THE EXISTENCE OF GOD AND THE CREATION OF THE UNIVERSE

by Jack C. Carloye

Abstract. Kant argues that any argument for a transcendent God presupposes the logically flawed ontological argument. The teleological argument cannot satisfy the demands of reason for a complete explanation of the meaning and purpose of our universe without support from the cosmological argument. I avoid the assumption of a perfect being, and hence the ontological argument, in my version of the cosmological argument. The necessary being can be identified with the creator of the universe by adding analogical mental relations. The creation of the universe is then shown to reflect modern scientific cosmology as well as stories and metaphors in the Eastern and Western religious traditions and to resolve the problem of evil.

Keywords: analogical attributes; cause; contingent being; existence; extension of attributes; necessary being.

Traditionally, in prophetic religions such as Judaism, Islam, and Christianity, the term *God* has been used to refer to an individual that creates the universe for some purpose, has some special concern for humans, is worthy of worship, and can enter into contracts. In mystical religions, such as Hinduism, Buddhism, and other religions in China, as well as denominations of prophetic religions, the ultimate reality is taken to be one, absolute without distinctions. The term *God,* or some similar term, is not used except as an approximation. There is, however, a close relationship between humans and this absolute, and there is a goodness or value to the absolute. Humans, like the rest of the universe, "erupt" from the absolute, or at least appear to have done so, and the goal in life is to reunite with the absolute, to transcend the illusion of diversity. In the prophetic

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tradition, God is clearly rational, yet the emphasis on transcendence sometimes leads theologians to the conclusion that God is ineffable. God has no properties in common with the creation. There are, at best, analogies with the mental states and traits defining "persons" in humans. In the mystical traditions, these personal traits are often regarded as the best images of, or approximations to, the ineffable absolute. My purpose is to support a hypothesis about the creator of the universe, and the creation of the universe, which captures a common core of the One and God in these major religious traditions.

I will use a revised version of the cosmological argument to establish a transcendent creator. This creator must be a necessary being, and must also have analogues of mental states. The cosmological argument will have a fundamental place in my analysis. Traditionally, the teleological argument was used to infer an intelligent creator. It depended upon a special teleological order in the universe, which, it was assumed, required an intelligent being to create. I will appeal to a teleological argument to justify the attribution of motives for the creation of the universe. Hence the teleological argument, as I use it, depends upon the success of the cosmological argument but completes the cosmological argument. It adds content and fruitful extensions of the cosmological argument by interpreting the order found by science in our universe as a clue to the motives of God in the creation of the universe. These motives are then used as principles giving meaning to our lives. They define our part in the creation of the universe and in its ultimate end.

I will try to take into account some of the most important objections to the cosmological argument. Many of these go back to Kant. Kant held that the cosmological argument depends upon the ontological argument, and the latter he took to be logically flawed. It implicitly or explicitly defined God, or the necessary being, in terms of "existence," yet the latter term does not denote a genuine property. Only genuine properties can legitimately be used in the definitions of individuals (Kant 1953, 503–7). I will try to avoid any presuppositions of the ontological argument, which derive the existence of God, or the necessary being, from the definition of the word *God*. Kant also argued that no coherent description of a transcendent being could be given, nor any relation of such a being to the universe. In particular, Kant rejected the use of the causal relation to connect perceptible individuals to the transcendent being, or beings (Kant 1953, 511). An objection given by materialists, both ancient and modern, is that any hypothesis of a transcendent being is ad hoc, since anything explainable by that being can be explained as well or better by principles within the universe, or the universe itself. I will

try to explain how the transcendent being can be contrasted with other beings, and how it can be related to the universe in a fruitful explanation of the universe. Finally, objections from religious traditions and their theologians have been that the argument is too abstract to engage our emotions, or to relate God to religious experiences. I will try to show how the argument can, in fact, interpret the metaphors and experiences of religious traditions in a way that harmonizes the prophetic and mystical traditions.

Necessary and Contingent Individuals

We need to define the term *necessary being* without implicitly attributing existence to its referent. Norman Malcolm suggested that we define it conditionally (Malcolm 1963, 144). A necessary being is one which, if it exists, cannot not exist, and if it does not exist, cannot exist. In this respect, a necessary being is like a contingent being in that it may either exist or not exist. We cannot infer existence from the definition or concept of the term. The difference between the necessary being and the contingent being is that the necessary being cannot be the realization of a possibility. It could never be a mere possibility. Whatever can be identified as the realization of a possibility is contingent. Malcolm takes the term *necessary being* to denote a genuine property, even though he accepts the Kantian doctrine that *existence* does not. I will take the terms *necessary* and *contingent being* to denote different modes of existence, as does the term *possible being*. Malcolm argues that a necessary being must exist from its nature, or must not exist from its nature, and hence if its essential properties are consistent with that of being necessary, then it must exist. It could only fail to exist if its properties were inconsistent, like those of a round square. Since there is no inconsistency, he concludes that the necessary being exists. This seems to implicitly attribute existence to the nature of the necessary being, provided that its nature is consistent with itself. I will exclude the existence of the necessary being derived from its nature. That is, the identity conditions for the necessary being will not include existence. Hence the nonexistence of the necessary being is not due to its being self-contradictory (i.e., having mutually exclusive properties ascribed to it) but will be due to the absence of certain conditions which constitute its existence. These conditions will not make the existence of the necessary being contingent upon some other individual, for the necessary being cannot be caused by anything else. The order of dependence for the conditions will be that the conditions depend upon the necessary being; but

the conditions will not be constituted by the internal nature of the necessary being.

We need to explicate the term *exists,* where it means actual existence. George Berkeley took *exists* to mean *is perceived* (Berkeley 1954, 76). He meant that existence consists in being perceived, and hence that something comes to exist by being perceived. This was not consistent with his assumption that a mental substance (that is, the self and God) exists. Kant took *X exists* to mean *X can be perceived,* thus allowing *X* to exist without actually being perceived (Kant 1953, 242–43). This still excludes from existence all nonmaterial substances, as well as all transcendent noumenal substances. However, Kant seems to be on the right track in taking existence to be a condition for experience. What Berkeley and Kant are intuiting is that existence is a condition for reference. We can make this explicit in the following assumptions:

1. *X exists* is logically equivalent to *X refers to X* is logically equivalent to *X refers.*

2. *X does not exist* is logically equivalent to *X does not refer to X* is logically equivalent to *X does not refer.*

Existence, then, is identical with the conditions for reference (Carloye 1977, 176). These conditions, roughly, are that an individual is actually intuited, or is causally or spatiotemporally related, to an actually intuited individual. For the necessary being, the only option for meeting the criteria for existence is to identify the condition for reference with its causal relation to intuited objects.

The identity conditions for a necessary being cannot include ordinary properties. Such properties consist of the unity of diverse possible instantiations. The diverse possible instantiations constitute the extension of the property, while the unity (i.e., what is common to them) constitutes the intension of the property. The extension is possible because it is conceivable. It may also be actual if it satisfies the conditions for reference. An actual instance of a property is a realization of a possibility, hence it is a contingent actuality. The necessary being cannot have ordinary properties for just this reason. The identity of a necessary being consists solely in its mode of existence. Hence there can be at most only one necessary being.

Possible and Actual Universes

A universe is a set of contingent individuals related in a continuum, such as space-time, and having properties which are co-possible. We will take an actual universe to have only actually existing members. A possible universe may, or may not, have some actual mem-

bers but must have some members that are merely possible. The actual members of a possible universe must be actual in an actual universe as well as in the possible universe. If any physical relations hold between actual members of a possible universe, there must be a single actual universe in which these members are actual and have those physical relations. Physical relations hold only between actual individuals. That includes physical causal relations as well as all other physical relations. This distinguishes physical relations from mental relations, which, we will argue later, relate an individual to a universal, whether or not there are actual instances of the universal. Causal dispositions can be attributed to actual individuals, but these are not genuine relations. They are conditional relations. They are actualized only when their conditions are actualized. The latter occur primarily in actual universes, and only secondarily in possible universes which have actual members. Hence, there are no actual physical causal relations that hold between possible individuals and actual individuals. Of course possible individuals cannot be related physically to each other either. All actual effects must have actual causes, and all actual causes must have actual effects. In the case of mental causes, there is a mental relation involved as well. From these considerations, it is clear that no causal relations can hold between things in different universes, except in the secondary sense due to the fact that these individuals are related in an actual universe. Some cosmologists, such as Everett, talk as though one universe could split off into a different set of universes (Barrow and Tipler 1986, 476). Such splits can occur, but only within a given universe. No causal relation can occur at all between universes as wholes.

An example of a possible universe containing actual individual members would be a possible universe sharing some of the history of our actual universe. Some of the dispositions unrealized in our universe are "realized" in the possible universe; while those realized in ours may not be "realized" in it. Suppose that a sperm produced by George Washington's father, at the time that the George Washington sperm was produced, was potentially fertile. That alternative sperm might have united with the George Washington egg instead of the sperm that produced George. In a possible world, we can conceive of the possibility that George was not conceived, but someone else was conceived instead. That possible world would include some actual history, but it would not contain a causal relation between the possible individual and the actual father or mother, or the eggs or sperms. There would only be causal dispositions between these terms. Possible causes could hold between possible terms, and causal dispositions can hold between actual and possible terms; but

actual causal relations can hold primarily only within an actual universe. Note that even two actual things in different actual universes cannot be causally related. If they were, they would, by definition, be in one actual universe.

What identifies a universe as a kind of universe is the set of properties instantiated by the universe as a whole. These properties include the space-time patterns relating individuals, and they include the causal patterns of processes in the universe. Where these processes are physical, the causal laws will include physical causes. Unless there are nonphysical processes, the laws will be wholly physical. However, if there are mental relations, or states, included in the universe, some of the causes will be mental causes, and the processes will be described by psychophysical, or purely psychological, laws. It may be that mental causes are not described by lawlike statements but have other forms of evolution than those defined by universal statements. These processes belong to the subject matter of history rather than nature. Whether there are such patterns of processes will be discussed later. In any case, all of the causal patterns of the evolution of processes within our universe are included in the identity conditions of our universe. They can be taken as properties of the universe as a whole.

The Universe as Self-Explanatory

The necessary being has no ordinary properties. Its identity conditions consist wholly in its mode of existence, i.e., necessary being. This mode of existence differentiates the necessary being from all other individuals. It is distinguished from all contingent beings by the fact that it has no properties; and it is unique in its mode of existence, since there can be only one necessary being. If the necessary being actually exists, its existence consists in its causal relation to actual universes, including our own. These universes, if there are more than one, must include observers, since they must include some perceived, or otherwise intuited, objects. The existence of all other objects, including that of the universe as a whole, consists in the causal, or spatiotemporal, relations of those objects to observed objects. The causal relation of the necessary being to the universe as a whole is not an ordinary causal relation, or an ordinary relation of any kind. It must be taken to be an analogue relation. An analogue causal relation is like an ordinary causal relation except that one of its terms is the necessary being. In an ordinary relation, in general, if it has N terms, each term is a possible instance of that relation. For the realization of that relation, there must be a set of N individuals

identified with a set of *N* possible individuals, and realizing that set of possible individuals. If, however, the relation is an analogue relation, the necessary being is not a realization of one of the terms of that relation. It is a unique term related to the other terms, but not a member of the class defined by that relation. The analogue of an *N*-termed relation has *N-1* terms related to the necessary being. The *N-1* terms are members of a class, but the necessary being is uniquely related to that class.

The necessity of the existence of the necessary being cannot be derived from any other individual. The existence of the necessary being does not depend on any other individual to which it is causally related. All analogue causal relations relate the necessary being as cause to some other event, or state, as effect. The other terms depend for their existence on the necessary being, but not the other way around. The analogue relations, as a whole, express the mode of being of the necessary being by making explicit what the necessary being supports and what it does not support. In this sense they express the nature of the necessary being, though its nature is its mode of existence. Also evident is the fact that the necessity of the existence of the necessary being cannot be defined as due to its being a member of all possible universes. In fact, the necessary being cannot be a member of any possible universe, since by definition a universe has only contingent members. The necessity for the existence of the necessary being must be conceived as due to the condition that if it causes any actual universe, the existence of every other possible universe can be realized only by an analogue causal relation to the necessary being. In a sense, the necessity of the necessary being consists of a dispositional causal relation to every possible universe. For any possible universe, its actual existence depends upon being caused by the necessary being, provided that the necessary being exists.

Some cosmologists have argued that the universe is self-explanatory. For example Paul Davies seems to hold that the development of the universe can be explained as well, or better, by its own laws and conditions than by any transcendent cause (Davies 1983, 10, 56–57, 223, 229). He accepts the Big Bang as the beginning of the space-time continuum and argues that no cause for the universe can exist, since causes require temporal relations, and all spatial and temporal relations are included within the universe. Further, many of the properties usually attributed to God, such as mental states and actions, require time. Such mental states and causal relations without time are said to be meaningless (Davies 1983, 38–39). Davies does seem to relent on this claim and allow a "wider conception of cause"

which can be intelligibly conceived, provided that we drop the requirement that causes must precede their effects (Davies 1983, 39). Something like this could also be said for mental states and mental actions.

I have already denied that the necessary being can have any temporal relations to the universe, or any ordinary properties at all. If the universe as a whole is identified with the necessary being, exactly the same thing must be said of it. It cannot have any ordinary properties as a whole, and it can only have analogue causal relations to its contingent members. In effect, we would simply regard it as the transcendent, necessary being. This justifies us in denying that the universe as a whole is itself the necessary being. If not the necessary being, it must be contingent and have ordinary properties as a whole. These properties would include those mentioned above as identity conditions for a universe. Since the universe as a whole is contingent, it must have a cause, if there is an explanation for it. We must aim at the most coherent account of the universe that is possible. This principle of coherence requires that we eliminate brute facts in favor of explanations as far as possible. Where we have a choice of explanations we should choose the one which provides, or fits into, the most coherent explanatory system as a whole. We do not need to appeal to the principle of sufficient reason, which runs into problems with quantum mechanics. In this case, we have only one explanation that satisfies the principle of coherence, i.e., that the universe is caused by the necessary being. We could introduce intermediate contingent causes by extending the universe beyond the visible universe, which we will consider later, but the simplest explanation is to introduce the necessary being as the cause of the universe beginning with the Big Bang. The assumption that our universe is self-explanatory must be rejected.

Even though such theories about our universe must be rejected, they might be useful as suggestions for interpreting our scientific theories about the structure and properties of the universe. Davies, as we said above, accepts the Big Bang theory, at least for what he calls the "visible universe." This universe at the beginning of the Big Bang is taken to have no matter and zero energy. The zero energy claim is based on the assumption that gravity has negative energy, and it balances the positive energy. From this limiting singularity, the universe expands, creating space and time. It begins in a state of extreme heat which cools with expansion, producing matter. In Davies's version, matter and antimatter are usually balanced and their collisions convert them back into energy, but local imbalances may cause an excess of matter over antimatter (Davies 1983, 29–30).

The matter evolves into galaxies, stars, and all of the material systems. Robert Adair explains the excess of matter produced as due to an asymmetry, called the CP asymmetry, which develops sometime after the first millionth of a second of the universe. The development of the galaxies, stars, and other systems, including life and humans, is thus due to a flaw in the system (Adair 1988, 50). In this account, the singularity at the beginning of the Big Bang plays the role of creator of our universe, creating it from something very much like nothing. More accurately, though, singularities are not causes, but merely limits which depend on the universe and its causal laws. Davies suggests that this is a self-generating universe, and that this explains the universe as well as, or better than, the assumption of God.

We have already argued that this account of the universe does not explain the existence of the universe but only its development. The universe is still not a necessary being, but a contingent universe needing a cause. Davies seems to recognize this and resorts to the theory that the visible universe arose from something more fundamental. His theory is figuratively expressed as deriving our universe from a "sheet of elastic space" which develops a bubble. The bubble gradually narrows its neck until it is disconnected from the sheet and becomes our visible universe (Davies 1983, 41–43). All of the problems Davies raises against the creation theory can be brought against this model. Davies describes the process of the bubble separating itself off as a "mechanism." This seems to imply causal processes connecting the sheet to the expanding bubble. Since ordinary causal processes take time, we must suppose a temporal causal relation between the sheet and the bubble. Apparently, action through the singularity must also occur. The visible universe is in that case only a subsystem of a larger universe, and this larger universe is contingent. It has spatial and temporal relations which are properties of the sheet and bubble taken as a whole. Even if we ignore the problems arising from causal relations through the singularity, the creating universe as a whole is not self-explanatory. It needs a cause, and that cause must ultimately be the necessary being. No advantage seems to be obtained by putting this primordial sheet between the origin of the universe and the necessary being.

Wheeler's creation theory for the universe fares no better. He sometimes seems to be using the reduction of the quantum state retroactively to produce the beginning of space-time in the Big Bang (Wheeler 1977). If so, he is involved in a contradiction. He must assume that the universe, or its primordial state, is in a superpositional state evolving according to the Schrödinger equation until an

observer is produced. The observation of the universe at this time retroactively reduces the quantum state to a definite eigenstate at the beginning of the universe, and it evolves from this beginning according to the general theory of relativity and assumptions of the Big Bang theory. No system can be both in a reduced state and a superpositional state at the same place and time. Either the universe was reduced at the beginning of the Big Bang or it was not.

A more promising interpretation of Wheeler is to assume that the universe at time zero is in a reduced state, but that this reduced state depends upon an observer, at some later time, making a measurement of some holistic property of the universe. Were that observation repeatable, the universe would probably be in some other reduced state at time zero in those other instances. This view is consistent, though requiring backwards causality and reversed causal processes from a later to an earlier time. There is also a question of how to interpret any probability assignment to an unrepeatable observation made on the universe at a certain time. If we suppose these difficulties could be resolved, it is clear that the universe as a whole is still contingent and needs a causal explanation by the necessary being. Wheeler appeals to a primordial state beyond time zero, and our space-time continuum, in which the universe consists of geometrically incoherent spatial "bits" (Wheeler 1980; Davies 1983, 40). The beginning of the universe consists in these "bits" becoming coherently ordered—perhaps by some reduction theory involving backwards causality. This theory is subject to the same criticisms as the "sheet" theory. If it is causally, spatially, or temporally related to our present state of the universe, it is a single, contingent universe. It is not self-explanatory.

Finally, we must consider the "many worlds" interpretation of quantum mechanics. Its distinctive feature is that it includes the measurement process in the domain of quantum theory (Barrow 1990, 154–55). This appeals to cosmologists, because it allows quantum theory to be extended to the whole of nature. Instead of taking the wave function to describe potential, exclusive properties in a superimposed state, into one of which states the wave function collapses when measured, it takes the wave function to describe an actual state which splits into all of the alternative states when measured. These alternative states are noninteractive once they split, and the split includes a split of the observer into many observers, one in each of the split branches. Clearly, we do not have many universes, as I have defined the term, but a branching universe, each branch being causally related to the event that gave rise to the split. Indirectly, these branches are interconnected causally and

in space-time. In this interpretation, quantum mechanics is deterministic. Measurements play no special role, except that the observer splits up into different, noncommunicating observers. There is no community among these observers, and no awareness by one of any of the others. The many worlds theory is like our actual universe, described above as having many possible worlds splitting off, except that in Everett's many worlds view (Everett 1957), the branches are real, actually existing lines of evolution. Everett simply substitutes causal connections for the causal dispositions that I described.

Some cosmologists claim that in the many worlds view, every logically possible evolution of the universe will occur in some line of foliation (Barrow 1990, 155). This leads to a confusion because what is logically possible includes much more than can be contained in any universe. In fact, all of the branches conform to the same laws of nature. It is not the case that this version of the universe is a necessary being. At best, the universe is a unique instance of these laws of nature. With all of its branching, the pattern of evolution constitutes a property of the whole universe. The actual universe is a realization of a possible instantiation of that property. It is therefore contingent and hence is not self-explanatory. It needs a transcendent cause, like all of the other interpretations of quantum mechanics and general relativity theory. Any attempt to make the universe as a whole self-explanatory must fail. Any explanation of the contingent universe must appeal to a transcendent necessary being for its cause.

The Necessary Being and God

The universe depends upon the necessary being, and this dependence has been interpreted as an analogue causal relation. The necessary being exists necessarily and hence does not depend upon anything else for its existence. It is eternal, and its causal action is atemporal. If we could say no more than this, we should not call it God. On the other hand, since an eternal, necessary creator of our universe exists, nothing else could be God, since everything else depends upon the necessary being. God, however, must be worthy of worship. There must be something holy about God. To be God, the necessary being must be an analogue person. Ordinary persons have dignity, but an analogue person would surpass this dignity. Dignity is a reflection of the holy. Hence we could take the necessary being to be holy, and worthy of worship, if it were a supreme, analogue person. The cosmological argument must take one more step to justify the claim that the necessary being is an analogue person.

A person is a substance having mental states. Mental states, unlike

physical states, relate an individual to a property or a function of a property. Intentional mental relations, such as the act of conceiving, relate an individual to a concept. Concepts and propositions are abstract entities and are functions of properties. Every concept, for example, corresponds to a property by virtue of being necessarily coextensive to the property. The concept of blue applies to every individual which is blue, and to no others. It would apply to any individual if that individual were blue, but not if the individual were not blue. Abstract entities can all be analyzed as functions of properties, or as containing a function of a property as an essential element. Intentional mental states derive their intentionality from the fact that they relate an individual to the extension of a property. Hence conceiving of a glass mountain relates an individual to a possible glass mountain, whether being a glass mountain is instantiated or not. Physical relations are not intentional, because their terms must exist for the physical relation to hold.

Nonintentional mental states can also be included in our definition. Sensing, or sensation, for example, can be interpreted as a relation of an individual to the intension of a quality. Having a red sensation would be taken to be sensing redness. No red individual, such as a sense-datum, is sensed. This is one of the strengths of the interpretation, since the existence of sense data is problematic anyway. Sensing is not intentional, as are conceiving or believing, because the sensing relation is opaque to the extension of the quality. We do not experience the term of the relation as possible instances of redness, but only as what the terms have in common, i.e., the intention of redness. Other mental states can be analyzed as mixtures of one or both of these mental states along with other accompanying experiences. We can, then, assimilate all mental states to a common definition, i.e., relations of an actual individual to a universal.

Consciousness is not a mental state as we have defined mental states. It is a field within which mental states might be related. Mental states may be either conscious or unconscious. A subject only has conscious intentions, although unconscious desires, thoughts, feelings, etc., are possible. When our mental states are connected by the multitermed relation of consciousness, they are illuminated. The mind becomes aware of the terms of the conscious relation, including both the subject and the universals related by the conscious mental states. The content of consciousness are the terms of the mental states which are, in turn, the terms of the conscious relation.

Analogue mental relations can be attributed to the necessary being. The reason for doing so is to explain why universals exist. Even if the necessary being did not exist, we could still assume that

universals, i.e., possible things, have the mode of possible existence, but the mode of existence would be brute possibility. It could not be explained. With the assumption of the necessary being, we can explain possible existence as depending on an analogue relation to the necessary being. The necessary being would have to be an analogue person, for such a relation is by definition an analogue mental state. Specifically, it would be an analogue conception of the possibilities by God. In the case of God, analogue conceiving creates possibilities while ordinary conceiving, by finite minds, discovers these possibilities. Granted conceptions, we could also interpret the analogue causal relation to the world as an analogue intention, or willing. An intention is merely a conceiving of an object and responding to the conception by causing the object to be realized. The response may not be successful, in which case the intention would be frustrated, but the relation would still hold. These two additions to the necessary being make the assumption of the necessary being more fruitful. It explains not only what caused the universe, but also what caused universals, and how the universe was caused. A mental causal relation allows us to seek the motives for the creation of the universe, and hence we can bring in the teleological argument to explain more specifically the order that we find in our universe. We can now refer to the necessary being as God, and take God to be necessary, eternal, and an analogue person.

The Teleological Order

From our discussion of the nature of mental relations, it is clear that mental relations are not identical to physical relations, no matter how complex these physical relations may be. The terms of physical relations must be actually existing substances or events. Mental relations, on the other hand, include as terms merely possible substances or events. This is because they relate universals, as such, to an individual person. None of the properties used to formulate the theories of physics and chemistry have this form. They are not intentional, and they are not quasi-intentional like sensations and related mental states. Persons, then, are not a part of the domain of physics or chemistry (Carloye 1986, 187–88). (In fact, I believe that persons must be minds, that is, mental substances having only mental states, but I do not have space to argue for that here.) I take nature to be the domain of physics and chemistry. There must, then, be more to our universe than is studied in the natural sciences. This "more" I take to be the subject matter of history. History is the story of people. It may, or may not, also be the story of all, or some, of the organisms.

If some, or all, organisms are persons, then they belong to the subject matter of history, and not solely to the natural sciences. If no organisms other than humans have mental states, then the role of biology is to relate organisms to physics and chemistry by reduction, or emergent theories of physical properties. We need not decide which alternative is best at this time. For our purposes, it is enough to maintain that nature is a limited part of our universe. Culture and persons are not reducible to nature. Consequently, there are not only scientific theories, but also historical explanations. Scientific knowledge is not the whole of our knowledge about our universe. This must be reflected in our theory of creation.

It is also reflected in our theories of nature. Once we accept that nonscientific knowledge and a level of reality beyond nature exist, our preference for an interpretation of quantum mechanics is influenced. Everett's many worlds interpretation is based on the assumption that observers are a part of physical reality. Observers are in quantum states just as any other physical objects are. Hence, when an observation is made on a physical system in a Ψ state, the observer, along with the rest of the system, splits into the alternatives defined by R (the theory of the reduction of the quantum wave). This universal application of quantum mechanics is what appeals to cosmologists who prefer the many worlds interpretation. Of course, some cosmologists reject the many worlds interpretation, probably at bottom because of its messy form (with all the splitting paths of the universe that are useless for further explanation, and their noncommunicating observers that cannot report to us what they observe). These thinkers must put some limits on the scope of quantum theory. It cannot include in its domain all of nature. The most common solution is to limit quantum theory to microlevels of physical systems. The interaction between microsystems is governed by the Schrödinger equations, called the U theory by Penrose (Penrose 1989, 250).

These equations are independent of the rest of quantum mechanics, which concerns interactions between the microlevel and macrolevel, according to those who make this distinction, including Penrose. The latter equations are included in R, the theory of the reduction of the quantum wave (Penrose 1989, 250). In this view, the ordinary objects that we observe are described and explained by classical theories of physics, including general relativity and the laws of thermodynamics. At the level of atoms and below, matter is described and explained by U. The reduction processes, between the other two, changing the Ψ states to classical states, are described and explained by R. Penrose realizes that this interpretation leaves a number of

vague boundaries in his account of nature and looks to future theories to resolve these problems. He speculates about a quantum gravity theory to define the level at which the transition from microstates to macrostates occurs, and the mechanism by which it takes place (Penrose 1989, 298, 349, 367-68). He suggests that this theory will replace R and involve noncomputable processes. He believes these kinds of processes are a part of the way we think, and cannot be captured by any algorithmic process (Penrose 1989, 404, 442-49). This is all very intriguing, but it leaves unexplained how mental states can be intentional, or even quasi-intentional.

There is one other alternative that is popular with psychologists and anthropic cosmologists. That is to identify the mind with *functions* of physical systems, rather than with the physical systems themselves. This allows observations to be described as the recording of information. Presumably, the R processes are interactions between physical systems and the program, or function. This argument seems to evoke Ryle's criticism of Descarte's dualistic theory of mind, i.e., that it confuses an abstract function with a concrete physical, or nonphysical, system (Ryle 1949, 15-16). Abstractions cannot be causes or effects. They are merely levels of description. This suggestion also fails to account for the distinctive character of minds and mental states, namely intentionality. There are other objections that I detail in other places, but which I do not have the space to discuss here (Carloye 1986, 187-88).

The preferred interpretation of quantum mechanics, given my distinction between mental relations and physical relations, is the one advocated by John von Neumann and Eugene Wigner. Like Penrose, they distinguish between the evolution of physical states according to Schrödinger's equation and the evolution resulting from an observation of these processes. The first is Penrose's U theory, the second his R theory. According to von Neumann's interpretation, R is a psychophysical law resulting from the interaction of a conscious mind and a physical system. The measuring instrument is included in the physical system and governed by U. Only when the nonphysical mind is affected does R come into play. R processes are genuine processes, but there may also be experiences of phenomenal objects produced by the reduction of the quantum wave.

The second law of thermodynamics is usually interpreted as a correlation between the macrostates and microstates of nature. According to this interpretation, a macrostate is a phenomenal state. It is the way our physical environment appears to us. In natural languages, the structure of the predicates corresponds to the properties the physical world appears to instantiate. The macrostate, which

appears as the one, unified state of a natural object, corresponds to a plurality of microstates. These microstates are instances of a property corresponding to a theoretical language within which the theory is formulated. In thermodynamics they would be physical systems in a reduced state according to R. The properties would be eigenstates, corresponding to classical theoretical predicates. There are many microstates correlated with a single macrostate. The greater the number, the greater the entropy. The second law requires that a physical process in a closed system proceed from low- to high-entropy conditions. The reason is that high entropy is also high probability, assuming that all microstates are about equally as probable as each of the others. In a closed system, the processes come to a state of equilibrium, which is the maximum probability for that system. According to this interpretation, thermodynamics holds only for phenomena. It describes how things appear, not how they are. In this sense, thermodynamics is not a fundamental law of nature. Since we have defined the existence of objects as depending on the existence of an observer in some part of the universe, the laws of thermodynamics must be assumed to hold, but there must be some underlying basis for the second law of thermodynamics in the physical world.

Penrose accounts for the asymmetry described by the second law by first describing the two singularities limiting the time dimension of the universe as being different (Penrose 1989, 33). The difference is in the curvature tensor RIEMAN. At the Big Bang, the component of this tensor measuring the tidal distortion, the WEYL tensor, is equal to zero. The rest of the RIEMAN tensor, RICCI, is equal to infinity. Since RICCI = ENERGY (tensor measuring energy and momentum), the entropy of the Big Bang is very low. At the Big Crunch singularity, the tensors have the opposite quantities. There, WEYL = infinity, RICCI = zero. The RICCI tensor equals low energy and has high entropy (Penrose 1989, 337–39). Thus, the evolution of the universe must be from low to high entropy as the second law requires. Penrose does not need the R laws to account for the asymmetry of the second law. He hopes to replace R with quantum gravity theory as we mentioned above. The latter theory, however, has not yet been formulated. In my view, the singularities described by Penrose could only be assigned a value for entropy if they were in fact correlated with the phenomena due to the interaction of physical processes and an observer. Penrose requires only that physical processes have properties at the macrolevel. We have rejected any macrolevel physical states and replaced them with phenomenal states. Perhaps we could consider Wheeler's suggestion that

the universe as a whole should be regarded as a reduced state. If our universe was created in a Ψ state, it would have been governed by U processes and laws, had it not been observed at some time during its evolution. Since it was observed, it began its time evolution in the reduced state having the physical conditions required by the Big Bang at the beginning of time and the Big Crunch at the end of time. Other universes instantiating Ψ and observed under similar conditions as ours might have been reduced to alternative states with the singularities reversed. Hence, we can reject Penrose's explanation of the second law and replace it with an explanation in terms of R in quantum mechanics. The explanation given by Penrose requires the distinction between microstates and macrostates, and a quantum gravity theory. Ours would exclude these assumptions and hence could clash with the Penrose theory empirically.

Creation of the Universe

The creation of the universe takes place in three eternal acts. The first is the creation of nature, the second the creation of finite minds, and the third the reconciliation of all conflicts. The order of these acts is one of dependence. The first is independent, the second depends on the first, and the third on the other two. The order of nature is determinate, symmetrical, and linear, so far as God's act of creation is concerned. The properties are exact, and so are the classes formed by these properties. The members of a class are uniform, like those of mathematics. The laws governing processes in this act are those of quantum mechanics, the U theories at least, and general relativity in some version compatible with quantum mechanics. This order reflects an action motivated by a love of order. God chose this universe because it was the most aesthetic order of any of the possible universes within God's field of consciousness. Some of the defects in this order express the constraints imposed by the second act of creation; i.e., that the physical universe should support finite minds. For example, the flaw in the CP symmetry was required for the evolution of matter and ultimately human bodies.

The second act of creation is not a conscious, intentional act. Finite minds erupt from God's mode of being. This results in indeterminate order, not only from R processes and the second law of thermodynamics, but also from free will. The first two laws are asymmetrical as well as probabilistic, but they are still processes whose properties are precise and whose classes are uniform. Phenomena and cultural properties are vague, and the classes are based upon resemblance to paradigms or norms. Free will introduces conflicts because of the

different perspectives defined by different finite minds, and the perception by them of conflicting self-interest. These conflicts express conflict within God; the vagueness expresses the unconscious source of the act of creation. The eruption of finite minds makes explicit the inner conflicts within God and prepares God for the third act, the reconciliation of all conflicts.

The reconciliation of conflicts is a cooperative act between God and finite minds to bring the creation to completion. This view is taken from the ideas of John Hick but is not motivated by the same goals (Hick 1978, 214–15, 308–10). The free will of finite minds requires God to respect finite minds. God's efforts to complete the reconciliation of finite minds with each other and with their physical environment must be based on persuasion, education, and love, not on coercion. The physical world is designed to train finite minds to acquire the basis for their education and perfection. Natural disasters motivate humans, for example, to develop a community within which science can be developed, and technology created to cope with them. The community develops language, symbols, and art to perfect our emotions and rational abilities. As these powers grow, humans become more independent and free. God has arranged the conditions of history so that, whatever choices individuals and communities make, they lead by one path or another to a universal, rational community where all conflicts are resolved. This is the Kingdom of God.

CONCLUSION

So far, we have followed the cosmological argument to the conclusion that God is both necessary and intelligent, at least in an analogical sense. We have then used the teleological argument to establish an outline of the motives for the creation. The motives were taken to be those for rational order and reconciliation of God's inner conflicts by expressing these in the creation of the universe and then resolving them in a cooperative development of history to the Kingdom of God. We have not assumed that God is omnipotent or omniscient, but that God's will is irresistible. The evil in the world is not a problem solved by reconciling it with God's perfection. It is a necessary part of God's purpose in creating the universe. The cooperation of God and finite beings is one of mutual perfection, God's as well as that of finite minds. This view seems to be very close to prophetic religious tradition. The second act can interpret the fall from a state of perfection begun in the first act of creation. It can also interpret the stories of mystical religious traditions, both east and west. These

view creation as an emanation of finite spirits from the One, or Godhead. Illusion is introduced in that act, which must be removed in order to restore the One. The third act has been described as bringing about the Kingdom of God, in accordance with the purpose of prophetic religious traditions. We can bring it into accord with mystical traditions by adding that the attainment of the Kingdom of God allows the final reconciliation to take place: the reabsorption of all diversity. God is restored to final unity without the inner conflicts. This is also in accordance with the Big Crunch that Penrose and many other cosmologists predict. We may then have constructed a promising, fruitful, theoretical framework for understanding our universe.

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