



Cosmos and Creation

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Of the two families of theories regarding the origin and organization of the cosmos, the Big Bang proposed by George Gamow and the steady state advocated by Fred Hoyle and others, the Big Bang in one version or another seems to command the greatest attention among currently working astronomers and physicists. What is quite significant is that Big Bang cosmology presupposes unilinear or historical time and suggests the possibility of an absolute beginning with an accompanying eschatology. What is even more significant is its mood of contingency, i.e., our universe just did not have to become what it is. Because of this it appears to raise important issues for theologians. Upon closer examination, however, we shall find that they are mostly pseudo issues and that even with the staggering breadth of new scientific knowledge we today must take the same point of departure for the Christian doctrine of creation taken by our ancestors, namely, the point where the Beyond made itself known in the saving gospel.

This is an important topic because Big Bang thinking has raised anew the whole question regarding the relationship between science and religion. Could we be moving beyond previous open hostility and present detente toward anew collaboration on the doctrine of creation? Some say yes! Astronomer and religious agnostic Robert Jastrow startled the public a few years ago by arguing that “the astronomical evidence leads to a biblical view of the origin of the world.” In a moment of sardonic wit and inspired eloquence, Jastrow penned the now oft-quoted lines:

At this moment it seems as though science will never be able to raise the curtain on the mystery of creation. For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries.¹

¹Robert Jastrow, *God and the Astronomers* (New York: W. W. Norton, 1978) 116; cf. p. 14. Isaac Asimov is one of those with such faith in science that Jastrow himself comes as a bad dream. For Asimov there should be a high wall of separation between church and laboratory, because religious intuition which produced the dark ages is no match for empirical science and its triumph in our modern and enlightened age. So when the astronomers climb Jastrow's mountain, Asimov claims, it is irrelevant that the theologians are already sitting there. See his essay, “Science and the Mountain Peak,” *Skeptical Inquirer* 2 (Winter, 1980-81) 42-50. A quite different third approach is that of philosopher Stephen Toulmin, who would advocate that theologians and scientists set out together to scale the as yet unclimbed mountain. They may climb together now in our postmodern age due to increasing acceptance of the participant-observer factor in scientific research: *The Return to Cosmology* (Berkeley: University of California, 1982).

Pope Pius XII anticipated Jastrow's enthusiasm in a 1951 allocution to the Pontifical Academy of Sciences in Rome when he praised scientists for testifying to a creation in time and thereby postulating the creative work of "an all-wise God."² *Time* essayist Lance Morrow says we now have the equivalent of the Montagues and Capulets collaborating on a baby shower.³

In this article we shall ask: what should be the proper relationship between scientific cosmology and the Christian understanding of creation, especially *creatio ex nihilo*? What is needed to work on the answer is some understanding of how the ancient theologians actually climbed atop Jastrow's mountain in the first place. After an examination of the admittedly thrilling discoveries relating to Big Bang research, we shall proceed to draw a contrast between mythological and historical cosmologies. This contrast is important because it is within the framework of emerging historical consciousness that the gospel revelation occurs. It was reflection upon God's saving work—the gospel—that led the Christian theologians of antiquity to make a commitment to *creatio ex nihilo*. It is this that provides the clue for unraveling the complex entanglement between scientific and religious apprehensions of the cosmos and its meaning.

I. BIG BANG COSMOLOGY

At the simplest level Big Bang theorizing about the beginning of creation appears to be an analogy based on the explosion of an artillery shell. According to this analogy, about 15 billion years ago (plus or minus 50%) an explosion took place at a small epicenter, and the entire universe today represents fragments still flying out through space. The universe is blowing up before our eyes. We earthlings are at the moment riding away from the point of origin on a chunk of shrapnel.

In addition to this simple analogy, the last three decades of scientific research have produced startling data which have confirmed and refined considerably the theory of an expanding universe. What has been learned recently has advanced our knowledge to a time as small as 10^{-35} or perhaps even 10^{-43} second after the very onset of the bang. Furthermore, the complementary research in both astronomy and physics has led to the strong hypothesis that at the point of the bang the universe was completely simple, completely unified. Now this marks the end of the line for strictly scientific research, because astrophysicists cannot within the framework of their discipline talk about singularity or what was going on before there was any time ($t = 0$). Nevertheless, it is scientific theory itself which has brought us to this exciting end of the line.

²*Bulletin of Atomic Scientists* 8 (1952) 13ff.

³*Time* (Feb. 5, 1979) 149.

According to the Big Bang theory, our universe started out very hot and has been in the one-way process of cooling off ever since. When the temperature decreases past a certain threshold a so-called "freezing" takes place. Each freezing involves the appearance of new forms of matter and energy. At the very hot very beginning we did not have such things as molecules, atoms, or even nuclei. The things (and laws of nature that govern the things) of our universe were

produced rapidly, but gradually and unpredictably. When a volume of water freezes and expands, we know for certain that it will crack. Where it will crack cannot be predicted. What exists now is largely accidental, i.e., it is not simply the working out of principles already present at the point of origin. Let us take a brief look at this process of freezing and expanding by going backwards or bangwards in time toward the beginning.

The present era is characterized by molecules and atoms. This became possible due to a freeze at approximately the 500,000 year mark after the beginning, where for the first time the electromagnetic force permitted the binding of nuclei with passing electrons. Prior to that it was not possible. The cosmos was too hot and too dense for atoms. We had only plasma made up of simpler particles and nuclei.

Going back further, the heat prior to the three minute mark prevented the formation of nuclei, because any nucleus which happened to form would be destroyed by collisions of speeding smaller particles. At three minutes, when the temperature dropped to a mere 10 million degrees, the strong subatomic interaction force became effective, making the formation of nuclei possible.

If we ask about the freezing prior to the advent of particles, we find that at about 10^{-4} seconds into the bang these particles condensed out of the sea of still hotter quarks. There seems to be no change in the fundamental forces during the quark era. But prior to the quark era, in the period from 10^{-35} to 10^{-10} seconds, we have the electroweak era, a period in which the interactions between particles are governed by only three—not four—fundamental forces: the strong, electroweak, and gravitational interactions. Thus the 10^{-10} second freeze marks a critical transition at which the weak subatomic interactive and electromagnetic forces became distinguishable in their present form. In other words, the now distinct weak interaction and electromagnetic forces were previously unified or, perhaps better said, unborn.

If this is the case, and if we press our inquiry backwards or bangwards in time, would we arrive at a point only dreamed of by Albert Einstein, namely, the point where the four fundamental forces are unified? This is just what contemporary cosmologists are pursuing.

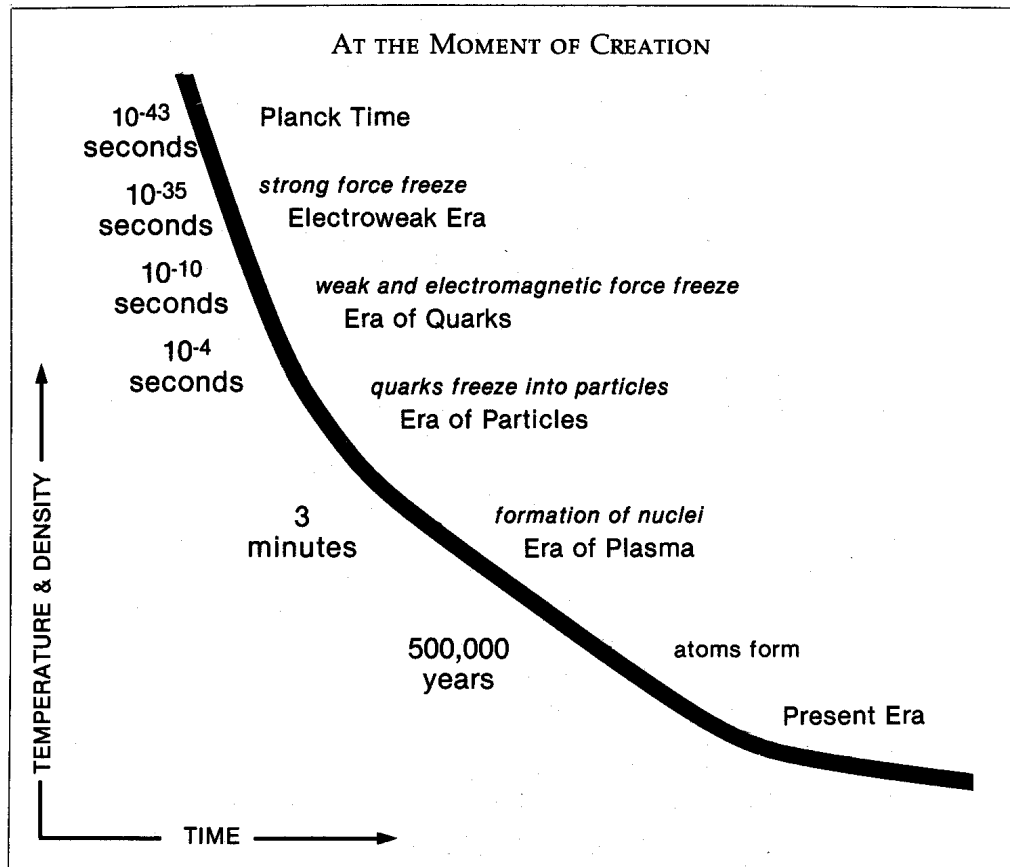
This brings us to GUT, an acronym for Grand Unified Theory. Einstein had pursued a unified field theory by attempting to reduce all four fundamental forces into one force, namely, gravity. What is happening now is that the quest for a unification theory is being sought in cosmology, in the study of past history rather than in the present state of things. Even though the four forces are at present fundamental and independent, could there have been an earlier time in which they were one?

Going even further bangwards in time, we find that before the 10^{-35} second mark the strong subatomic and electroweak forces were unified. Going

back still further to the 10^{-43} second mark and a density of 10^{90} tons per cubic inch, when the entire universe was packed into the space of an atomic nucleus, we begin what is called “Planck time” named after the German physicist, Max Planck. This marks the very first freezing, whereat the gravitational force split off from the others. What was it like before Planck time? Can we apply a grand unification theory and obtain ultimate simplicity at point zero? Here cosmology gets highly speculative because the opportunity for laboratory experimentation at such enormous temperatures is simply inconceivable. Yet the eros for the truth which drives the human intellect

leads James Trefil to write:

The first 10^{-43} second in the life of the universe would have been an extremely simple and extremely beautiful period. There would be reactions that converted bosons to fermions and vice versa, so that there would be only one kind of particle. The unification of all four forces would leave only one basic kind of interaction. The universe would therefore show the ultimate simplicity: all the particles would be of one type, and they would interact with each other through one kind of force. To a physicist, such a situation is so inherently beautiful and elegant that the idea simply has to be right. Whether nature feels the same way remains to be seen, of course.⁴



⁴James S. Trefil, *The Moment of Creation* (New York: Scribners, 1983) 156-57.

Let us pause for a moment and ask why the sought-after unified field theory would appear “inherently beautiful” to a physicist. Why is there an aesthetic, almost romantic, appeal to the notion of cosmic unity? Perhaps there is much more than just the voice of the astrophysicist speaking here. The astrophysicist has an active mind and participates in the wider intellectual tradition of which we are a part. That tradition lives. In fact, the voice of the effective history of

the western mind is whispering in our ears: find the truth! Find the one simple yet universal truth about all things! Trefil is responding to a built-in drive—Plato called it an “eros”—that is always carrying our inquiry toward the unity of truth, toward ultimate simplicity. Plato brought it to our attention by saying that everything that is composite, i.e., made up of two or more elements, necessarily finds the ground of its being outside itself; therefore, it cannot be the ultimate origin. The ultimate origin of all things must be simple. It is this that constantly drives the astrophysicist as well as the philosopher to stretch, if not go beyond the frontiers of empirically verifiable data, to theorize about the ultimate beginning, to imagine a state of comprehensive unity. To do so, however, is to knock on the door of God. But we shall return to this later.

Returning to our scheme and working our way outward from the Big Bang, the cooling matter eventually condensed and collected into galaxies, stars, and smaller units such as the planet earth. We on earth today are still riding one piece of shrapnel out and away from the point of initial explosion. But where are we going? What does the future hold?

As we indicated before, the universe is walking a one-way street from hot to cold. As if we had not paid our utility bill, our cosmic house is moving from centralized heating to decentralized freezing. Our sun is currently halfway through its expected lifespan of 10 billion years, after which it will have expended its hydrogen fuel, burst into a red giant swallowing up the earth, and then extinguished itself. Whenever a star goes through its life-cycle, it uses up a certain amount of raw material. Such material, though abundant, will not last forever. The process of star formation—which began around the 500,000 year mark—will begin to subside at about the 65 billion year mark. The stars in the Milky Way and other galaxies will begin to go out, one after the other, without new stars being born.

Now what we have been saying up to this point has assumed that we live in an open universe. There are other possibilities. Our universe may be flat or closed. Instead of expanding indefinitely it just may collapse again. What happens depends on the density of the matter in the universe. The critical point is that quantity of mass necessary to slow and stop the process of expansion. Should we have just that amount, then our universe would be called “flat.” If the density is greater than that necessary for a flat universe, then gravitational pull will draw everything back again. This we call a “closed” universe. If the density is less, then the universe will be considered “open” and it will go on expanding forever. Or, almost forever.

How much mass do we need to slow down and reverse the expansion? At least one hydrogen atom in a volume of 10 cubic feet. Do we have it? We are not certain. If we simply add up all the mass that we can see with our telescopes and compare it with the current volume of the universe/ we fall short by a factor of 10

or perhaps 100. This clearly means that we have an open universe, but it is not open by a wide margin.

But there may be mass which we cannot see. It could take the form of dead stars, interstellar dust, nonluminous gas, galactic holes, black holes, neutrinos, or ambient hydrogen atoms. Should this be the case, and should, say, 95% of the existing mass be unseen by us, then 40 or 50 billion years from now expansion will cease and contraction begin. At 80 to 100 billion years the universe will be its present size again, but shrinking. The contraction process will continue until everything is reunited again in the Big Crunch. And if the eternal oscillationists

have their way, the Big Crunch will become a Big Bounce, and everything will expand again just as it has before and will do so again unendingly. Such an oscillation theory, however, is contingent upon so many ifs as to render it peripheral to our consideration. Not only does it depend on as yet undetected mass, but barring some unforeseen change in the laws of nature everything would still walk the one-way path toward dissolution due to the second law of thermodynamics. Entropy would remain in effect. Each oscillation would bring more equilibrium into the universe so it too would eventually run down.

Therefore, let us assume that there is less than the critical mass, making the universe either flat or open. Now the future will be basically unidirectional. The further it expands, the lower will be its temperature and the more extensive its decay. The protons and neutrons that make up all matter will destabilize and disintegrate at about 10^{32} years. Solid objects will disappear. Only some extra radiation and widely separated electrons and positrons along with X-ray producing black holes will persist until 10^{65} years had passed. As the temperature continues to decrease, the black holes will give off their thermal radiation, brightening the sky temporarily until finally going out like dying embers. This process will go on until all the black holes are gone. Then there will be nothing left in the universe to produce any change. James Trefil, who spoke glowingly about the bright beginning of the cosmos, spreads a nihilistic shadow over its dark conclusion:

At some distant time in the future, the universe will be a cold, thin, expanding sea of radiation, with a few forlorn particles to break the monotony. Perhaps it was this gloomy prospect that caused Steven Weinberg to remark, "The more the universe seems comprehensible, the more it also seems pointless."⁵

Hence, according to the above theory, there is no everlasting future to intelligent living or even to the laws of nature as we know them. In the case of the closed universe everything will be destroyed in the reheating of the Big Crunch. In the case of the open universe everything will dissipate into cold inertness. Whether fried or frozen, all life will end.

II. SOME INTERESTING BUT MISLEADING THEOLOGICAL QUESTIONS

Thinking about the Beginning and in this case the End of all things cannot help but raise questions regarding God. But formulating these questions is impor-

⁵Ibid., 217.

tant. It is easy to fall into the trap of formulating them wrongly so that the pursuit of the answers leads us down paths irrelevant to the Christian doctrine of creation. Wrongly formulated questions may not produce wrong answers, but they may produce oblique answers, i.e., answers which do not help to make intelligible what Christian faith has to say about God's relation to the world.

One such oblique question would be: *how can we correlate the sequence of Big Bang events with the creation account in the first chapter of Genesis?* Although this question looks exciting at first glance, in fact it is quite misleading for three reasons. First and least, the question may assume that, with the discovery of an absolute beginning, the remaining sequence of events

in Genesis is similarly confirmable. Just a quick overview will dispel this hope, however. Whereas Genesis describes the creation of the earth on the third day—prior to that of the sun and stars on the fourth day—astronomers hold that our sun and solar system were formed together about 5 billion years ago, meaning that the sky was filled with stars and galaxies for perhaps 10 billion years prior to the creation of the earth. Whereas Genesis pictures God as resting on the sixth day—his creative work now completed—astronomers contend that new stars, perhaps with accompanying planets, are being formed now and will continue to be formed for some time yet; i.e., creation is continuing. What this means is that the biblical chronology cannot be pressed easily into the scientific chronology. Yet we may be tempted to gerrymander one or the other to make them fit. We might yield to this temptation unless we understand the other two problems with this question.

The second reason for the obliqueness of trying to correlate Genesis one with Big Bang cosmology is that it fails to apprehend the hermeneutical problem. The Priestly writer who edited, if not authored, Genesis 1:1-2:4a obviously did not have the Big Bang theory in mind during the 6th century B.C. He or she most probably was thinking about the *Enuma Elish* or some similar Mesopotamian creation myth, and the sequence of events purposely reflects this context.

Third, and most important, the Christian doctrine of creation was not originally constructed on the basis of knowledge scientific or otherwise regarding the chronology of early events. It was rather a response to hearing the gospel and the growing realization that the God who redeemed Israel from slavery in Egypt and who raised Jesus from the dead is also Lord of the universe. Unless we apprehend the basic motive behind the Christian notion of creation, the technical comparison of biblical passages with scientific scenarios will only lead us into an intellectual quicksand.

Another potentially misleading but very interesting question would be: *did God start the Big Bang in the first place and, if so, how did he do it?* Was it God who lit the fuse on the cosmic dynamite? This is an interesting question, because many of the factors important to the Christian notion of creation are present in the Big Bang theory, e.g., one-directional time, an absolute beginning, contingency, the historical advent of natural forces, and a de-divinized cosmos. It looks like Big Bang cosmology complements well our theological commitments.

This is a much better question than the first one, but there are pitfalls here too. First, even if we could ascertain through either science or intuitive insight

just how God as prime mover set everything else moving in the first place, then what have we got? If we stop here, then we end up with deism: a God who acted once, at the beginning, but since then the four forces and other laws of nature have been sovereign. This is not yet the Lord, the combination of carer and creator whom we have come to know through his saving acts within the historical process.

A second pitfall in a prematurely theologized Big Bang cosmology is that what we gain on the front end we lose on the back end. Yes, we may gain a God who creates from a point of absolute beginning. But what about the future? An eschaton wherein the entire universe becomes totally dissipated into an energyless and matterless plenitude is hardly the salvation proclaimed by Scripture. We shall return to this problem later.

What makes these questions misleading is their common assumption that we can start to develop a doctrine of creation from reflection upon strictly intracosmic experience. Scientists are very aware of the limits—often stringently self-imposed limits—which their method places on the kind of knowledge produced by their research. It is knowledge about the cosmos gained from the cosmos. For example, they do not allow themselves to speak to the question: what happened before the beginning? To do so, of course, would be to press the beginning back a further step and simply enlarge the temporal span of the cosmos of which we are a part. Then a new beginning would appear, i.e., a new frontier that marks the end of finite knowing.

Modern astrophysicists are not the only ones to impose such limits on inquiry. Ancient theologians did too. Irenaeus, in affirming that God holds supremacy over all the creation, adds: “But whence or in what way He produced it, neither has Scripture anywhere declared; nor does it become us,...in accordance with our own opinions, to form endless conjectures.”⁶ Augustine agrees. To the question, “What did God do before he made heaven and earth?” Augustine refuses to joke and hurt someone’s feelings by answering with the insulting remark: “He was preparing hell for those prying into such deep subjects.” Nevertheless, Augustine acknowledges that this subject lies beyond the possibility of human knowing. “I do not know,” is all he can say.⁷ The problem with this whole line of inquiry is that it detours us from what is important about the cosmos understood as God’s creation, namely, creation’s contingency and God’s sovereignty.

The point of departure for Christian thinking about the creation—in fact the point of departure for even conceiving of the term “creation” as describing something created by a creator in the first place—is an experience with that which is beyond the creation. It begins with a revelation from a source outside the cosmos. It begins with the gospel of salvation.

I wish to emphasize that it begins here. It does not end here. What Christians have to say about creation does not spring full-blown from the head of Zeus, Hermes, Moses, Gabriel, or any other divine spokesperson. It is not the report of an intuition. It is rather a construction, an explication, a drawing out of

⁶Irenaeus, *Against the Heresies*, 11.28.7.

⁷Augustine, *Confessions*, Book 11, Chap. 12.

cosmological implications inherent in the experience of the gospel and the salvation which it proclaims. It has grown and continues to grow in a circuitous and perhaps unpredictable way.

Retrieving the pattern of this growth toward the Christian understanding of creation is not easy, but we are trying to do so here. It is our argument that the primary human experience with the world leads to the mythological articulation of a closed cosmos, wherein the power and form of being are determined by the past and wherein the divine is thought to be contained within the cosmos as one factor among others. As human consciousness begins to differentiate and historical thinking begins to take root, the notion of an absolute beginning to things makes its appearance and the result is historiogenesis, i.e., a historical account of the origin of the cosmos. The experience of transcendence, what we shall here call “the Beyond,” precipitates still further reflection on the Beginning which leads eventually to the notion of creation out of nothing. The decisive factor producing the Christian notion of creation is the experience of salvation due to the power of the Beyond proclaimed by the prophets and confirmed in the Easter resurrection of

Jesus. The power of the eschatological new means that the creation was originally something new too. It also means that the God who raised Jesus is the Lord of the universe.

Such affirmations cannot be considered as simply the result of intracosmic reflection, whether mythological or scientific. They represent a complex pattern of inferences based upon a revelation from the Beyond and a commitment that can only be described as faith.

III. THE ARCHONIC EXPERIENCE OF THE COSMOS: MYTH

There are two basic ways of conceiving the origin and nature of the universe, the *archonic* and the *epigenetic*. According to the archonic view everything is, in one way or another, given at the beginning. So named because of the Greek root *arche*, which means both beginning as well as governance, this view assumes that the nature of things is defined and fixed by its origin. If we can find the origin of something, we shall have found its essence. According to the epigenetic view, in contrast, a certain minimum is assumed as given in the beginning, but over time new things occur. Theories of evolutionary development and continuous creation are epigenetic in character.

The primary experience of the cosmos as articulated in myth and the first stage of historical consciousness is clearly archonic. Let us define “cosmogonic myth” as a story telling how the gods created the world in the beginning, *in illo tempore*, which explains why things are the way they are today. Such thinking seems to presuppose that reality and power are inextricably linked to the past, to the origin, to the beginning. Thus, to be able to return to the beginning would be to recapture the ruling or governing power of things and thereby to ward off the insecurity caused by the threats of chaos, violence, and death. Myth helps us to do just this. Through its telling and ritual reenactment the myth collapses time by drawing together past and present, creation and providence.

Now we may ask: is Big Bang cosmology in any sense mythical? Mary Hesse believes so. She makes the ironic point that “for the general public in edu-

cated Western society, scientific accounts of the origin and destiny of the world, and of the status of human beings in it, have replaced the traditional mythical accounts given in various forms in all religions.” She says evidence that science functions as a myth “can be seen in the way ‘origins’ are taught in schools.”⁸ Now no doubt the question of origins is central, but there are at least two significant elements in the mode of scientific thinking that distinguishes it from myth. First, the Big Bang theory is not archonic. It is epigenetic. The theory contends that the original simplicity at $t = 0$ differentiated into four forces and atomic units in contingent and unpredictable fashion. The archetype was not fixed at the beginning. Second, astrophysics today has incorporated a sense of history and the assumption of unidirectional temporality. Contemporary science is so imbued with historical consciousness that it does not seek to collapse the originary time and present time as ancient myth once did. It is to the rise of this historical sense of origin that we now turn.

IV. HISTORIOGENESIS: THE BEYOND AND THE BEGINNING

With the term “historiogenesis” we refer to the form of cosmological thinking that proffers a unilinear construction of history which begins with an absolute origin and leads up to

the historian's present. Historical thinking differs from mythical thinking in that it places events on a line of irreversible time where the past is singular and irrecoverable. It remains past forever. Furthermore, it eventually gives rise to future consciousness so that the cosmos may be opened up to possibilities for new realities beyond its past inventory, for epigenesis. In its initial stages of differentiation, however, the historical understanding of the cosmos overlaps considerably with the mythical, and even today it is still struggling to free itself from the closed cosmos of the primary experience.

Thus, there are two stages in the development of historiogenesis. We refer here to stage one, using Eric Voegelin's term "historiomachy," describing how a myth-like story is told according to which the gods, when creating the cosmos in the first place, designated a certain dynasty of kings to rule in their stead. History here is one-directional and events are not repeated, but the archonic structure is still intact. What the gods decreed at the beginning still holds today and will hold in the future. This historiomachic sense is reflected in the Sumerian king list of 2000 B.C., Egyptian royal myths, and in the Bible with its genealogies of Genesis and Luke 3.

What interests us here in this study, however, is a later development, namely, prophetic history. This is the more profound form of historical consciousness and it is prompted by an experience with what Eric Voegelin calls "the Beyond," i.e., with a radically transcendent reality. A translation of the Greek *epekeina*, the Beyond is the ultimate and in itself indefinable reality which surpasses all categories of intracosmic understanding. Though indefinable and transcendent, it is not absent. It calls, and something within the human soul mumbles an answer. We know about the Beyond only through revelation. This revelation comes not through the objects of the world around us but through a

⁸Mary Hesse, "Cosmology as Myth," *Cosmology and Theology*, ed. David Tracy and Nicholas Lash (New York: Seabury; Edinburgh: T. & T. Clark, 1983) 51.

secret restlessness within the psyche. Such restlessness follows upon an experience of pneumatic ecstasy, prophetic oracle, or inspired insight.

In the tension of human existence the Beyond is the pole of perfection for which the human soul longs. It is that which, in Mircea Eliade's terms, can ultimately quench our thirst for ultimate being. In seeking to quench our thirst with a reality beyond our world, our naive bond with the world is broken. The self becomes more individuated and distinguishable as it orients itself to extracosmic reality.

What is significant for our discussion of cosmology is that the revelatory experience of the Beyond raises questions regarding the beginning. The awareness of transcendent reality prompts new questioning regarding the meaning of life, the structure of the cosmos, the dependent or contingent nature of our world. And it raises the big question: what is the source of all that is? A historical cosmology is the result of this experience and these questions coming to symbolic articulation. Voegelin describes the movement:

Though the divine reality is one, its presence is experienced in the two modes of the Beyond and the Beginning. The Beyond is present in the immediate experience of movements in the psyche, while the presence of the divine Beginning is mediated through the experience of the existence and intelligible

structure of things in the cosmos. The two models require two different types of language for their adequate expression. The immediate presence in the movements of the soul requires the revelatory language of consciousness. This is the language of seeking, searching, and questioning, of ignorance and knowledge concerning the divine ground, of futility, absurdity, anxiety, and alienation of existence, of being moved to seek and question, of being drawn toward the ground, of turning around, of return, illumination, and rebirth. The presence mediated by the existence and order of things in the cosmos requires the mythical language of a creator-god or Demiurge, of a divine force that creates, sustains, and preserves the order of things.⁹

Thus, stories of creator gods which establish a reality separate from themselves—the reality we presently experience as history—describe the Beginning in response to an experience with the Beyond. For Plato writing in the *Timaeus* the creator god was the demiurge; but, contra Voegelin's interpretation, most scholars including Mircea Eliade understand the *Timaeus* as prototypical of mythical thinking, not history.¹⁰ In the case of Israel, however, we have a better example of genuine historical consciousness. The Beyond in Israel was understood as the author of a salvation history. Voegelin is correct in pointing out how this experience of salvation raised questions regarding the very beginning of things. Eventually in Israel the beginning of that salvation history and the beginning of the world came to be thought of as the same. This conjecture became the first step leading ineluctably down the road toward what would later become the Christian concept of *creatio ex nihilo*.

⁹Eric Voegelin, *The Ecumenic Age*, Vol. IV of *Order and History* (Baton Rouge: Louisiana State University, 1974) 17-18.

¹⁰Mircea Eliade, *Cosmos and History: The Myth of the Eternal Return* (New York: Harper, 1959) 9, 34, 120ff.

It was in the burning bush that the Beyond made its presence known in the soul of Moses. The Beyond was responding to the cry of anguish rising up to heaven from the muffled voices of oppressed slaves in Egypt, the land in which allegedly the gods had ordained the Pharaoh to rule. It was through an act of salvation, the Exodus from Egypt, that the Beyond made itself known to the Hebrew people. What we have in the Hexateuch is the recitation of a salvation history, the remembering of events within time—not remembering the origination of the world—whereby Israel was created and established as a nation in Canaan. The core of historical consciousness is found in the credos, the brief summaries of the divine actions and events that brought Israel into existence:

A wandering Aramean was my father; and he went down into Egypt and sojourned there, few in number; and there he became a nation, great, mighty, and populous. And the Egyptians treated us harshly, and afflicted us, and laid upon us hard bondage. Then we cried to the Lord the God of our fathers, and the Lord heard our voice, and saw our affliction, our toil, and our oppression; and the Lord brought us out of Egypt with a mighty hand and an outstretched arm, with great

terror, with signs and wonders; and he brought us into this place and gave us this land flowing with milk and honey. (Deut 26:5-9)

Gerhard von Rad argues that this confessional statement represents the earliest form of Hebrew self-understanding and identity. The rest of the Hexateuch is built up around this. Note how the credo depicts the creation of Israel but not the creation of the world. Thinking about cosmic creation comes later, probably first with the Jahwist and the dawn of kingship in Israel about the eleventh century B.C., followed by deuterio-Isaiah and the Priestly writer in later periods. No doubt for many of those centuries the picture of the cosmos in the minds of the Hebrews was basically the same as that of their non-Hebrew myth-oriented neighbors. They shared the generic genesis common to the Near East. Only as the significance of God's saving acts began to sink in and implications to be drawn out did the Hebrews begin to develop their own particular creation theology. And what they had to say about creation would be an extension of their experience of redemption. Gerhard von Rad observes,

Probably the sole reason for the lateness of the emergence of a doctrine of creation was that it took Israel a fairly long time to bring the older beliefs which she actually already possessed about it into proper theological relationship with the tradition which was her very own, that is with what she believed about the saving acts done by Jahweh in history. In the old cultic Credo there was nothing about creation. And Israel only discovered the correct theological relationship of the two when she learned to see Creation too as connected theologically with the saving history.¹¹

In Isaiah 44:24 we find a clear parallel between God the redeemer and God the creator. Psalm 136 opens by offering praise to the creator who "made the heavens" and who "spread out the earth upon the waters" before making "the sun to rule over the day" and "the moon and stars to rule over the night." It then follows with the story of the Exodus and God who "with a strong hand and

¹¹Gerhard von Rad, *Old Testament Theology* (2 Vols.: New York: Harper, 1957-65) 1.136.

an outstretched arm...divided the Red Sea" and "overthrew Pharaoh" to "rescue us from our foes." Thus, creation, though added later, became the first chapter in God's story of salvation.

This move from salvation to creation is key to understanding the prophets, especially when they introduce a new and dynamic element into historical consciousness, namely, eschatology. With the prophets the future begins to take precedence over the past. The sins of Israel, the violation of the covenant and the refusal to repent, bring the previous history of Jahweh with his people to an end. Jahweh is about to start something new: a new Exodus, a new covenant, a new Moses. Jahweh is about to act in a fashion that will be understandable in light of the old history, but his future saving acts will be even more splendid.

Von Rad calls this "eschatology." It is not eschatology in the more recent sense of positing a final end to all things. At this early stage of differentiation in Hebrew consciousness it represents a shift from past-dependence to future-dependence, even though the future is thought

to be an open future. In the prophetic message we are drawn toward a “break which goes so deep that the new state beyond it cannot be understood as the continuation of what went before.”¹² The significance of this is that reality is not dependent upon its past. It is cut free from the principles established at the point of origin. All ties with the mythically conceived cosmos are finally severed. The God of our future salvation—the God beyond the present state of reality—is not dependent upon what already exists. Therefore, salvation is itself an act of creation.

This thinking does not fit neatly into either archonic or epigenetic categories, although it is much closer to the latter than the former. When we extrapolate from eschatology backwards toward the point of origin, then, we begin to think of the Beginning as the advent of something absolutely new, as creation from nothing. It is not just the making of order out of a pre-existing chaos. Certainly this was the assumption of the author of 2 Maccabees 7:28, who emphasizes that God did not create heaven and earth out of anything that already existed, and of St. Paul, who describes God as calling “into existence the things that do not exist” (Rom 4:17b).

V. THE GOSPEL AND CREATION

The movement from salvation to creation as the form in which the Hebrews move from the Beyond to the Beginning repeats itself in the Christian understanding of the gospel. Here it is the experienced power of new life in the Easter resurrection that provides the foundation for our faith and trust in God to fulfill his promise to establish a new creation in the future. What does it take to raise the dead? What does it take to consummate history into a new and everlasting kingdom? It takes mastery over the created order. It takes a loving Father who cares but who is also creator whose power is undisputed and unrivaled.

The gospel begins with the story of Jesus told with its significance. Its significance is that in this historical person, Jesus Christ, the eternal God who is the creator of all things has acted in the course of temporal events to bring salvation

¹²Ibid., 2.115.

to all the things he has created. Salvation consists here in the forgiveness of sins and the promise of a final redemption from evil to be attained through the eschatological resurrection of the dead. The logic here is: the God who saves must also be the God who creates. Nothing less will do.

The promise of St. Paul in Romans 8 that nothing can separate us from the love of God depends upon the belief that all powers in nature and history are subject to the saving will. Only the creator of all can make such a promise. Martin Luther says it dramatically:

Since He is able out of a droplet of water to create sun and moon, could He not also defend my body against enemies and Satan or, after it has been placed in the grave, revive it for a new life? Therefore we must take note of God's power that we may be completely without doubt about the things which God promises in His Word. Here full assurance is given concerning all His promises; nothing is either so difficult or so impossible that He could not bring it about by his Word.¹³

The primary experience is with the good news of the gospel and with the assurance that it brings. Evangelical explication leads to commitments about the creation which are implied in the gospel.

The heart of the Apostles' and Nicene creeds is the gospel, the second article wherein the account of Jesus Christ is given. But in each case it is preceded by a preamble, the first article about the creator: "I believe in God the father Almighty, maker of heaven and earth." That the creator is both a loving parent and almighty is implied by the gospel. Langdon Gilkey contends that the identity of God the Creator and God the Redeemer, of the almighty power of existence with the love of Christ, is the theological axis of the Gospel of good news:

The idea of creation provides, therefore, the only framework in which the Christian Gospel can be preached effectively and believed intelligibly. The knowledge of God that we have in historical revelation is, it is true, the sole basis for our understanding of the purpose and meaning of creation. But the God revealed there as our Lord and Savior is inescapably He who infinitely transcends His creation in power and glory, and so who must be understood, not only as a personal Father, but also as the self-existent ground of all being.¹⁴

VI. CREATIO EX NIHILO AND CHRISTIAN APOLOGETICS

If we put together what we have so far—one way unilinear time, the move from the Beyond to the Beginning, the historical character of divine activity, the eschatological power of creating new things, and the gospel of salvation—we have the latent ingredients for the idea of an absolute beginning and the doctrine of *creatio ex nihilo*. What actualizes this latent doctrine is the challenge of an alternative viewpoint, especially the belief that the material of the universe has

¹³Martin Luther, *Lectures on Genesis, Luther's Works* (55 vols.; St. Louis: Concordia; Philadelphia: Fortress, 1955-76) 1.49.

¹⁴Langdon Gilkey, *Maker of Heaven and Earth* (Garden City: Doubleday, 1959) 285.

always existed. This challenge came from two competitors to the Christian view in the early centuries of the church, from dualism and pantheism.

The essence of dualism is the belief that God or the gods create the cosmos by ordering pre-existing matter—the word "cosmos" means order. This is dualistic because it posits two or more equally fundamental or eternal principles, the world as well as the divine. The essence of pantheism (or monism) is that everything is fundamentally identical with the divine. But by identifying God and the world, pantheism collapses all the plurality and multiplicity of the cosmos into a unity and this finally denies the independent reality of the world and its history.

In response to dualism and pantheism the early Christian thinkers proffer the concept of *creatio ex nihilo*. Against the dualists, this means that God is the sole source of all finite existence, of matter as well as form. There is no preexisting matter co-eternal with and separate from the divine. If the God of salvation is truly the Lord of all, then he must also be the source of all. Theophilus of Antioch in the middle of the second century, for example, praises Plato for acknowledging that God is uncreated. But then he criticizes Plato for averring that matter is coeval with God, because that would make matter equal to God. "But the power of God is manifested in this, that out of things that are not He makes whatever He pleases."¹⁵

Against the pantheists, Christians hold that the world is not divine. It is a creation,

brought into existence by God but something separate from and over against God. The world is not equa-eternal with God, because it has an absolute beginning and is distinct from God. Irenaeus puts it this way:

But the things established are distinct from Him who has established them, and what have been made from Him who has made them. For He is Himself uncreated, both without beginning and end, and lacking nothing. He is Himself sufficient for this very thing, existence; but the things which have been made by Him have received a beginning....He indeed who made all things can alone, together with His Word, properly be termed God and Lord; but the things which have been made cannot have this term applied to them, neither should they justly assume that appellation which belongs to the Creator.¹⁶

Creator and created are not the same thing. Nor can we have only one thing, God, and make everything else a misinterpreted illusion. Finite reality is not an illusory course of events to be penetrated by depth analysis to a mystical core of timeless divine unity. History is the real arena of give and take between God and those whom God loves.

Thus the arguments in behalf of the Christian doctrine of *creatio ex nihilo* do not originate nor depend strictly upon an exegesis of Genesis 1:1-2:4a or a word study on the Priestly writer's use of the term *bara*. Even if one were to acknowledge the exegetical ambiguity of phrases such as "In the beginning God created" (RSV) versus "When God began to create" (Moffat) or God's Spirit

¹⁵Theophilus, *Autolytus*, II.4; cf. *Shepherd of Hennas*, II.1; Tatian, *Address to the Greeks*, V; Irenaeus, *Against the Heresies*, II.10.4; Justin Martyr, *First Apology* 1.59; Origin, *On First Principles*, I.iii.3; II.i.4.

¹⁶Irenaeus, *Against Heresies*, III.X.3; cf. L. Gilkey, *Maker of Heaven and Earth*, 44-66.

moving "over the face of the waters" (are these pre-existent waters?), the weight of the argument for a creation with an absolute beginning rests upon more wide ranging theological concerns. Specifically, it rests upon the process of evangelical explication, i.e., of drawing out implications based on our apprehension of the saving message of the gospel. Eschatology and the promise of new things—such as a new creation—seem to warrant worship of a Lord against which there is no rival yet over against which stands a created order.

VII. CREATIO EX NIHILO AND THE BIG BANG

What is clearly attractive about Big Bang cosmology is the prospect of identifying a datable beginning to all things followed by a temporally irreversible (perhaps even historical) sequence of events and, most importantly, a sense of contingency. There is no archonic principle of necessity built in at the beginning. The world does not have to be the way it is. It could have been otherwise. It may even be different in the future. Thus with our commitment to *creatio ex nihilo* there will be a great temptation to embrace Big Bang thinking wholeheartedly, perhaps even to baptize it theologically. Our analysis of the rise of the Christian concept of creation, however, ought to help us in locating three cautions.

First, although Big Bangism may be the dominant theory at the moment, it is not the only

one. Eternal oscillationists among others employ the same data yet deny the notion of an absolute beginning. The oscillationist theory has potential theological significance because it tends toward a position comparable to Greco-Roman dualism, wherein the material substance of the cosmos is eternal. Even if the form—in our case the form would correspond roughly to the laws of nature, the fundamental forces, etc.—were to change after each Big Bounce, the stuff of the universe would have no absolute arrival nor would it ever go away. Although Big Bang with its open universe is currently out in front, eternal oscillation is still in the race and we do not even know if we are in the home stretch yet. We do not even know what would count as the finish line, because science is in principle a never-ending mode of inquiry. To place our bet on the current leader in the scientific field seems like a risky way to pursue theology.

Second, the apparent absoluteness of Big Bang's absolute beginning may be less absolute than it looks. It appears to be an ontological absoluteness. It in fact may be only a methodological absoluteness. What we have confronted with Planck time is the frontier of our knowledge, the current limit beyond which we cannot go with the present theory. To press beyond Planck time would require a super-unification conceptuality which would include among other things a quantum mechanical theory of gravitation. No such theory exists at the present time. But, as one might assume, an intense effort is well underway to find one. Should such a theory be found, we would move the frontier of knowledge further back.

Another way to look at this is to suggest that the question regarding the very origin of the universe simply cannot be answered within the scientific method. Scientific laws are based on observation and experiment. Yet we have no experience whatsoever with a universe that does not contain mass. Time

began when mass was created. To ask what happened before the beginning or what precipitated the beginning is meaningless. Science is admittedly an intracosmic inquiry. And any further advance in scientific knowledge will simply advance our intracosmic knowledge.

Our religious commitment, however, is of a different order. It begins with an experience with the Beyond, with that which transcends the cosmos. What is relevant about the Beyond is that it is the source and Lord of all that is. But because it transcends the cosmos it must remain shrouded in mystery, not subject to intracosmic modes of comprehension. This is an ontological commitment of great import, because we are affirming the divine ground for all reality. The scientific method cannot deny the relevance of the Beyond; but it cannot affirm it either. The Beyond is just what the word implies, namely, something beyond the domain of inquiry. The Beyond lies outside the perimeter of scientific knowing, and always will. Consequently, no matter how much the Big Bang theory complements *creatio ex nihilo*, it represents a methodological frontier and not the full ontological affirmation made by Christian theology. This should lead us to observe the caution expressed by Notre Dame philosopher of science, Ernan McMullin:

What one could say...is that if the universe began in time through the act of a Creator, from our vantage point it would look something like the Big Bang that cosmologists are talking about. What one cannot say is, first, that the Christian doctrine of creation "supports" the Big Bang model, or, second, that the Big Bang

model “supports” the Christian doctrine of creation.¹⁷

This is just a caution, however; it is not a hands-off policy. Theology may begin with an experience with the Beyond, but it does not end there. It seeks to explicate this experience in terms of the scientific knowledge available.

Third, let us pick up a discussion introduced earlier. The significance of the power of God as it is ascertained in Christian faith is associated with the future and not with the past. The ground for asserting the radical newness of the beginning in *creatio ex nihilo* is the promise of the new reality which is yet to come. Jesus’ resurrection from the dead is a foretaste of the eschatological reign of God which will be resurrected from the death of the present aeon. God’s future action is not just one more expression of natural laws first formed during the Big Bang of the past. He acts independently, and it is this independence which is the ground of our hope.

Here the Big Bang cosmology with its open universe does not directly complement the Christian apperception. If we bring existential questions to its forecast about a long process of winding down toward a cold dark nothingness, the whole cosmic reality begins to appear pointless and we drop into the deep funk of nihilism. “However far ahead may be the demise of life in the cosmos, the fact of its inevitability undermines any intelligible grounds for hope being

¹⁷Ernan McMullin, “How Should Cosmology Relate to Theology?” *The Sciences and Theology in the Twentieth Century*, ed. A. R. Peacocke (Notre Dame: University of Notre Dame, 1981) 39. Ian Barbour would follow this track even further, suggesting that the Christian need not even favor the Big Bang over the steady state theory which precludes an absolute beginning: *Issues in Science and Religion* (New York: Harper, 1966) 368.

generated from within the purely scientific prospect itself,” writes A. R. Peacocke. “The Revelation of John is but a pale document compared with these modern scientific apocalypses!”¹⁸

We must admit that the intracosmic discoveries of science may not buttress our hope for a transformed reality and the bright new eternal day of the Lord. This is because our hope is a response to a revelation from the Beyond, from that *a se* God whose plans for the future are not fully governed by principles or processes produced in the past. Our hope, in short, is the result of our faith.

And we should not by any means underestimate the severity of this faith commitment. It flies in the face of widely accepted intracosmic knowledge and its corresponding nihilism. Bertrand Russell laid down the gauntlet some decades ago in his “A Free Man’s Worship”:

All the labor of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius is destined to extinction in the vast death of the solar system, and that the whole temple of Man’s achievement must inevitably be buried beneath the debris of a universe in ruins—all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy which rejects them can hope to stand.¹⁹

Yet Christians proffer just the philosophy which rejects this conclusion. Will it stand? If it stands it will do so not necessarily because of complementary theories in science. If it stands it will have to stand on faith.

VIII. EVANGELICAL EXPLICATION

We have been insisting here that what makes the Christian doctrine of creation Christian is that it consists in explicating truths inherent in the more compact experience of the gospel. In the distant and more recent past some theologians have sought to say something like this by affirming that our knowledge of creation derives solely from faith (cf. Hebrews 11:3). It was Clement of Alexandria who said “faith is the ear of the soul.” Bultmann modified the metaphor a bit when saying, “To every other eye than the eye of faith the action of God is hidden.”²⁰ What can the soul hear or the eye see? It can hear things that natural reason is deaf to and see things invisible to mundane research. It can hear the call of the Beyond. It can spot the shadow of the ultimate.

¹⁸A. R. Peacocke, *Creation and the World of Science* (Oxford: Clarendon, 1979) 329. Not everyone is so pessimistic. Princeton physicist Freeman J. Dyson posits an open universe eschatology according to which life evolves from its present fleshly embodiment into an interstellar black cloud, and as the universe cools it slows its metabolism and adopts patterns of hibernation, thereby making it possible to gain an infinitely long subjective lifetime: “Time Without End: Physics and Biology in an Open Universe,” *Review of Modern Physics* 51/3 (July, 1979) 447-60. Robert Russell, who directs the Center for Theology and the Natural Sciences at the Graduate Theological Union in Berkeley would contend that theology and science do not speak separate languages and, therefore, Dyson’s partial corroboration of the Christian vision is theologically significant.

¹⁹Bertrand Russell, *Why I am Not a Christian* (New York: Simon and Schuster, 1957) 107.

²⁰Clement, *Stromata*, V.1; Rudolf Bultmann, “Bultmann Replies to His Critics,” *Kerygma and Myth*, ed. Hans-Werner Bartsch (2 vols.; London: S.P.C.K., 1957-62) 1.197.

Luther, as one might expect, acknowledged that the philosophers could stumble upon general knowledge about the beginning of the world, but the exalted truth that everything was created by God requires our hearing the divine Word. But one with no less confidence in natural reason than Thomas Aquinas states flatly that faith is required to ascertain *creatio ex nihilo*. “We hold by faith alone,” writes Thomas, “and it cannot be proved by demonstration, that the world did not always exist.” So insistent is Thomas that he warns us not to erect our cosmologies on the shifting sands of science lest we “give occasion to unbelievers to laugh” at us for less than cogent reasoning.²¹ Karl Barth follows suit by saying that “the doctrine of the creation no less than the whole remaining content of Christian confession is an article of faith, i.e., the rendering of a knowledge which no man has procured for himself or ever will; which is neither native to him nor accessible by way of observation and logical thinking.”²²

Now the position I am advocating here modifies, yet affirms, this apparently exclusivistic claim that knowledge regarding the nature of creation comes *sola fide*. I would not want to set aside completely the powers of natural reason or knowledge gained through observation and logical thinking. Not only does empirically based research yield a grand accumulation of intracosmic facts; it even provokes our curiosity and stimulates our imaginations to ask about what lies beyond. Nevertheless, what Christians want to say about the cosmos is not simply the result of our powers of observation and natural reasoning. The Christian notion of creation is prompted by a provocation from the Beyond, from the extracosmic reality we call “God.” An event has taken place at which time the infinite entered the finite and made itself known through saving activity. Our intellectual response to this event consists in a process of thinking whereby we employ our natural capacity for reason to reflect upon the saving activity of the Beyond. We

ponder the significance of our intracosmic observations in light of our awareness of the extracosmic reality.

The awareness of the Beyond is a matter of faith. Thinking about the Beyond is an intellectual activity, the structure of which we share with all other thinking activities. The Christian doctrine of creation as we have it, then, is the product of both revelation and reason, of both faith and science. It is the result of evangelical explication.

²¹Thomas Aquinas, *Summa Theologica*, Part 1, Q.46; Art. 2.

²²Karl Barth, *Church Dogmatics* (4 vols., Edinburgh: T. & T. Clark, 1936-62) 3/1.3.