leads us to expect (with accuracy) many and varied events which we observe.
12. What is proposed is simple. (“A theory is simple in so far as it postulates few mathematically simple laws holding between entities of an intelligible kind.”)
13. It fits with our background knowledge.
14. We would not otherwise expect to find these events – what he terms explanatory. (“A theory has explanatory power in so far as it entails or makes probable the occurrence of many diverse phenomena which are all observed to occur, and the occurrence of which is not otherwise to be expected.”

He suggests that criterion 13 does not apply in the case of the cause of the universe, for there are no “neighbouring fields of enquiry” where we investigate the cause of the universe. Indeed, he suggests that 13 reduces to criterion 12, which for him is the key to the inductive cosmological argument.

Swinburne argues that appeals to God’s intentions and actions, although not leading to specific predictions about what the world will look like, better explain

specific phenomena than other accounts. Theism, he argues, has a probability close to neither 1 nor 0. It is not close to 1, because it lacks high predictive power. As an intentional free agent, God could have created many different worlds. God is not required to create any world, let alone the best possible one.\textsuperscript{55} On the other hand, theism’s probability is not close to 0 either, for it is consistent with the kind of phenomena that we experience in the world: the existence of an ordered universe capable of being known, the existence of intentional beings, and the theory’s consonance with people’s religious experience. Swinburne concludes: “Theism does not make [certain phenomena] very probable; but nothing else makes their occurrence in the least probable, and they cry out for explanation. \textit{A priori}, theism is perhaps very unlikely, but it is far more likely than any rival supposition. Hence our phenomena are substantial evidence for the truth of theism.”\textsuperscript{56}

\section*{9 Why God Provides the Best Explanation}

But why does God provide the best or ultimate explanation in the cases we have considered? Part of the answer is that God, or the necessary being, is a being who is not only uncaused but to whom the Principle of Causation is inapplicable. On the one hand, there can be no scientific explanation of God’s existence, for there are no antecedent beings or scientific principles from which God’s existence follows. On the other hand, the Principle of Causation applies only to contingent, and not to necessary, beings. Explanation is required only of those things that are contingent – that is, those things that if they do exist, could possibly not have existed. It is not that God’s existence is logically necessary, but that if God exists, he cannot not-exist. God is both eternal and does not depend on anything for his existence. These, however, are not reasons for his existence, but his properties.

Another part of the answer is that explanation can be reasonably thought to have achieved finality when a personal explanation has been provided that appeals to the intentions of a conscious agent. One may, of course, attempt to provide a scientific account of why someone has the intentions that he or she has, but there is no requirement that such an account be supplied, let alone even be possible. We may not achieve any more explanatory value by trying to explain physically why persons intended to act as they did. However, when we claim that something happened because persons intended it and acted on their intentions, we can achieve a complete explanation of why that thing happened. \textsuperscript{57}

\textsuperscript{55} For a defense of this, see Bruce R. Reichenbach, \textit{Evil and a Good God} (New York: Fordham University Press, 1982), ch. 6.
\textsuperscript{56} Swinburne, \textit{Existence of God}, p. 290.
\textsuperscript{57} Craig unpacks this in terms of the Islamic principle of determination. “When two different states of affairs are equally possible and one results, this realization of one rather than the other must be the result of the action of a personal agent who freely chooses one rather than the other. . . . For while a mechanically operating set of necessary and sufficient conditions would either produce the effect from eternity or not at all, a personal being may freely choose to create at any time wholly apart from any distinguishing conditions of one moment from another.” This, he notes, results from the nature of the will (Craig, \textit{Kalam Cosmological Argument}, pp. 150–1).
Third, appeal to God as an intentional agent leads us to have certain expectations about the universe: that it manifests order, that it is comprehensible, that it favors the existence of beings that can comprehend it.\textsuperscript{58} The presence of these features helps to satisfy 11 above.

Swinburne and Haldane introduce a fourth feature: namely, the simplicity of God that, by its very nature, makes further explanation either impossible or makes theism the best explanation, thereby satisfying 12 above. But that leads to a whole other set of issues regarding God’s properties and the nature of simplicity, a fit subject for another time and place.\textsuperscript{59}

Much more can be said. In particular, it remains to be shown that the necessary being is the God of religion. This is not the task of the cosmological argument, but requires employment of the method of correlation, whereby the properties of the necessary being are correlated with those of the God of religion.\textsuperscript{60} But enough has been presented to indicate that the deductive and inductive cosmological arguments provide part of a cumulative justification for theistic belief.

Why Traditional Cosmological Arguments Don’t Work, and a Sketch of a New One that Does

Richard M. Gale

Bruce Reichenbach has done a masterful job of surveying traditional versions of the cosmological argument, as well as attempting to meet the standard objections to them. In addition, he has defended his own version of the argument. I will attempt to show that his argument, along with all other traditional cosmological arguments, don’t work, and then go on to sketch a new one that does.

\textsuperscript{58} “I cannot believe that our existence in this universe is a mere quirk of fate, an accident of history, an incidental blip in the great cosmic drama. Our involvement is too intimate. The physical species \textit{Homo} may count for nothing, but the existence of mind in some organism on some planet in the universe is surely a fact of fundamental significance. Through conscious beings the universe has generated self-awareness. This can be no trivial detail, no minor byproduct of mindless, purposeless forces. We are truly meant to be here” (Paul Davies, \textit{The Mind of God} (New York: Simon \& Schuster, 1992), p. 232).

\textsuperscript{59} At times it is unclear whether Swinburne is claiming the virtue of God’s simplicity or that of theism. Swinburne entitles chapter 3 of \textit{Is There a God?} “The Simplicity of God.” But a subheading is “The Simplicity of Theism.”