

# What the Bible *Actually* Says About The Origin of the Universe

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## A Brief History of Biblical Cosmology

One of the very interesting areas of biblical studies is creation. This didn't used to be a hot topic, but in modern history several things have happened to bring this issue to the forefront. Years ago, prior to the emergence of evolution and modern atheism, most people in western culture believed in God. Naturally, they assumed that God made the world. The biblical account was simply taken at face value and little attention was devoted to any in-depth analysis of the Bible's account of creation. (It's unfortunate that in the absence of controversy some Bible truths are neglected.) The pre-scientific Christian conception of the origin of the universe was very simplistic. Most people just believed that God had created the universe a few thousand years before their time. The emergence of the theory of biological evolution challenged the assumption that the world was recently created. After all, if evolution were true it would have taken long ages for life to evolve from simpler organisms, and longer for the first life forms to have emerged in the first place. With the growing popularity of evolution, investigators began to look for evidence of the antiquity of the earth. Thus was born the modern science of geology.

Most of this information was difficult for the layperson to digest. Though conservatives (those who tend to understand the Bible more literally) rejected evolution as incompatible with the Bible, most eventually accepted the proposition that the earth might not be as young as previously thought. In an effort to square this emerging realization that the earth may be old (much older than eight to ten thousand years), with the Bible, some put forth what today is known as the "gap theory." The gap theory proposed that God created the earth (Gen. 1:1), then at Satan's fall, judged the earth and that it lay in ruins for a very long time (Gen. 1:2), until God renovate it (Gen 1:3-2:3). According to this theory, the earth could be any age – since no one knows how long the proposed gap between verses 1 and 2 might have been. This seemed to square the Bible with then current thinking about the age of the earth, while at the same time clearly rejecting biological evolution. This view came to be one of the dominant views among theological conservatives, and remained so until fairly recent times (about the mid-1950s). If you look closely at the writings of some of the leading Bible expositors of the early twentieth century, you will find that many of them held to one form or another of this theory.

Other ideas designed to reconcile the Bible and scientific observations were also suggested. One theory proposed that God created the materials of the universe and then waited a very long time before forming them into their present arrangement. This view became known, somewhat contemptuously, as "the chaos theory." Theistic evolution was also proposed. This theory not only attempted to square the Bible with the presumed antiquity of the earth, but it went a step further and attempted to reconcile the Bible with biological evolution. Theistic evolution suggested that God used evolution as the means of creation, at least partially. Another view, called "progressive creationism," suggested that the days of Genesis chapter one were actually long ages in which God performed his work of creation. This view was essentially non-evolutionary in that it did not account for the rise of the various species through evolution; it simply sought to square the Bible with current thinking about geology and paleontology.

In more recent time the trend among some biblical conservatives has been to go back to the original conception of a young earth, indeed a young universe. Recent creationism began to gain ground in conservative circles in the 1960s and 70s. There were several reasons for this. The gap theory was in serious trouble. Some of its major proponents were beginning to notice serious

flaws in the theory (which we will discuss further along). Conservative Christians found their backs to the wall as they saw evolution, with all of its implications, sweep through Western intellectual circles like a firestorm. They desperately needed to mount a serious challenge, and finding support for a recent creation would be the surest antidote for evolution. Time is to evolution what fuel is to fire, take away the fuel and the fire dies; take away time and evolution dies. Other theories seemed to have fallen by the wayside, or clearly had major problems. Perhaps because of its adversarial relation to evolution, recent creationism quickly coalesced into a highly focused and organized movement. Organizations like the Institute for Creation Research have been prolific producers of educational materials, most of which has been distributed in churches, Christian colleges, and seminaries, where it has had a significant impact. Part of the appeal of recent creationism is that it claims to reconcile a literal and non-evolutionary interpretation of the Genesis account with the complexities of modern science. According to recent creationism, God created the universe in a mature state perhaps eight to ten thousand years ago. According to recent creationism, the universe appears to be old not because it is old, but because it was created “mature” – imparting to it the appearance of age.

Of course recent creationism has serious flaws of its own. Although the early geological evidence offered for the age of the earth was largely suspect due to its evolutionary bias, in recent years (since the mid-1900s) a growing body of evidence suggests that the universe is much older than the eight to ten thousand years allowed by recent creationism. And recent creationism hinges on the ability of mature creation to fully account for the appearance of the age of the universe, but this explanation is seriously flawed, as will be explained further along.

Just how important is biblical cosmology? It’s very important if you happen to be a university student, or if you happen to be a pastor or Sunday school teacher who is sometimes asked how the early chapters of Genesis fit with modern science. Before proceeding, we need to understand three key terms that will be used throughout this discussion. They are: “creation *ex nihilo*,” “immediate creation,” and “mediate creation.”

Creation *ex nihilo*: The terms “*ex*” and “*nihilo*” are Latin, and when put together mean, “out of nothing.” Creation *ex nihilo* refers to the original creation of time, matter, energy, space, gravity, etc. It does not refer to the subsequent forming or shaping of matter after its original creation.

Immediate creation: Immediate creation is simply another term for creation *ex nihilo*, and the two terms are completely interchangeable. Immediate creation signifies that God brought something into existence directly – as opposed to forming something that already existed.

Mediate creation: Mediate creation refers to forming, or fashioning something out of existing materials. The creation of Adam and Eve are examples of mediate creation, since God did not produce man out of nothing, but rather out of the dust of the earth, which he had previously created, and woman out of man.

## **Biblical Creation Views**

Now that we’ve had a brief historical overview of biblical cosmology, let’s take a more detailed look at each of the major creation views: the pre-scientific view, theistic evolution, progressive creation, the literary “framework” theory, the gap theory, classic recent creationism, relativistic recent creationism, and the “chaos,” or as I prefer to call it, the “preformative” theory.

### **The Pre-scientific View**

The pre-scientific view of creation, held prior to the modern scientific period, is that the world was created out of nothing about six thousand years ago. The nice thing about this view is that it didn’t require any elaborate explanations to account for why the universe and the earth appear to be old. To the pre-scientific mind the universe looked to be about six thousand years old, and as they say, “that was that” – neat and simple.

### *Factors Giving Rise to the Pre-Scientific View*

The pre-scientific view was based on a simplistic reading of the Old Testament that gave no consideration to the problem of the apparent age of the universe. By adding up the genealogies and reigns of the OT kings, some scholars thought they could arrive at a fairly accurate date for creation. Using this method, Bishop James Ussher (1581-1656) dated creation at 4004 B.C. [Bishop Ussher's chronology was so widely accepted that his dates appeared in the margins of many Bibles until very recently; and while it is no longer considered to be valid by Bible scholars (primarily because of problems with the pre-flood portion of the chronology), it was still an amazing piece of work for its time.]

### *Problems With the Pre-scientific View*

Of course, there were problems with the pre-scientific view. First, it didn't entirely fit with the biblical text. The creation account in Genesis does not make the claim that everything recorded from Genesis 1:1 to 1:31 occurred in a six-day period (literal, or otherwise). As we will see when we look at what Genesis actually says, it is virtually certain that the *ex nihilo* creation (*i.e.*, the original creation out of nothing) occurred sometime before the first of the six formative days of Genesis chapter one. Second, the pre-scientific view does not account for the apparent age of the universe. The universe clearly appears to be older, much older, than six thousand years (or even a million years, for that matter). We will discuss the apparent age of the universe further along. Thus, if the universe were only a few thousand years old, we would need to account for the discrepancy between its actual age and its apparent age (currently estimated at about 13.8 billion years).

## **Reconciliation Theories**

Only in the modern times have we become aware of the fact that the universe appears to be much older than a few thousand years. Prior to modern times there was no need to reconcile the Genesis account with scientific observations. However, with new evidence of the age of the universe, it became necessary to speculate as to how Genesis and science might be squared. This need gave rise to numerous theories we will call "reconciliation theories." A reconciliation theory is a speculative understanding of the Genesis account and how it might fit with modern science. Of course, not all scientific theories are valid. While many Christians accept the scientific evidence that the universe is old, most conservative students of the Bible reject biological evolution as both incompatible with the Bible and unsupported by valid scientific observations. Nevertheless, there have been those within Christendom that have embraced biological evolution, and that is reflected in at least one of the theories we will examine. Naturally, the degree to which each theory reconciles Genesis and modern science varies. Some of these theories provide for reconciliation between Genesis and science both in regard to the age of the universe and biological evolution. Other theories reject biological evolution, at least at the macro-evolutionary level, and simply attempt to reconcile Genesis with the apparent age of the universe. Progressive creationism even attempts to reconcile Genesis with modern paleontology. It is important for the student of the Bible to understand that all of these theories are speculative. It is essential to make a distinction between what the Bible actually says and reasonably implies, and speculations about how that information might relate to scientific observations. A particular reconciliation theory may prove to be unserviceable because it doesn't do justice to the biblical text, or because it doesn't do justice to well-established scientific observations, or because it's simply not logical. But just because a particular reconciliation theory proves untrue doesn't mean that the Bible is wrong. Remember, reconciliation theories are only speculations about how Genesis "might" fit with modern science. It is also worth pointing out that these theories seem to come and go in terms of popularity. From the early nineteen hundreds to the nineteen-sixties the "chaos" theory and the gap theory were predominate among biblical conservatives; whereas since the nineteen-seventies, recent creationism has become very popular. Just as there was a

paradigm shift among biblical conservatives in the nineteen-seventies, we are now on the verge of another shift as the flaws of recent creationism are becoming more apparent. For those who might have been taught a reconciliation theory as fact, such a paradigm shift can be disconcerting, to say the least. It is important to keep in mind that Christian teaching on the subject of creation contains two distinct streams of information. One stream is what the Bible actually says about creation (primarily the Genesis text). The other stream is what we think that biblical information means in light of our understanding of, and attitude toward modern science. Most often both streams are combined and presented as an interpretation of Genesis; that's unfortunate because such a procedure does not distinguish the biblical facts from the theoretical component. Most of the theories given below have serious problems, yet it is not difficult to find individuals who subscribe to each of these theories. In fact, there are, no doubt, some whose view of Genesis has not progressed beyond the pre-scientific view. While such laxity is not fatal to our faith, it may be fatal to our witness. If we refuse to acknowledge what others see clearly, we can hardly expect our message to be taken seriously.

### **Day-Age Theories**

The day-age theories propose that the days of Genesis chapter one were not literal twenty-four hour days, but long geologic ages—millions, or billions of years in length. There are two basic forms of the day-age theory: “theistic evolution” and “progressive creation.” While these are both day-age theories, they are very different in that theistic evolution accepts the concept of macroevolution (evolution from one species to another), whereas progressive creation attributes the origin of species to creative epochs spaced out over long geologic ages, rather than macroevolution. Interesting, much of the current paleontological evidence and much of the modern radiometric dating is consistent with progressive creationism (except, for example, dates for humans extending beyond the range of biblical history.)

#### **a. Theistic Evolution**

Theistic evolutionists speculate that God created the materials of the universe and the physical laws, and then used evolution (chance interaction, mutation, and natural selection) to complete the process. They offer the same evidence for theistic evolution that is offered by non-theistic evolutionists. There are varieties of theistic evolution. Some proponents suggest that God created the first life and allowed evolution to run its course; others hold that life arose as a result of natural processes from the materials that God created.

##### *Problems With Theistic Evolution*

From the biblical point of view, there are two major problems with theistic evolution. First, it is clearly not compatible with the account of creation given in Genesis 1-2. Genesis states that man is a direct creation of God. Genesis also states that God created all of the animals “after their kind” (Gen. 1:24,25). This statement would certainly seem to preclude the idea that all life has arisen from simpler forms. Secondly, the account of man’s fall into sin and the plan of redemption, of which the rest of the Bible is largely occupied, are based upon a normal/objective understanding of the first few chapters of Genesis. If the creation account is to be regarded as mythical, then the entire message of the Bible would be questionable. Third, there are fundamental scientific problems with the theory of evolution itself (as examples: the problem of irreducibly complex systems, the apparent design of organisms, the problem of biogenesis, and the problem of how non-intelligence produced the information necessary for the pattern of living things).

#### **b. Progressive Creationism**

Progressive creationism suggests that God’s creative activity extended over long ages. This view, which rejects macroevolution as the origin of species, regards each of the days of the

Genesis account as representing an era of indeterminate (and possibly variable) length, during which God progressively created new things. According to this theory the species arose in the time frame that modern science claims is indicated in the fossil record, but not as a result of evolution. Accordingly, the days of Genesis are understood as a literary structure representing these epochs. In the past, some proponents of day-age theories used 2 Peter 3:8 as support. (In 2 Peter 3:8, Peter indicated that with the Lord a thousand years is “as one day.”) However, as we will see, 2 Peter 3:8 does not support this use.

### *Problems With Progressive Creationism*

There are several difficulties associated with progressive creationism. First, it doesn't seem compatible with the most literal interpretation of Genesis. However, the theory cannot be ruled out on that basis, because it is possible that the days of Genesis chapter one were intended simply to represent indefinite time periods, not 24 hour days. There are numerous instances in the Bible where the term “day” represents a time period other than a 24-hour day. (Take for example the frequently used expression, “the day of the LORD.”) In this case, the reference to “evening” and “morning” would simply form a kind of literary inclusio for each metaphorical “day.” Second, as to the use of 2 Peter 3:8 where Peter says, “. . .one day is with the Lord as a thousands years, and a thousand years as one day,” this does not mean that when scripture indicates “a day” we are at liberty to interpret that to mean an indefinite amount of time. Peter was simply saying that God is patient and unaffected by time. He was not saying that when scripture indicates a time relationship we are at liberty to take it figuratively. It is odd that 2 Peter 3:8 would be chosen to support the notion that time references in the Bible are somewhat elastic. Actually, this passage indicates quite the opposite. If “a day” in this passage wasn't literally “a day,” and “a thousand years” wasn't literally a thousand years, this passage would be nonsensical, since that meaning only comes into sharp focus when we understand that Peter is saying a literal twenty-four hour day, and a thousand years are all the same to an eternal (timeless) God. If the terms “one day” and “a thousand years” were interchangeable Peter would be saying that a thousand years is as a thousand years to God, which would make no sense. However, having said that, the fact that 2 Peter 3:8 does not support the day-age concept is not a negative for this view. It is more the lack of positive biblical evidence. Third, progressive creationism would need to be able to explain how the creation of plants preceded the forming of the sun. While this may not be an insurmountable problem, it does require a reasonable solution. (Perhaps the two events actually happened in tandem, with one being relegated to one era and the other to the next era.) Fourth, it is sometimes suggested that Exodus 20:11 seems to preclude this view by stating that everything was created in six days. Of course, if Exodus 20:11 simply reflects the Genesis account, then whatever “day” means in Genesis is also meant in Exodus 20:11. However, moving from a more literal view to progressive creationism in order to reconcile the biblical record to modern science still does not solve all the problems. Even if one accepts progressive creationism, there are still incompatibilities between the record of biblical history and modern science, particularly in the area of scientific dating (for example, the dates of human existence). Unfortunately, the scientific dating process is itself theory-bound (for example, uniformitarianism, and the problem of the determining the origin of radioactive elements on earth.) Until far more information is available on the validity of the proposed scientific dates, it would be premature to accommodate biblical interpretation to these dates.

Several interesting books have been written in the last few years promoting one version or another of the day-age theory. (See, The Finger Print of God and The Creator and the Cosmos, both by Hugh Ross, and A New Look at an Old Earth, by Don Stoner, and The Science of God, by Gerald L. Schroeder).

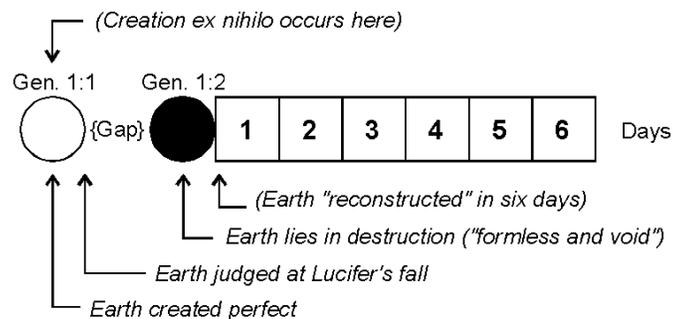
## The Literary Framework Theory

The literary framework theory states that the days in Genesis chapter one serve merely as a literary structure in which the creation story is either told, or set. According to this view the six days of Genesis were not six days in which creation took place, but six movements (or chapters) in the creation story. A variation on the literary framework theory is that God revealed the account of creation in six days, and that Genesis contains a synopsis of what was revealed each day. In either case, the six days are not viewed as a time frame for the work of creation, but simply a literary structure for telling the story of creation. This theory does not speak directly to the issues of the age of the universe or evolution, but it could be compatible with either. The literary framework theory can stand-alone as an extremely vague general theory, or as a complement to another more detailed theory, such as progressive creationism or theistic evolution.

## The "Gap" Theory (also referred to as, the "reconstruction theory")

The gap theory proposed that God created the world, but it was subsequently judged with devastating effect when Lucifer fell. This theory proposes that the six-day account in Genesis chapter one is the account of the earth's reconstruction, after its judgment. According to this theory, the original creation is mentioned only in Genesis 1:1. Genesis 1:2 describes the condition of the earth after its judgment, and Genesis 1:3-31 describes the earth's subsequent recreation. As is the case with most theories, there are variations from one proponent to another. Some gap theorists have even suggested that there might have been a pre-Adamic race of men who lived prior to Genesis 1:2 ; however, it is not necessary for us to examine all of the variations since the general theory can be shown to be incompatible with the text of Genesis.

### The Gap Theory



Several arguments have been offered in support of the gap theory. First, it is assumed that it would have been out of character for God to have created the earth "formless" and "void" (Gen. 1:2); therefore, something must have happened to cause the earth to become formless and void. Second, the terms "tohu" ("formless") and "bohu" ("void," or "empty") are used together in only one other instance in the Bible (Jer. 4:23) where they clearly indicate judgment. Third, the idea that the original creation was judged by God could fit with the biblical description of the fall of Lucifer, presumably recorded in Ezekiel 28:11-19 and Isaiah 14:12-21. Fourth, the gap theory appears to reconcile the Genesis account with the apparent age of the universe. (A variation that subscribes to a pre-Genesis 1:3 plant and animal kingdom also attempts to square Genesis with modern fossil dating.)

### *Problems With The Gap Theory*

There are three principal problems with the gap theory. First, the grammar of Genesis 1:1-2 does not allow for a gap between verses 1 and 2. Quite interestingly, this fact was first brought to light in the 1950's by one of the foremost gap theorists of the time, Dr. Merrill F. Unger, in an article which appeared in the theological journal *Bibliotheca Sacra*, in January 1958, titled: "Rethinking the Genesis Account of Creation." The reason, as Dr. Unger pointed out, is that "In the original language [Hebrew] Genesis 1:2 consists of three circumstantial clauses, all describing conditions or circumstances existing at the time of the principle action indicated in verse 1, or giving a reason for that action." To put it simply, what Dr. Unger pointed out was that the timing of the main verb of the sentence (v. 1, "created") controls all the circumstantial clauses describing the conditions in verse 2. (Verses 1 and 2 are one sentence in the Hebrew.) What this means is that at the time God created the heavens and the earth, <clause #1:> "the earth was [at the time of its creation] without form, and void;" <clause #2:> "and [at the time of creation] darkness was upon the face of the deep;" <clause #3:> "and [at the time of creation] the Spirit of God moved upon (or better, "was moving upon,"-Heb. participle) the face of the waters." When read correctly there is simply no way that verse two can be a description of the earth having been judged subsequent to it's creation in verse one, because verse two describes the conditions of the earth *at the time* of its creation in verse one. Such an understanding completely rules out any notion of a gap between verses one and two. Interestingly, Dr. Unger remained committed to the gap theory – albeit a modified version. His solution to the problem was to assert that the creation referenced in verse one was not, after all, the original creation, but the recreation of the earth after its original creation and judgment (which must have occurred prior to Genesis 1:1), thus placing the original creation, the earth's judgment, and the "gap" prior to Genesis 1:1. While this was a highly creative solution, it had the unfortunate side-affect of making the gap theory an "extra-biblical" theory, since it pushed the gap right out of the Bible! It took about twenty years for Dr. Unger's observations to take hold, but the shot had been fired, and ultimately the gap theory died – a victim of friendly fire.

Second, the gap theory was never well-supported biblically. The creation passage (Genesis 1:1-31) says nothing about the fall of Lucifer, or the earth being judged. All of that material has to be transplanted into the story.

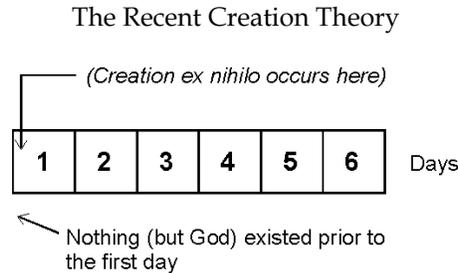
Third, a great deal of weight is placed on identifying the terms *tohu* (formless) and *bohu* (empty) with judgment. While it is true that the only other place these terms are used together in scripture is a picture of divine judgment (Jer. 4:23), it is also true that one example does not establish a pattern. There simply isn't enough biblical evidence available to conclude that these terms must refer to judgment when used together.

### **Recent Creationism**

Recent creationism proposes that the universe (*i.e.*, every created thing) was created recently, within the last ten thousand years (plus or minus a couple thousand years). There are two forms of recent creationism: classic recent creationism, which incorporates a concept called "appearance of age" to account for the apparent age of the universe, and relativistic recent creationism, which depends upon relativity to account for the apparent age of the universe. In some respects recent creationism is similar to the original pre-scientific view, in that it subscribes to a young creation, with the *ex nihilo* (original) creation occurring on the first of the six days of Genesis chapter one. In other ways it is very different from the pre-scientific view. It recognizes the discrepancy between the apparent age of the universe and the age limit allowed by the recent creation theory, and it seeks to reconcile the difference. Many recent creationists make extensive use, and sometimes misuse of scientific information in seeking to establish that the universe is young.

### a. Classic Recent Creationism

According to classic recent creationism, God made the world in a mature (fully developed) form approximately eight to ten thousand years ago. Because the world was created in a mature state, it naturally appears older than it is.



Recent creationists claim that either Genesis 1:1-2 is included as part of the first day of creation, or that these verses are nothing more than a summary title to the creation account. In other words, they dismiss the idea that Genesis 1:1-2 could be referring to an original *ex nihilo* creation that occurred prior to the first day. They also see support in Exodus 20:11, which seems to suggest that nothing was created prior to the first day of Genesis. This passage says, "For in six days the LORD made the heavens and the earth, the sea, and all that is in them...." Therefore, since the first day of Genesis would have been fairly recent (eight to ten thousand years ago—based on a reasonable Old Testament chronology), neither the universe, nor anything in it could be older than about ten thousand years.

The following are some examples of the kind of scientific information used to support this view. 1) Decay of the earth's magnetic field indicates it is less than ten thousand years old. 2) The amount of He<sup>4</sup> (helium) in the atmosphere (given that it is generated at a constant rate) indicates that the earth could be not more than about ten thousand years old. 3) The presence of oil under pressure creating "oil gushers" indicates a recent creation, since otherwise the pressure would have been relaxed over long ages through dissipation of pressure in permeable rock. 4) The amount of dust found on the moon suggests that the moon is seven to eight thousand years old (based on assumed levels of annual deposit). Also, the amount of cosmic dust deposited on the earth indicates an age less than ten thousand years. 5) The earth's rotational velocity indicates that the earth could not be old. Given a constant rate of decline in velocity, if the earth were billions of years old, the original high rotational velocity would have produced a very different looking planet (we would expect the land masses to have formed primarily around the equator). 6) The existence of comets indicates a young universe. Since comets give off particles as they travel through space, if the universe were billions of years old, the comets would already be completely spent.

The difficulty with using the above, and similar observations as evidence of recent creation is this: Even if we were to assume that the above observations are valid, they still would not prove—nor would they necessarily even support a recent *ex nihilo* creation. The reason is that all of these observations can be fully accounted for by a recent "mediate" creation (*i.e.*, a rearrangement of existing, previously created materials). In other words, all of these factors can be accounted for if the six formative days of Genesis were fairly recent (within ten thousand years), even though the original creation *ex nihilo* might have happened eons before. (Remember, mediate creation could involve rearrangement of matter even at the subatomic level—isn't that what Jesus did when he turned water into wine? He didn't make the water disappear and the wine appear *ex nihilo*, he turned the water, which already existed, into wine. If we can make magnets without performing *ex nihilo* creation, why should we think that God could not establish the earth's magnetic field or rotational velocity without performing *ex nihilo* creation?)

This illustrates a key methodological flaw in recent creationism. Since recent creationists assume that all creation, including the creation *ex nihilo*, occurred within the six days of Genesis, they therefore conclude that evidence of recent mediate creation activity, such as illustrated by the above observations, provides evidence of a recent creation *ex nihilo*, and thus a young universe. However, this reasoning is both biblically and logically unsound. It is biblically unsound because, as we will see in the following discussion, the Genesis account clearly places the *ex nihilo* creation prior to the first day of Genesis, meaning that the *ex nihilo* and *mediate* aspects of creation may have been widely separated in time. It is logically unsound because it fails to consider an alternative explanation, such as a remote original creation (perhaps billions of years ago) combined with a recent mediate creation (in which the original materials of creation were formed into their present fashion).

#### *Problems With Recent Creationism*

There are three basic problems with classic recent creationism – an observational problem, a logical problem, and an ethical problem.

Albert Einstein in his special theory of relativity ( $E = MC^2$ ) demonstrated the mathematical relationships between energy, matter, and the velocity of light. The unique qualities of light are very helpful in understanding the size and age of the universe. The current scientific estimate of the size of the observed universe, *i.e.*, the universe that has been observed, puts it at a radius of about 13.8 billion light-years. [The “observed” universe should not be confused with the “observable” universe, which is much larger – currently estimated at about 46 billion light-years in radius. Since the light from the furthest galaxies left, those galaxies have moved even further away, thus the observed universe and the potentially observable universe are not the same size.] If, as astronomers estimate, we are seeing light from galaxies approximately 13.8 billion light-years distant, this would lead us to the conclusion that the universe must have been in existence for at least 13.8 billion years (approximately), because that’s the minimum amount of time it would take for the light from those distant galaxies to reach earth. This naturally leads to an estimate of 13.8 billion years for the age of the universe. We have to be very cautious with these numbers, however, since no one has taken a tape measure out there and gotten an exact figure! Nevertheless, it is important to recognize that it doesn’t do much good arguing over the validity of these numbers because most knowledgeable creationists generally accept the current estimate of the size of the universe anyway, and even if these figures were off by 99% (which no cosmologist, Christian or non-Christian believes), the universe would still be 150 million light-years in radius and have an estimated minimum age of 150 million years – far older than the ten thousand years estimated by recent creationists. D. Russell Humphreys, (a leading recent creationist who holds a Ph.D. in physics) says, “*Some laymen pondering this question wonder if the astronomer’s estimates of the distances might be greatly in error. I don’t think so. Astronomers have dozens of methods for establishing such distances, all of which generally agree with one another. Many of the methods, especially for closer objects such as the Andromeda galaxy, are based on very reasonable assumptions, such as the overall size or brightness of a galaxy. For that reason, I am convinced that the large distances are generally correct, at least within a factor of two or so.*” (From: Starlight and Time, by D. Russell Humphreys, p. 10.)]

Some have suggested that perhaps the solution to the problem is that the speed of light was faster in the past than it is now, so it really didn’t take that much time for the light to get here. However, such a solution probably isn’t practical given Einstein’s Special Theory of Relativity. Occasionally, someone will suggest, “*But couldn’t God make light go faster?*” And of course, the answer is “Yes” – and he could also make elephants fly, but what God “could” do and what the Bible and observation of the universe indicate he “has” done are entirely different things, and we won’t make much progress if we confuse the two. And, as we will see further along, there are some features in the universe that cannot be accounted for by simply adjusting the speed of light (for example galaxies completely merged, or one galaxy having past through

another galaxy as in the case of the Cartwheel Galaxy). The simple fact is that the universe appears to be much older than ten thousand years.

Secondly, recent creationism depends upon an equivalent relationship between “appearance of age” and “maturity.” In other words, it requires that appearance of age equal maturity. The reason is that recent creationism depends upon the mature creation argument to explain why some things in the universe look old. When recent creationists look at the universe and see features that appear to be millions (or billions) of years old, they account for the apparent age by virtue of the fact that the universe was created mature. So, recent creationists, in effect, take the position that one cannot distinguish between an object appearing to have age, and a newly created, mature object. The problem is that this line of reasoning is easily shown to be false. Consider the following. Let’s imagine an experiment that demonstrates “mature creation” and “appearance of age” are not the same, and that mature creation cannot account for the universe’s appearance of age. (Remember, if the appearance of having age can be fully accounted for by maturity, logically it should be impossible to distinguish between the two, even in an imaginary experiment.) For our virtual experiment we’ll need a few things. First we need a time machine. We will also need a few volunteers. The first volunteer will be our time machine operator. The second volunteer will need to be a very healthy young man, about twenty years old. This volunteer will be more difficult to find because he needs to be a near perfect specimen of humanity. We will also need a medical doctor and some medical equipment. Now, we’re ready to begin. The first thing we have to do before the doctor arrives is to transport our healthy young man back to the Garden of Eden just moments after Adam’s creation, and have him stand beside Adam. The next thing we need to do is have the time machine operator return to the present to collect the doctor and his medical instruments and take them back to the Garden. Once back at the Garden, the doctor is met by two very healthy looking, mature young men. Remember, the doctor has never seen either of these two men. Now, here is our experimental question: Given the scenario as we have described it, would it be possible for the doctor to distinguish between Adam, who was newly created in a mature state, and the young man who reached maturity through twenty years of growth and development? Well, let’s listen in as the doctor makes some observations. (We chose an old country doctor just for fun.) Doctor: *“Ok, let’s look at you first sonny-boy. Now, what’s that I see there in your mouth? Is that a filling in your tooth?”* (At this point, our very suspicious doctor is pulling a highly miniaturized C.T. scanner out of his bag and moving it over the man’s body.) *“Well, I’ll be! You have a very nicely healed skull fracture. Did you fall out of your crib when you were a baby?”* Now, I’ll let you guess what other features of growth and injury our doctor will find in his first subject, but he won’t find any of these things in Adam—no fillings, no scars, no calcium deposits around healed fractures, no arthritis, no degeneration of cartilage in joints, worn down teeth, etc. Can you guess why? It’s simple! “Maturity” and “age” (or, the appearance of age) aren’t the same at all. Now when we look at the universe, if what we saw was simply a mature universe, recent creationists would have a valid point, but that’s not at all what we see. We see a universe covered in scars—the scars of great age; galaxies that have collided, stars having spent their fuel and having exploded across thousands of light-years of space, gravitational interference between galaxies that has distorted the shape of those galaxies across many tens of thousands of light-years of space, light streams in space containing billions of years of history in light images streaming all the way back to their sources. So, if what we see when we look at the universe cannot be explained by a mature creation—and it can’t—the recent creationist is left without any explanation of why the universe looks so old, and thus the theory breaks down.

Third is the ethical problem. Anyone who knows anything of God’s character from the Bible would have to agree that God is holy and cannot lie. Yet in an indirect, and I’m sure, unintended way, recent creationism takes the position that God has lied in creation. Let me explain. Astronomers estimate that we are seeing light from distant galaxies approximately 13.8 billion light-years away. Now, if we are seeing light from sources that far away, the natural

(reasonable) assumption is that the universe could not be any younger than the distance divided by the maximum speed of light (distance/186,000miles/sec.), because that's how long it would have taken the light to travel to earth from its point of origin. At this point recent creationists suggest a possible solution. They say, "Since God created the universe mature, he must have created the light stream in space so light now reaching us was actually created "in the pipe" (*i.e.*, "in situ") such that the light we are presently seeing through our telescopes was created less than ten-thousand light-years from earth and is just now reaching us. In other words, light that we are seeing from distant galaxies never originated from those sources. The images we see were "planted" in space at just the right distance from earth to be reaching us at the present time. In fact, according to this explanation, any light image we might see through a telescope of an object greater than about ten thousand light-years distance never actually originated at the source it appears to have come from. (If this were true, the epistemological implications would be staggering.) Such an explanation plants seeds of doubt as to the true nature of the universe and what can be known by observation, and that's highly problematic since God clearly intended that our observation of the heavens should lead us closer to the truth of his greatness and power (Psa. 8:3; 50:6; 97:6).

Now, we haven't yet come to the real ethical problem posed by the recent creationist's "created in transit" explanation. If the foregoing explanation were true, then for a galaxy 13.8 billion light-years distant from earth, the light stream at the moment of creation would have been approximately 13.8 billion (minus 10,000) light-years. Now, at the moment of creation we have a light stream slightly less than 13.8 billion light-years long. So, what's in that light stream? History, that's right—history, image after image of events in succession are what the light stream contains. Imagine for a moment that we had a spaceship that could fly all the way from earth through the light stream of a distant galaxy—all the way back to the source, and say we mounted a video camera to the nose of our spaceship. As we flew back through the light stream (all 13.8 billion light-years), one of two things would happen; we would either hit a discontinuity (a break in temporal {historical} continuity) due to the fact that there has only been ten thousand years of history), or we would record 13.8 billion years of the history of the source galaxy; but that would be 13,799,990,000 billion years longer than the universe has existed if it was created about ten thousand years ago! Taking this one step further, this would imply one of two things: Either the universe is discontinuous (more like a stage prop), or that God has recorded a history of the universe that never happened. Either of these explanations implies that God has intentionally misled us about the true nature of the universe.

If that isn't enough of a problem, it gets worse. We have images of large nebulae, galaxies in collision (some even completely assimilated), and large intergalactic gravitational effects for which only an old universe (*i.e.*, older than ten thousand years) can account. Take the merger of two galaxies as an example. Two galaxies, each with a breadth of about a hundred thousand light-years could hardly merge in the space of ten thousand years. Even if God created them such that their outer edges were already in contact (odd), and even if they were moving toward one another at the speed of light (not really feasible), the minimum time required for a complete merger would be fifty thousand years (you can do the math yourself—one moves fifty thousand light-years to the left, the other moves fifty thousand light-years to the right). Add to that the amount of time required for the image to arrive on earth (*i.e.*, the distance in light-years), and you can see that ten thousand years doesn't even begin to be enough time, even in this greatly oversimplified example. So, recent creationists are forced to suggest that the universe was created (at time zero) with all of these "scars"—scars depicting a history that never was. And to make it all look very realistic, those events that never happened appear to have obeyed the general laws of motion and gravitation! (Astronomers have observed that when two galaxies have merged, or are in the process, their angular momentums and gravity merge also, according to the general laws of motion and gravity, causing the new galaxy to form a shape predictable by the classical laws of physics.) In some cases, nearby galaxies have simply "brushed," scattering stars in their

spirals across tens of thousands of light-years. In the case of the Cartwheel Galaxy one galaxy has passed completely through another, blowing out a huge ring of gas over a hundred thousand light-years from its center that is now condensing into new stars. It is physically impossible that such structures could have been formed in the time allowed under recent creationism. If God put his omniscience to work to devise a plan to thoroughly deceive man about the origin of the universe, he couldn't have devised a better plan than what the recent creationist proposes. Even some prominent recent creationists are beginning to acknowledge this problem. Dr. D. Russell Humphreys, (cited above) states in regard to the appearance of age theory, "...it has disturbing theological and philosophical implications." (See, *Starlight and Time*, by D. Russell Humphreys, p. 51.)

### **b. Relativistic Recent Creationism**

In view of the problems associated with classic recent creationism, at least one recent creationist has proposed a solution that attempts to reconcile a recent creation with the mounting body of evidence that the universe has passed through billions of years of history. Dr. D. Russell Humphreys proposed a relativistic solution in which the universe could have aged billions of years while only six days passed on earth. The theory itself is complex and based on the fact that gravity distorts time. Dr. Humphreys' theory, which could be termed "white hole cosmology," postulates that the universe expanded out of a white hole (a hole with a gravitational event horizon, but from which matter and light can escape, but not re-enter – essentially a black hole in reverse). According to this theory the earth is at the center of the universe, and since an event horizon affects time, making it run incredibly fast, as the universe expanded and the event horizon shrank, the entire universe (with the exception of the earth) eventually passed through the event horizon. Since the event horizon would weaken as it shrank, the greatest aging effects would be seen in the galaxies furthest from earth (since they passed through the event horizon first, while it was still strong). On the surface, white hole cosmology seems to provide an explanation of the age differential between the earth and more distant parts of the universe; however, the specifics, as proposed by Humphreys face enormous problems both with the text of Genesis 1:1-31 and science.

#### *Problems With "White Hole Cosmology"*

As is the case with all modern theoretical views, the white hole theory is just that – a theory. Dr. Humphreys has attempted to demonstrate how portions of the universe could have aged billions of years while allowing only a few thousand years (earth time) for these events to transpire. As incredible as it might seem, such a theory, in general, might not be implausible. Relativity, quantum mechanics, and whatever set of relationships, as yet undiscovered, bind them together are part of the universe God created. Therefore, we should not be surprised to find that the solution to the creation mystery involves such concepts. This possibility notwithstanding, there are several major problems with the white hole cosmology as it has been developed to this point. First, there is no evidence that white holes have ever existed – or could exist. Second, the theory is characterized by strained biblical interpretation. Dr. Humphreys' alignment of this theory with the biblical days of creation is clearly problematic since many of the activities referred to during the six days of creation would have to occur from within the white hole (under incredible gravitational forces). He is forced to identify the water of Genesis 1:2 as the basic stuff out of which the entire universe was made. Likewise, he identifies the light in Genesis 1:3 as the result of thermonuclear fusion resulting from the gravitational implosion of a huge sphere of water approximately one light-year in breadth. Humphreys speculates that this huge sphere of water supplied the material out of which the universe was formed. Since he identifies the light of Genesis 1:3 as originating at the core of this massive ball of imploded water, he is forced to speculate as to the nature of the "day" and "night" referred to in verse 4. He suggests that the Holy Spirit himself became the light source for the rotating sphere of water. While this is

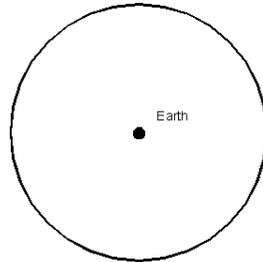
interesting speculation, it can hardly be called biblical interpretation, and it is far too speculative to be regarded as science, yet.

The fundamental problem with “white hole cosmology” is its rigid adherence to recent creation chronology, which insists on placing the creation *ex nihilo* within, rather than prior to the six formative days of Genesis, thus limiting the age of the universe to about ten thousand years or less (earth time). In proposing such a cosmology, it is possible that Dr. Humphreys has, unintentionally, sown the seeds for the destruction of recent creationism. According to this theory, 99% of the universe is much older (point of presence time) than even the maximum figure generally allowed by recent creationism. In other words, this view acknowledges that the bulk of the universe was not created recently. And, if it is acknowledged that the universe does, in fact, appear to be old (not just “mature”), why postulate such an unlikely theory just so one can contend that the earth is young—a claim the Bible itself never makes.

(See the illustration on White Hole Cosmology on the next page.)

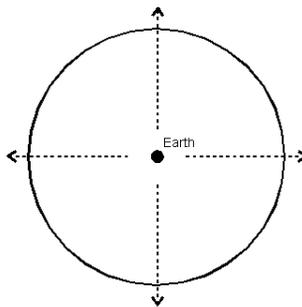
# White Hole Cosmology

Step #1



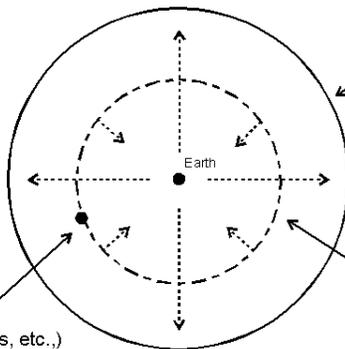
Bounded (finite) universe at creation —with earth at center (boundary and event horizon at same location)

Step #2



God causes the universe to expand

Step #3



Boundary of universe

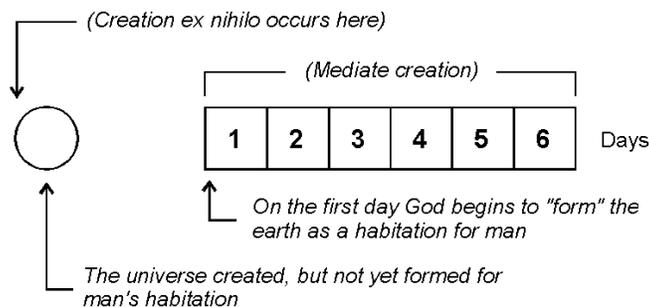
White hole event horizon shrinks as the universe expands past the horizon

Objects (galaxies, etc.,) passing through the event horizon age at highly accelerated rates compared to earth time. Eventually the event horizon disipates as the event shrinks in mass and loses gravity. Distant areas of the universe age billions of years while only six days pass on earth.

## The Preformative View (the “chaos” view)

This view is generally called the “chaos view;” however, the term “preformative” is preferable because it is more descriptive. This view proposes that God created the universe (*ex nihilo*) sometime prior to the first formative day of Genesis (possibly, but not necessarily in the distant past). The six days of Genesis describes God’s subsequent activity in preparing the earth as a habitation for man. According to this view, all of the work done by God during the six days of Genesis was formative, mediate creation, not *ex nihilo*, creation.

### The Preformative Theory



The basic preformative theory is based upon a literal understanding of the Genesis account (which will be explored in greater detail further along), and it doesn’t impose any age assumptions on creation (whether young or old), nor does it require any corollary theories, as is the case with recent creationism. It simply says that God created the materials *ex nihilo* in verses 1-2, and then, subsequently formed them. The preformative theory should not be confused with the gap theory. Whereas the gap theory depends upon a gap between Genesis 1:1 and 1:2 (where no gap is allowed by the grammar), the preformative theory allows for an unspecified time between Genesis 1:2 and 1:3, where the grammar presents no problem. Unlike the gap theory, the preformative view does not suggest any particular events as having happened during this time, nor does it suggest that the length of time between Genesis 1:2 and 1:3 was long or short; it merely observes that the original creation *ex nihilo* occurred sometime prior to the first day of Genesis chapter one.

### Problems With the Preformative Theory

The preformative theory does not attempt to date creation. It simply states that the original creation *ex nihilo* occurred prior to the first day of Genesis. This fits with what Genesis actually says, as we will see further along, and it has the added benefit of being compatible with current scientific observation – though fitting with the Bible is far more important. Historically, the main objection to this view has been to pose the question: “Why would God create the universe and then allow a period of time to pass before filling it with living things?” (It has been suggested that Isaiah 45:18 implies that the six-day forming and filling activity of God had to be closely associated in time with the *ex nihilo* creation.) The answer to the question is this: “We don’t know.” “Why” questions involving God are very difficult to address unless we are specifically told the answer in scripture. However, it is possible to venture a response: Maybe the “cake” wasn’t sufficiently cooled to be “iced.” At this point someone might say, “But why would God need to wait for the completion of physical processes before forming and filling his creation? Couldn’t he simply command everything to be instantly ready?” The answer is, “Yes – he could,”

but that does not mean he did, and there is absolutely no reason why he should have done so. Remember, he is the one who ordained the physical processes at the *ex nihilo* creation, and God, being eternal (timeless), would not be inconvenienced in the least by the passage of any length of time. Finally, there is nothing in Isaiah 45:18 that implies the forming and filling of the six days of Genesis had to occur “immediately” after the *ex nihilo* creation, only that the forming and filling had to occur at some point because that was God’s ultimate purpose in creation.

Occasionally one sees an objection something like this: If this view is correct, it would mean that God created the world in a chaotic (disordered) state, which would seem to be inconsistent with His character. The flaw in this argument is fairly obvious. Even though the original creation was as yet unformed (or we might say, in a “preformed” state), it was far from chaotic, for all of the ingredients of creation (including time, matter, energy, space, etc.), as well as the physical laws, were present. One can hardly call that “chaotic.” “Incomplete,” “unfinished” –Yes, but chaotic – No. Suppose I went into your kitchen while you were making a cake, and I looked and saw only a bowl of batter on the counter and said to you, “You can’t make a cake that way, why that’s beneath your dignity and character; don’t you know that cakes are orderly, with layers of cake and icing all nicely arranged and decorated?” You would probably suggest that if I would leave you alone for a few more minutes you would produce just such a cake. The same is true in regard to creation. The fact that all of the creative work was not done instantly does not imply that the job was somehow “chaotic” and beneath the dignity of God. If scripture indicates that God created in this way, what logical, or theological reason would have prevented God from first creating the universe, then forming and filling it as, and when, he saw fit?

### What the Bible Actually Says About Creation

The real test of any view is how well it reflects what the Bible actually says. The Genesis record (1:1-2:3) gives the most extensive account of creation contained within the pages of scripture. It tells of the creation of the raw materials of which everything is made, and how those materials were fashioned to make heavenly bodies, plants, animals, and finally man. Since we are approaching this topic from a Christian perspective, we must acknowledge that the Genesis account is factually true in every respect when understood as it was intended to be understood; and although it is not intended as a scientific statement, it is factually correct. The most prominent feature of the account is the arrangement of creation according to six formative days. (I say “formative” because there does not seem to be any indication of *ex nihilo* creation within the six-day period – we’ll discuss this observation in a moment.)

Another feature that should be apparent even to the casual reader is that the first two verses of the passage are not part of the first day. This is clear from the fact that each formative day begins with the phrase, “*And God said. . .*” and ends with, “*And there was evening, and there was morning – the {n<sup>th</sup>} day.*” Such a formularized opening and closing is a familiar literary structure, called an “inclusio;” and it shows where a segment begins and ends. When these structures are repeated as they are in this passage, they form a symmetry – that is, a pattern that makes them easily recognizable, and easy to remember. That’s good, because these highly visible structures can help us to see the natural breaks in the passage. What this structure indicates in Genesis one is that the account of the first day does not begin until verse three, so the first two verses should not be lumped together with the first formative day. This leads to a question of crucial importance: If verses 1-2, which comprise one sentence, are not part of the first day, and they clearly are not, in what way do they relate to the six-day account? There are essentially two possibilities: either these verses describe events that precede the first day, or they do not. Let’s take a look at each of these possibilities.

There is general agreement among interpreters that Genesis 1:1 refers to the original creation *ex nihilo*. If these two verses refer to activity prior to the first day, then the original

*ex nihilo* creation (which is not referred to in the remainder of the story) must have occurred prior to the first formative day. The implications of this are of enormous importance, because this would mean that the original creation of the universe could have predated the six days of Genesis chapter one by an indefinite period of time. If on the other hand these verses do not refer to events prior to the first day, they would likely have to be some sort of summary (descriptive) title to the creation account in vv. 3-31. Such is, in fact, the view held by some recent creationists, since they believe that nothing was created prior to the first day. Remember however, that lumping verses 1-2 with the first day (the usual practice of other recent creationists) is not a valid option, since it ignores the clear intent of the author as expressed in the structure of the passage.

The big question we must answer is this: Can we determine with any degree of confidence which of these two alternatives is correct? The answer is a definite, "Yes." If these verses are a summary descriptive title to the six days (vv. 3-31), then they ought to summarize the activities recorded for those six days. On the other hand, if they refer to events that took place prior to the first day, it should be possible to detect a progression in state from what is described in verses 1-2 to what is described in the following verses. (A change in state indicates a sequential and chronological progression, and thus would establish that the first two verses describe activity *prior* to the first day.)

What do we find when we look at Genesis 1:1-2? The passage says, "In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the spirit of God was hovering over the waters." In order to determine if this is a summary title, we need to ask: Does "formless," "empty," and "dark" summarize the activity of the six days (vv. 3-31)? The answer is, "No." In fact, it describes the opposite. Now, for the next question: Can we see a sequential or progressive relationship between these first two verses and the rest of the creation story? The answer is, "Yes." What is "dark" in verse 2 is illuminated in verse 3, what is "formless" in verse 2 is formed and fashioned in verses 3-31, what is "empty" in verse 2 is filled with living things in verses 11-31. This sequential progression plainly indicates that Genesis 1:1-2 describes activity (v. 1) and a state (v. 2) prior to the first formative day. That being the case, we can say with assurance that the original creation *ex nihilo* (recorded in verse 1) took place before the first of the six formative days began. This is confirmed to us by the fact that there is no indication of *ex nihilo* creation during the six-day period. If we look at the activity of each of the six days, we see this is true. Light was the first thing produced during the six days, but we know that the existence of light presumes the existence of matter (remember Einstein's special theory of relativity), not to mention the fact that space would also have to be present in which the light could travel. Likewise the separating of the terrestrial and atmospheric waters, and the gathering of the terrestrial waters into oceans was a rearrangement of existing space and matter. The stars were "made" (Heb. *'asah*, "formed" – this term is never used for creation *ex nihilo*), and the living plants and animals were made from the pre-existing materials of the earth.

A common objection to the position just given is that according to Exodus 20:11, all of God's creative activity (including the creation *ex nihilo*) was performed within the six-day period. Exodus 20:11 says, "For in six days the LORD made the heavens and the earth, the sea, and all that is in them..." However, when we examine Exodus 20:11 we find that the word "made" is the Hebrew term *'asah*, meaning "to form" – a term used for mediate creation (*i.e.*, formative action upon existing material). This word would not be the proper term to describe creation *ex nihilo*. The correct understanding of this passage is that the formative activity was six days in duration, but it does not say the original *ex nihilo* creation was part of the six days; in fact, it says nothing about the *ex nihilo* creation at all.

The words translated "made" and "created" were very carefully chosen when this account was recorded. *Bara'* is usually translated "create" and has a broad range of meaning, just like the English word "create." It can be used of immediate (*ex nihilo*) creation, or mediate creation (*i.e.*, the forming of existing material into something new). In the creation account in

Genesis the word *bara'* occurs in 1:1,21,27 (twice), and in 2:3 (to summarize the entire process). '*Asah* is usually translated to "make," or "create," but has a much more narrow meaning than *bara'*. It is only used of mediate creation (*i.e.*, the forming of existing materials into something new). In the Genesis account it occurs in 1:7,16,25,26, and 31. The usage and relationship of these two words is similar to the relationship between the English words "create" and "make." Now, we come to the tricky part. Whereas *bara'* can be used to substitute for '*asah* (since *bara'* is a more comprehensive term), '*asah* can only be used where *ex nihilo* creation is not in view. So, there is a very limited interchangeability between these words. This explains why several occurrences of *bara'* (vv. 21 and 27 [2x]) and every occurrence of '*asah* in this passage refers to *mediate* creation, even though *bara'* in 1:1 clearly refers to the *ex nihilo* creation. Needless to say, an unclear understanding of this relationship can result in a great deal of confusion over what Genesis One actually says.

Now, when we summarize what the Bible actually says about creation, these are the key points: 1) The original creation of the heavens and earth (*ex nihilo*) is stated to have occurred prior to the beginning of the first day of Genesis One. We have absolutely no way of knowing, from the Bible, how much time might have lapsed between the original creation (1:1-2) and the beginning of the first day (1:3). Hence, we cannot know, from the Bible, the age or even the approximate age of creation. Science may be able to give us an estimate of the age of the universe; otherwise we would simply have to regard it as an open question. 2) The activity recorded during the six days of Genesis was formative in nature – involving *mediate* rather than *immediate* (*ex nihilo*) creation. 3) Even though the original creation of the universe might have been eons ago, the six-day formative activity would have ended only recently (less than ten thousand years ago) with the creation of man in order to mesh with biblical history. 4) Scientific estimates of the age of the universe in billions of years are not averse to a literal understanding of the Bible. However, estimates that place man prior to the limits of biblical history would not be consistent with a normal understanding of the Bible. Obviously a great deal hinges on how much weight one is willing to place on modern scientific dating (which is mostly radiometric, and which should be viewed with great caution).

In light of this discussion, one might ask, "Which reconciliation theory is best?" The answer would have to be the theory that best fits with a normal understanding of the biblical text, and the well-established observations of science (but not necessarily every scientific opinion, theory, or set of dates). Based on those criteria we would exclude the gap theory, the evolutionary day-age theory, and recent creationism as incompatible with the biblical account. We would also exclude recent creationism as incompatible with well-established scientific observations. That leaves progressive creationism, a vague literary framework theory, and the preformative theory, or some combination of these theories.

### **Addendum: The History of Modern Theoretical (Scientific) Cosmology**

While our discussion has been principally concerned with what the *Bible* says about the origin of the universe, it is important to know how this information fits with modern theoretical (scientific) cosmology – since any biblical theory that is seriously at odds with sound scientific observation would likely be problematic.

From the time of Aristotle (c. 300 B.C.) to the early 19<sup>th</sup> century, the secular view of the universe was that it is infinite and eternal. This was very convenient, since an eternal universe requires no explanation of its origin. However, this theory posed problems. If the universe were infinite in all directions there should be stars at every point in the sky (at some distance), and if it were eternal, there would have been time for the light from all those stars to reach the earth. Therefore, if the universe were infinite and eternal, the night sky should be much brighter. Since the night sky is not bright, it is apparent that the universe could not be infinite and eternal. This realization, in the early 1900s, led to another view called, the "steady state theory." The steady

state theory said that the universe is eternal and that stars are being born and dying in a perpetual cycle. This theory accounted for why the night sky is not bright (stars eventually die out), and it required no Creator and thus fit with purely naturalistic assumptions about reality. The problem with this theory turned out to be the second law of thermodynamics, which says that over time, in any physical system, there is an increase of entropy (spent, or dissipated energy, which has less potential to do useful work). If the universe were eternal, then it would have had eternity for the useful energy level to reach zero; thus, the universe would be very cold and totally dark. In spite of this difficulty, most physicists subscribed to some form of the steady state theory well into the 1950s and '60s, because this best fit with naturalistic (monistic, or antismetaphysical) assumptions shared by most physicists at the time. In the early 1900s a growing body of evidence had begun to point to an expanding universe, but this evidence was largely ignored by science. In 1914 Vesto Slipher presented evidence that several nebulae were receding away from the earth. In 1915 Einstein's General Theory of Relativity predicted an expanding universe. However, Einstein simply zeroed out this expansion with a purely arbitrary "cosmological constant." (Einstein later called this the biggest mistake of his career.) In 1922 Alexander Friedman, a Russian mathematician, predicted the expansion of the universe, and in 1929 Edwin Hubble proposed the Law of Red Shifts, based on the observation that the light spectrums of galaxies is more shifted toward the red (long wavelength) end of the spectrum the further they are from the earth. The problem with an expanding universe is that it implied a definite age limit for the universe, since it couldn't have been expanding forever. (All you have to do to see this is to imagine a film of the universe's history run backwards—the universe could only shrink until its volume reached zero, which would be the point of its beginning.) Of course if the universe is not eternal, then it must have had a beginning. This is precisely what was penned in the opening verses of the book of Genesis, over thirty-five hundred years ago. Scientists and natural philosophers recognized that a universe with a beginning was highly problematic to naturalism, scientism, and atheism. Obviously, if the universe had a beginning, it could not have created itself. So, the implication is clearly that something (or someone) outside of the universe—something eternal—must ultimately be responsible for the existence of the universe. What a dilemma; naturalistic science was on the verge of providing a powerful reason to believe in the existence of something eternal which was completely outside the universe—something sufficient to be the cause of all that exists, but requiring no explanation for its own existence! The implications of an absolute beginning to the natural realm would be a stunning defeat for naturalism—a defeat that the naturalistic scientific community absolutely could not allow to happen. In fact, one of the classic arguments for the existence of God, the cosmological argument, said just that—that the existence of the universe implies the existence of something (or someone) eternal, since something cannot come from nothing. So, scientists tried as best they could to avoid the inflationary (big bang) view. However, in 1965 two Bell scientists measured a 3 degree Kelvin excess antenna temperature in all directions in which they pointed their microwave antenna. This figure coincided very closely with the predicted residual temperature that would have been left over from a cosmic "big bang" origin. Later evidence provided by the Cosmic Background Explorer (COBE) satellite in 1990-92, and the Wilkinson Microwave Anisotropy Probe (WMAP) 2000-present have confirmed even more closely the theoretical predictions of a "hot big bang" origin of the universe. Since the mid-1960s naturalistic scientists have found themselves in a dilemma. They cannot, under any circumstance, acknowledge an absolute beginning of the universe (out of nothing), yet all the evidence of a "big bang" origin of the universe is now quite beyond dispute. They have been left with only one alternative: they must either cast doubt on the evidence for the "big bang" (which is becoming increasingly more difficult to do, since each new discovery just seems to confirm the obvious), or they have to continue to argue that some natural process is eternal, and therefore no supernatural cause is required. Of course the perceptive reader will recognize that this discussion crossed over from science to philosophy and theology long ago. The fact that scientific cosmology has landed precisely in the same spot as the Bible has indeed been disturbing to most naturalistic scientists

and philosophers (most of whom are atheists and have an obvious interest in the issue far beyond the bounds of science). Since an absolute origin is highly problematic for purely naturalistic thinkers, a number of theories have been put forth to try to get around the implications of the big bang theory. One alternate theory has been the “oscillation” theory. This theory suggests that the universe has gone through an infinite number of expansions and contractions (crunches), and is – after all – eternal, and therefore needs no explanation for its origin. Not unsurprisingly, the problem with the oscillation theory is the same as with the steady state theory. The second law of thermodynamics says that no physical process can go on forever; it will eventually “wind down.” Two other problems with this theory are that the universe probably doesn’t have enough mass to contract, and if it did contract, its low mechanical efficiency (possibly as low as 0.00000001%) would not result in a subsequent expansion. More recently the Hartle-Hawking model suggests that some eternal phenomenon was in place prior to the emergence of the present physical laws, and this phenomenon accounts for the origin of the universe. Stephen Hawking calls this phenomenon, “imaginary time” – and, as you will see, it is quite appropriately named. Given “imaginary time,” Hawking hypothesizes that the universe could have emerged out of nothing, all by itself, with no need for a Creator. In his book, *The Universe in a Nutshell* (Bantam Books, 2001), Hawking assures his readers that imaginary time does exist (see chapter four). This assertion has confused many people – including some scientists – who simply assume that someone as brilliant as Hawking wouldn’t make such a statement if it were not provable – yet that is exactly what Hawking does. One of the fundamental concepts of big bang physics is that no scientific statements can be made about anything prior to time zero. Why? Because we can’t make any scientific statements about anything prior to the existence of the present physical laws upon which science is based. So, how does Hawking “know” that imaginary time exists? In the first three chapters of *The Universe in a Nutshell* he delicately weaves an assumption into his discussion; that assumption is that science demands a natural (*i.e.*, non-supernatural) explanation for everything. (This is, of course, the bedrock of all natural/monistic philosophy.) Given the compelling evidence for an inflationary “big bang,” any natural explanation of the origin of the universe would require a quantum event (since, at its beginning, the universe would have to be infinitely small), and since quantum events require time, Hawking hypothesizes that some kind of time must have existed (*i.e.*, “imaginary time”) before the emergence of real time (which began at the moment of the big bang). With this, Hawking proceeds to explain how the universe might have emerged out of nothing (that is, nothing other than imaginary time). The problem, of course, is that this isn’t science at all; it’s just more naturalistic philosophy – the same naturalistic philosophy that blinded most scientists to the truth of an inflationary universe to begin with. Has Hawking proven a purely naturalistic origin of the universe? Emphatically not! He has done nothing more than a very clever job of concealing his naturalistic starting assumption and hoping the readers would get lost in so many details of post time-zero physics that they wouldn’t notice it was all based upon a mere unproven – indeed *unprovable* assumption. In a last ditch effort to escape the inevitable conclusion that the universe was created out of nothing, other physicists have been working for the past forty years on string theory (“M” theory, etc.) models in an effort to support the notion of an infinite universe requiring no origin. However, any such model must reconcile with the evidence of an expanding universe. (How could an infinite universe expand?). Undoubtedly we are destined to see some highly “creative” mathematics employed in this effort.

The present state of scientific cosmology is this: The universe, as we know it, as described by the laws of physics, had a beginning. That beginning encompasses everything we know, including: time, matter, energy, and all physical law (which includes quantum mechanics as well as relativity and any, as yet undiscovered unification principles). Science can make no authoritative statements about what might have preceded the universe’s creation, since such statements would have no basis in physical law. As far as theoretical cosmology is concerned, we have finally reached a roadblock. While scientists will undoubtedly continue to suggest what might have happened “if such and such were true,” they cannot go back further than the moment

of creation—actually a few moments *after* the creation when physical law originated. Therefore, science will never know any more about conditions prior to creation than it knows right now— which is absolutely nothing. This is a permanent limitation. Needless to say, some will undoubtedly claim to find a way to ascertain the unknowable starting conditions of the big bang, but such attempts must always be based upon assumptions, no matter how cleverly hidden. Science is simply at the end of the road, it can do no more than theorized, and confirm or deny, what might have happened *after* the moment of creation; any claim beyond that can only be an intellectual hoax in scientific garb. Having already seen that many in the scientific community have shown themselves willing to disregard fundamental physical laws in order to maintain their naturalistic assumptions, as is the case with both the steady state theory and later the oscillation theory, we shouldn't be surprised to hear assurances that they now "know" the initial starting conditions of the big bang—and that those initial conditions do not require anything supernatural. Hum...is there a tail wagging this dog?

Adapted from, *An Outline of Bible Doctrine*, by Sam A. Smith  
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Originally published online at *Biblical Reader Communications*, January 2005, Revised December 2013  
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