APPENDIX FOUR

VARIOUS VIEWS OF THE "DAYS" OF GENESIS

There are two major views with regard to the time involved in Creation: the old earth view and the young-earth view. The latter believes the universe is no more than approximately 15,000 years old, while the former holds that it is probably about 15,000,000,000 years old.

Young-earthers take the "days" of Creation to be six successive, literal, solar days of twenty-four hours each, totaling 144 hours of Creation. They also reject any significant time gaps between the accounts in Genesis 1 or within the genealogies in Genesis 5 and 11.[1]

THE SIX TWENTY-FOUR-HOUR-DAY VIEW OF CREATION

Not all scholars who take the days of Genesis to be twenty-four hour days are young-earthers (some hold a gap theory); however, all who hold to a young earth hold to the twenty-four-hour-day view.

Arguments Offered for the Twenty-Four-Hour-Day View

There are many biblical arguments presented in favor of the twenty-four-hour-day position. These include the following.

The Normal Meaning of the Word Day (*Yom*)

It is contended that the usual meaning of the Hebrew word *yom* ("day") is twenty-four hours unless the context indicates otherwise. The context does not indicate anything but a twenty-four-hour-day in Genesis 1; hence, the days should be taken as solar days.

The Use of Numbered Series

Further, it is noted that when numbers are used in a series (1, 2, 3 …) in connection with the word *day* (*yom*) in the Old Testament, it always refers to twenty-four-hour-days. The absence of any exception to this in the Old Testament is given as evidence of the fact that Genesis 1 is referring to twenty-four-hour-days.

The Use of "Evening and Morning"

Another line of evidence is the use of the phrase "evening and morning" in connection with each day in Genesis 1. Since the literal twenty-four-hour-day on the Jewish calendar began in the "evening" (*by* sunset) and ended in the "morning" (*before* sunset) the next day, it is concluded that these are literal twenty-four-hour-days.

[1] See article on "Genealogies, Open or Closed" in Geisler, *Baker Encyclopedia of Christian Apologetics.*

The Comparison With a Six-Day Workweek

According to the law of Moses (Ex. 20:11), the Jewish workweek (Sunday through Friday) was to be followed by a day of rest on Saturday, just as God had done in His "six-day week" of creation. The Jewish workweek refers to six successive twenty-four-hour-days. This being the case, it seems that the creation week, like the workweek, was only 144 hours long.

Life Cannot Exist for Thousands of Years Without Light

Young-earthers claim that according to Genesis 1, light was not made until the fourth day (v. 14), but there was life on the third day (v. 1:11–13). However, life on earth cannot exist for millions (or even thousands) of years without light; thus, the "days" must not have been long periods of time.

Plants Cannot Live Without Animals

Plants were created on the third day (1:11–13), and animals were not created until later (1:20–23). There is a symbiotic relation between plants and animals, one depending on the other for its life. For example, plants give off oxygen and take in carbon dioxide, and animals do the reverse. Therefore, plants and animals must have been created closely together, not separated by long periods of time.

The Old Earth View Implies Death Before Adam

According to the old-earth position, there was death before Adam. Nevertheless, the Bible declares that death came only after Adam, as a result of his sin: "Just as sin entered the world through one man, and death through sin, and in this way death came to all men, because all sinned" (Rom. 5:12; cf. 8:20–22).

The Old-Earth View Is an Accommodation to Evolution

It is well known that the theory of evolution (or common ancestry) depends on very long periods of time for life to develop from a one-celled animal to human beings. Without these long periods of time, evolution would not be possible. Thus, it is argued by young-earthers that granting long periods of time is an accommodation to evolution.

Mark 10:6 Affirms That Adam and Eve Were Created at the Beginning

According to this text, "At the beginning of creation God 'made them male and female.' "If God created humankind at the beginning of Creation, then they were not created at the end of millions of years, as the old-earth view contends.

A Response to the Arguments Offered for the Twenty-Four-Hour-Day View

In spite of the fact that many find these arguments convincing proof of six successive twenty-four-hour-days of Creation, the case is less than definitive for several reasons. Those who reject the six-successive-solar-day view reply as follows.

The Normal Meaning of the Word Day (*Yom*)

It is true that most often the Hebrew word *yom* ("day") means "twenty-four hours." However, this is not definitive for its meaning in Genesis 1 for several reasons.

First, the meaning of a term is not determined by majority vote, but by the context in which it is used. It is not important how many times it is used elsewhere, but how it is used here.

Second, even in the creation story in Genesis 1–2, "day" (*yom*) is used of more than a twenty-four-hour period. Speaking of the whole six "days" of creation, Genesis 2:4 refers to it as "the day" (*yom*) when all things were created.

Third, and finally, *yom* is elsewhere used of long periods of time, as in Psalm 90:4, which is cited in 2 Peter 3:8: "A day is like a thousand years."

The Use of Numbered Series

Critics of the twenty-four-hour-day view point out that there is no rule of the Hebrew language demanding that all numbered days in a series refer to twenty-four-hour-days. Further, even if there *were* no exceptions in the rest of the Old Testament, it would not mean that "day" in Genesis 1 does not refer to more than a twenty four hour period of time: Genesis 1 may be the exception! Finally, contrary to the solar-day view, there is another example in the Old Testament of a numbered series of days that are not twenty-four-hour-days. Hosea 6:1–2 reads: "Come, let us return to the LORD. He has torn us to pieces but he will heal us; he has injured us but he will bind up our wounds. After two days he will revive us; on the third day he will restore us, that we may live in his presence." It is clear that the prophet is not speaking of twenty-four-hour "days," but of longer periods of time in the future. Even so, he uses numbered days in a series.

The Use of "Evening and Morning"

First, the fact that the phrase "evening and morning" is *often* used in connection with twenty-four-hour-days does not mean it must *always* be used in this way.

Second, if one is going to take everything in Genesis 1 in a strictly literal way, then the phrase "evening and morning" does not encompass all of a twenty-four-hour-day, but only the late afternoon of one day and the early morning of another. This is considerably less than twenty four hours.

Third, technically, the text does not say the "day" was composed of "evening and morning" (thus allegedly making a twenty four hour Jewish day); rather, it simply says, "And there was evening, and there was morning—the first day" (Gen. 1:5). Further, the phrase may be a figure of speech indicating a beginning and end to a definite period of time, just as we see in phrases like "the dawn of world history" or the "sunset years of one's life."

Fourth, if every day in this series of seven is to be taken as twenty-four hours, why is the phrase "evening and morning" not used with one of the days (the seventh)? In fact, as we shall see (below), the seventh day is not twenty-four hours, and thus there is no necessity to take the

other days as twenty four hours either, since all of them alike use the same word (*yom*) and have a series of numbers with them.

Fifth, and finally, in Daniel 8:14, "evenings and mornings" (cf. v. 26) refer to a period of 2,300 days. Indeed, often in the Old Testament the phrase is used as a figure of speech meaning "continually" (cf. Ex. 18:13; 27:21; Lev. 24:3; Job 4:20).

The Comparison With a Six-Day Workweek

It is true that the creation week is compared with a workweek (Ex. 20:11); however, it is not uncommon in the Old Testament to make unit-to-unit comparisons rather than minute-for-minute ones. For example, God appointed forty years of wandering for forty days of disobedience (Num. 14:34). And, in Daniel 9, 490 days equals 490 years (cf. 9:24–27). What is more, we know the seventh day is more than twenty-four hours, since according to Hebrews 4 the seventh day is still going on. Genesis says that "on the seventh day [God] rested" (Gen. 2:2), but Hebrews informs us that God is still in that Sabbath rest into which He entered after He created: "There remains, then, a Sabbath-rest for the people of God; for anyone who enters God's rest also rests from his own work, just as God did from his" (Heb. 4:10).

Life Cannot Exist for Thousands of Years Without Light

Light was not created on the fourth day, as defenders of the solar day argue; rather, it was made on the very first day when God said, "Let there be light" (Gen. 1:3). As to why there was light on the first day when the sun did not appear until the fourth day, there are various possibilities. Some scholars have noted a parallelism between the first three days (light, water, and land—all empty) and the second three days (light, water, and land—all filled with bodies). This may indicate a parallelism in which the first and fourth days cover the same period, in which case the sun existed from the beginning.

Others have pointed out that while the sun was *created* on the first day, it did not *appear* until the fourth day. Perhaps this was due to a vapor cloud that allowed light through, but not the distinct shape of the heavenly bodies from which the light emanated.

Plants Cannot Live Without Animals

Some plants and animals are interdependent, but not all. Genesis does not mention all the plants and animals, but only some. If the "days" are six successive periods, then those forms of plant and animal life that need each other could have been created together. In fact, the basic order of events is the order of dependence. For instance, many plants and animals can exist without humans (and they were created first), but humans (who were created on the sixth day) cannot exist without certain plants and animals. In addition, if the "days" are parallel, then the problem does not exist, since plants and animals would exist at the same time. In any event, the argument from the symbiotic relation of plants and animals does not prove that the six "days" of Genesis 1 must be only 144 hours in duration.

The Old-Earth View Implies Death Before Adam

There are several problems with this argument.

First, Romans 5:12 does not say *all animals* die because of Adam's sin, but only that "all men" die as a consequence.

Second, Romans 8 does not say that animal death results from Adam's sin, but only that the "creation was subjected to frustration" as a result of it (v. 20).

Third, if Adam ate anything—and he had to eat in order to live—then at least plants had to die before he sinned.

Fourth, and finally, the fossil evidence indicates animal death before human death, since people are found only on the top (later) strata while animals are found in lower (earlier) strata.

The Old-Earth View Is an Accommodation to Evolution

In response to this charge, it must be observed that allowing for long periods of time for the development of life came long before the idea of evolution. Augustine (354–430), for one, held to long periods of time for the development of life (*CG*, 11.6).

Also, even in modern times, scientists had concluded that long periods of time were involved before Darwin wrote in 1859.

Furthermore, long periods of time do not help evolution, since without intelligent intervention, more time does not produce the specified complexity involved in life. Natural laws randomize, not specify. For example, dropping red, white, and blue bags of confetti from a plane at 1,000 feet in the air will never produce an American flag on the ground. Giving it more time to fall by dropping it at 10,000 feet will diffuse it even more.

Mark 10:6 Affirms That Adam and Eve Were Created at the Beginning

First, Adam was not created at the *beginning* but at the *end* of the creation period (on the sixth day), no matter how long or short the days were.

Second, the Greek word for "create" (*ktisis*) can and sometimes does mean "institution" or "ordinance" (cf. 1 Peter 2:13). Since Jesus is speaking of the institution of marriage in Mark 10:6, it could mean "from the beginning of the institution of marriage."

Third, and finally, even if Mark 10:6 is speaking of the original creation events, it does not mean there could not have been a long period of time involved in those creative events.

THE "DAYS" OF GENESIS MAY INVOLVE LONG PERIODS OF TIME

Other orthodox Christians believe that the "days" of Genesis 1 may involve significant periods of time. They offer two lines of evidence in support of this view: biblical and scientific.

The Biblical Evidence for Long Days in Genesis

There are many indications within the text of Scripture to support the belief that the creation "days" were longer than twenty-four hours. The following are those most often given in support of this position.

The Word Day (Yom) Often Means a Long Period of Time

The fact is that the same word that can mean twenty-four hours also often means a longer period of time. First of all, "day" sometimes means a prophetic day; that is, a future time period of differing lengths, as in "the day of the Lord" (Joel 2:31; cf. 2 Peter 3:10). Furthermore, as we have seen, 2 Peter 3:8—"A day is as a thousand years"—is based on Psalm 90:4: "A thousand years in your sight are like a day that has just gone by." As with any other word, the meaning of the word *day* must be determined by the context in which it is used. In many contexts, "day" means much more than twenty-four hours. It can mean thousands, or even more.

The Word Day Is More Than Twenty-Four Hours Even in Genesis 1–2

Even in the creation passage, *yom* is used of a period of time longer than twenty-four hours. Summing up the entire six "days," the text declares: "This *is* the history of the heavens and earth when they were created, in the day [*yom*] that the LORD God made the earth and the heavens" (Gen. 2:4 NKJV). "The day" here means six "days," which indicates a broad meaning of the word *day* in the Bible, just as we have in English.

The Seventh "Day" Is Thousands of Years Long

Everyone agrees that it has been at least thousands of years since the time of creation, yet the Bible declares that God rested on the seventh day after His six days of creation (Gen. 2:2–3). According to the book of Hebrews, God is still in His Sabbath rest from creation (4:3–5); hence, the seventh day has been at least six thousand years long, even on the shortest of all the chronologies of humankind.

The Third "Day" Is Longer Than Twenty-Four Hours

On the third "day," God not only created vegetation, but it grew to maturity. The text says that on the third day "the land *produced vegetation:* plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds" (Gen. 1:12, emphasis added). To grow from seeds to maturity and produce more seeds is a process that takes much longer than a day, a week, or even a month for most plants. There is no indication in the text that its *growth* was anything but natural; it is its *origin* that was supernatural.

The Sixth "Day" Is Longer Than Twenty-Four Hours

It would also appear that the sixth "day" of creation was considerably longer than a solar day. Consider everything that happened during this one "day."

First, God created all the many hundreds (or thousands) of land animals (Gen. 1:24–25).

NKJV New King James Version of the Bible

Second, God "formed" man of the dust of the earth (Gen. 2:7). This Hebrew word (*yatsar*) means "to mold" or "form," which implies time. *Yatsar* is used specifically of the work of a potter (cf. Jer. 18:2f.).[2]

Third, God said, "I *will* make a helper suitable for him" (Gen. 2:18, emphasis added). This indicates a time subsequent to the time of the announcement.

Fourth, Adam observed and named this whole multitude of animals (Gen. 2:19). As Robert Newman noted, "If every one of the approximately 15,000 living species of such animals (not to mention those now extinct) were brought to Adam to be named, it would have taken ten hours if he spent only two seconds on each."[3] This is hardly enough time for Adam to study each animal and determine an appropriate name for it. Assuming a minimum of only two minutes each, the process would have taken six hundred hours (or twenty-five days).

Fifth, Adam searched for a helpmate for himself, apparently among all the creatures God had made. "But for Adam no suitable helper *was found*" (implying a time of searching) (Gen. 2:20, emphasis added).

Sixth, God put Adam to sleep and operated on him, taking out one of his ribs and healing the flesh (Gen. 2:21). This too involved additional time.

Seventh, Eve was brought to Adam, who observed her, accepted her, and was joined to her (Gen. 2:22–25).

In conclusion, it seems highly unlikely that all of these events—especially the fourth one—were compressed within a twenty-four-hour period or, more precisely, within the approximately twelve hours of light each day afforded.

The Scientific Evidence for Long Days in Genesis

In addition to the biblical evidence for long periods of time, there are scientific arguments that the world has existed for billions of years. The age of the universe is based on

(1) the speed of light and the distance of the stars;
(2) the rate of expansion of the universe;
(3) the fact that early rocks have been radioactively dated in terms of billions of years;
(4) the rate that salt runs into the sea and the amount of salt there, which indicates multimillions of years.

While all of these arguments have certain unprovable presuppositions, nonetheless, they may be true and, hence, point to a universe that is billions rather than thousands of years in age (see Ross, *CT*).

[2] See Robert C. Newman and Herman Eckelmann Jr., *Genesis One and the Origin of the Earth*, 128–29.

[3] Ibid.

OTHER VIEWS OF THE "DAYS" OF GENESIS

If, of course, the "days" of Genesis *are* long periods of time, there is no conflict with modern science on the age of the earth. Nevertheless, even if the "days" of Genesis are twenty-four hours, there are still many ways to reconcile long periods of time with Genesis 1–2.

The Revelatory-Day View

Some conservative scholars have suggested that the "days" of Genesis may be twenty-four-hour days of *revelation*, not days of *Creation* (see Wiseman, *CRSD*, all). That is, they propose that it took God a literal solar week (of 144 hours) to reveal to Adam (or Moses) what He had done in the long ages before humans were created. Even in the Exodus passage (20:11) that speaks of the heavens and earth being "made" (*asah*) in six days, the word can mean "revealed." Just as a prophet can get revelation from God looking forward to a future series of events (cf. Dan. 2, 7, 9; Rev. 6–19), even so God can reveal a past series of events to one of His servants. Indeed, Moses was on Mount Sinai for forty days (Ex. 24:18), and God could have taken six of these days to reveal the past creation events to him. Or, after God created Adam, He could have taken six literal days to reveal to him what He had done before Adam was created. Some scholars believe this material could have been memorized and passed on as the first "account of the heavens and the earth" (Gen. 2:4), just as the other "histories" (or "genealogies") were apparently recorded and passed on (cf. Gen. 5:1; 6:9; 10:1; etc.).

The Alternate-Day-Age View

Other evangelical scholars have suggested that the "days" of Genesis are twenty-four-hour periods of time in which God created the things mentioned, but that they are separated by long periods of time in between. This would account for the indications in Genesis 1 that these are twenty-four-hour days (like numbered days and "evening and morning"), while at the same time leaving room for the geological ages demanded by modern science.

Gap Theories

C. I. Scofield (1843–1921) made popular the view that there could be a great gap of time between the first two verses of the Bible into which all of the geological ages fit. In this way, the "days" could be twenty-four hours each, and yet the world could still be many millions of years old or more.

Others believe that there may be a "gap" or, better, a lapse of time before the six twenty-four-hour days of Genesis begin. In this case, the first verse of the Bible would not necessarily indicate the original *ex nihilo* creation of God, but more recent acts of God forming a world He had previously created (see Waltke, *CAG*, all).

The Ideal-Time View

There is also a position variously known as the prochronism, apparent-age, or ideal-time view. According to this perspective, the earth and all living things were created with the appearance of

age (see Gosse, *O*, chapters 6–7)—that is, they were created mature. For example, Adam may have looked twenty-one years old a minute after he was created, but he was really only a minute old. Likewise, it is argued that Adam may have had a naval, like all his descendants do, even though he was never connected by an umbilical cord to a mother. Also, it is theorized that the first trees may have been created with rings in them rather than receiving them from annual growth. If this is so, then the world can be actually young and only apparently very old.[4]

The Literary-Framework View

Still others, like Herman Ridderbos (b. 1900), have suggested that the use of "days" and "evening and morning" are merely ancient literary devices to frame certain periods of time in order to encapsulate them in literary form much like we use a "chapter" to do the same. It is reasoned that since evening and morning were natural ways to point to a period of time with a beginning and an end, this was an appropriate way for God to reveal to Adam (or Moses) what He had done in certain periods of time before humans arrived on the scene.

In summary, there are numerous ways that one can account for long periods of time and still accept a literal understanding of Genesis 1–2. That is, one does not have to give up the normal historical-grammatical way of interpreting the Bible in order to embrace these views. Therefore, there is no necessary conflict between Genesis and the belief that the universe is millions or even billions of years old. Indeed, of all the ways of interpreting Genesis 1–2, only the "religious only" or "myth" view is flatly incompatible with an evangelical understanding of Scripture, since it rejects that Genesis 1 is providing literal information about the origin of the space-time universe and all living things.

[4] This view appears to charge God with deception, since He is alleged to make the world look old when it actually is not. Further, it is contrary to common sense and the scientific arguments for an old universe.

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APPENDIX FIVE

THE AGE OF THE EARTH

There seems to be no way to actually prove how old the universe really is, either from science or from the Bible, for there are known and possible gaps in the biblical genealogies (see below). In addition, there are unprovable presuppositions in most, if not all, the scientific arguments for an old earth (see below); that is, an earth of millions or billions of years is biblically possible but not absolutely provable.

Gaps in the Biblical Record

Bishop James Usher (1581–1656), whose chronology was used in the old *Scofield Reference Bible*, argued that Adam was created in 4,004 B.C. However, his calculations are based on the assumption that there are no gaps in the genealogical tables of Genesis 5 and 11, while we know this is false. For instance, the Bible says: "Arphaxad … became the father of Shelah" (Gen. 11:12), but in Jesus' genealogy in Luke 3:35–36, "Cainan" is listed between Arphaxad and Shelah. If there is one gap, there may be more—indeed, we know there *are* more. For example, Matthew 1:8 says: "Jehoram the father of Uzziah," but the parallel listing in 1 Chronicles 3:11–14 illustrates missing generations between Jehoram and Uzziah (Azariah), namely, Ahaziah, Joash, and Amaziah. Just how many gaps there are in biblical genealogies and how much time they represent is not known. Even so, gaps there are and, hence, *complete* chronologies cannot be made; only *accurate* genealogies (lines of descent) are given.

Presuppositions in the Scientific Arguments

There are many scientific arguments for an old universe, some of which one may find persuasive. However, none of these is foolproof, and all of them may be wrong. A few examples will illustrate the point of why we should not be dogmatic one way or the other.

The Speed of Light Is Not Guaranteed

In spite of the facts that Albert Einstein (1879–1955) considered it to be absolute and that modern science has held it to be unchanging, it has not been proven that the speed of light has never changed. The speed of light (about 186,000 miles per second) is an assumption for many arguments favoring an old earth. However, *if* the speed of light is constant, and *if* God did not also create the light rays when He created the stars, then it would appear that the universe is billions of years old, for it has apparently taken millions of years for that light to get to us. Nevertheless, these are big "ifs" that have not been proven, and they would actually appear to be unprovable. So while the arguments from the speed of light to an old universe may seem plausible, they fall short of being a demonstrable proof.

Radioactive Dating

It is well known that the elements U235 and U238 give off lead isotopes at a known rate per year. By measuring the amount of their deposit, one can calculate when the decay began. Many early rocks in the earth's crust have been dated in billions of years by this method. But, again, as plausible as this may be, it is not a proven fact, for one must assume at least two things that apparently cannot be proven in order to come to the conclusion that the world is billions of years old.

First, it must be assumed that there were no lead deposits at the beginning.

Second, it must be assumed that the rate of decay has been unchanged throughout its entire history. This has not been proven; hence, radioactive dating has not proved beyond all doubt that the world is billions of years old.

The Amount of Salt in the Sea

The same is apparently true of all arguments for an old earth. For example, the oceans have a known amount of salt and minerals in them, and these go into the ocean at a given rate every year. By simple mathematics, it can be determined how many years this has been going on. However, here also it must be assumed (1) that there were no salts and minerals in the ocean to begin with, and (2) that the rate has not changed over the years. A worldwide flood, such as the Bible describes, would certainly have changed the rate of deposits during that period.

All of this is not to say that the universe is not billions of years old—it may be. However, this has not been proven beyond question, and the arguments given in favor of it all possess presuppositions that have not been or cannot be proven. Nonetheless, given the basics of modern physics, it seems plausible that the universe is billions of years old. And, as shown above, there is nothing in Scripture that contradicts this. With that in view, the following conclusions are appropriate:

(1) There is no demonstrated conflict between Genesis 1–2 and scientific fact.
(2) The real conflict is not between God's *revelation* in the Bible and scientific *fact*; it is between some Christians' *interpretation* of the Bible and many scientists' *theories* about the age of the world.
(3) Science has not proven that a six-successive-twenty-four-hour-day view is impossible.
(4) A literal interpretation of Genesis is consistent with a universe that is billions of years old.
(5) Since the Bible does not say exactly how old the universe is, the age of the earth should not be a test for orthodoxy. In fact, many orthodox scholars have held the universe to be millions of years old or more (such as Augustine, B. B. Warfield, C. I. Scofield, John Walvoord, Francis Schaeffer, Gleason Archer, Hugh Ross, and most of the leaders of the movement that produced the famous "Chicago Statement" [1978] on the inerrancy of the Bible [see *Systematic Theology*, Volume 1, chapters 14 and 27]).

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APPENDIX SIX

THE SCIENTIFIC EVIDENCE FOR CREATION

The scientific evidence for creation is found in three different areas. *First*, there is the scientific evidence for the creation of the physical universe.

Second, there is the scientific evidence for the creation of first life.

Third, there is the scientific evidence for the creation of all basic life forms, including human beings.

OPERATION (EMPIRICAL) SCIENCE VERSUS ORIGIN (FORENSIC) SCIENCE

Before this evidence is examined, it is necessary to distinguish two basic kinds of science, one dealing with the *present* world and the other with the *past*. The first is called *operation science*, the other, *origin science* (see Geisler and Anderson, *OS*, chapters 6–7). Operation science is an *empirical* science; origin science is more like a *forensic* science. Operation science deals with present regularities, while origin science deals with past singularities. The latter deals with the *origin* of the universe and life, and the former deals with its *functioning*.

The crucial difference between origin and operation science is that in operation science there is a recurring pattern of events against which a theory can be tested. In origin science, there is no such recurring pattern in the present, since it deals with a past singularity. Hence, there is no direct way to test a theory or model of origin science: It must be judged as plausible or implausible on how consistently and comprehensively it reconstructs the unobserved past on the basis of evidence available in the present.

The basic principles of these two kinds of science are also different. Operation science is based on *observation* and *repetition*. The laws of physics and chemistry, for example, are founded on the observation of some recurring patterns of events. Such observations can be made with the naked eye or with the aid of instruments, such as the telescope and microscope. *Observation is crucial to operation science*—there must be a repetition or recurring pattern to be observed. No empirical scientific analysis can be made on the basis of a singular event, for operation science involves not only *present* regularities but also *future* ones that can be projected from a present pattern. Again, no scientific trend or prediction can be made from a singular event; it takes a series or pattern of events before a valid scientific law can be posited or a projection can be made.

Origin science, on the contrary, is not based on either the observation or repetition of the events of origin, since we did not observe them, nor are they being repeated in the present. So origin science deals with unobserved past singularities, such as the origin of the universe and the origin of life. Since no human was there to observe the *origin* of life, it is not the subject of *operation* science. The operation of the cosmos, for example, is the science of *cosmology*, but the origin of the cosmos is the science of *cosmogony*. The former deals with its present operation; the latter treats the genesis of the world. The operational science of biology does not deal with the *beginning* of life, but with its continual *functioning* since that point of origin. How life began is *biogeny*; how it continues is *biology*. Basically, then, there are two kinds of science.

Origin Science	Operation Science
Past singularities	Present regularities
Beginning of universe	Running of universe
Forensic science	Empirical science

The Cause of Origin Versus the Laws of Operation

It is important to note that the laws by which something operates are not the same as the cause (s) by which it began. For example, the laws necessary for *running* a windmill are not sufficient to *produce* one; a windmill functions by the purely natural laws of physics (pressure, motion, inertia, etc.). However, these natural laws do not *create* windmills; they only *operate* by them. The reason for this is that natural laws deal with the *continuation* of things, but they are not sufficient to explain their *commencement*.

It is only because things operate in a regular way in the present that it is possible to make observations and predictions based on them; thus, both observation and repetition are necessary for natural (operational) science. The origin of past events, whether the universe or life, was not observed and it is not repeated; therefore, it does not fall under the domain of natural (operation) science. Since an origin event is by its very nature not repeated, it falls into a class of its own—it is an unobserved singularity, and it has not happened again. Hence, it must be approached in a different way than empirical (natural, observational) science is. Actually, as we have seen, origin science is more like a forensic science, which is where there was no observation of the event and it cannot be repeated. For instance, take the case of an unobserved death by an unknown cause. Since no one saw it, the principle of *observation* used in operation science cannot be invoked, and since the person is dead, it cannot be repeated. Likewise, the principle of *repetition* is not present—so neither of the two bases of operation science is present in origin science.

Lacking the principles of *empirical* science does not totally frustrate a scientific analysis of a death, for example—the principles of forensic science can be evoked. Using the evidence that remains (such as weapons, wounds, fingerprints, DNA, etc.), the forensic scientist can make a plausible reconstruction of the original event. In a similar way, the origin scientist attempts to reconstruct past unobserved singularities, such as the origin of the universe and the origin of life.

THE PRINCIPLES OF ORIGIN SCIENCE

Every discipline has its own principles. *Operation* science is based on *observation* and *repetition*: Without a recurring pattern of events against which to measure theories, there is no valid operational science. Since *origin* science lacks both the observation and repetition of origin events, it must depend on other principles. Besides the two obvious ones (*consistency* and *comprehensiveness*) that every theory or model should employ, the most crucial principles of

origin science are *causality* and *uniformity* (analogy).[1] This contrast can be diagrammed as follows:

Principles of Origin Science	Principles of Operation Science
Causality	Observation
Uniformity (analogy)	Repetition

The Principle of Causality

Like the forensic scientist, the origin scientist believes that *every event has an adequate cause*, which is true of unobserved events as well as observed ones. This principle has a venerable history in science and scarcely needs justification. It is sufficient to note that Aristotle (384–322 B.C.) held that "the wise man seeks causes," while Francis Bacon (1561–1626) believed that true knowledge is "knowledge by causes" (*NO*, 2.2.121), and even the skeptic David Hume (1711–1776) said, "I never asserted so absurd a Proposition as that anything might arise without a cause" (*LDH*, 1.187). It is self-evident to rational beings, uncorrupted by philosophical speculation, that *everything that comes to be has a cause*: Nothing does not produce something. If something came into existence, then something caused it. Indeed, without the principle of causality, there would be no science of operation *or* origins.

It is important to note that the principle of causality does not claim that *everything* has a cause. The principle of causality does not apply to everything but only to

- everything that *begins*;
- everything that is *finite*;
- everything that is *contingent*;
- everything that is *dependent*.

That is, every *event* needs a cause, but every *thing* does not. If there is some thing (being) that is eternal and independent (whether it is the universe or God), then it does not need a cause. Causality applies to things that *come to be*, not to what simply *is*. Whatever simply is, does not need a cause; it is uncaused. The question to be answered is whether the cosmos (space-time universe) came to be (as creationists hold) or whether it always was (as many noncreationists believe).

The Principle of Uniformity (Analogy)

There is another principle of origin science, known as the principle of uniformity (or analogy). Generally stated, it affirms that "the present is the key to the past." Applied more specifically to the question of past unobserved causes, the principle of uniformity (analogy) asserts that the

[1] Uniformity should not be confused with uniformitarianism, which makes the unjustifiable assumption that all events must have natural causes.

kind of cause that regularly produces a certain kind of event in the present is the kind of cause that produced a like effect in the past. Or, more briefly, *past events have causes similar to the causes of like present events*.

The principle of uniformity derives its name from the *uniform* experience on which it is based; that is, repeated observations reveal that certain kinds of causes regularly produce certain kinds of events. For example, water flowing over rocks has a rounding effect on them. Likewise, wind blowing on sand (or water) produces waves, and heavy rain on dirt results in erosion, and so on. All of these causes are natural (i.e., secondary) ones, meaning that their effects are produced by natural forces whose processes are an observable part of the ongoing *operation* of the physical universe.

There is another kind of cause, known as primary. Intelligence is a primary cause, and the principle of uniformity (based upon constant conjunction) informs us that certain kinds of effects come only from intelligent causes. Human language, pottery, portraits, and symphonies all have intelligent causes. So convinced are we by previous repeated experience that only intelligence produces these kinds of effects that when we see even a single event that resembles one of these kinds of effects, we invariably posit an intelligible cause for it.

For example, when we see "Buy Fords" written in the sky, we never assume it was placed there by a secondary cause (like wind and clouds). In a similar manner, when we see the faces of four presidents on Mount Rushmore, we always conclude that some intelligence caused them, and when we come across "John loves Mary" written on the beach, we never assume the waves did it. The reason we unhesitatingly posit intelligent causes for these kinds of things is that we have repeatedly observed that similar kinds of effects are produced by intelligent causes. Now, the question is whether the origin of the first living organism (which we did not observe) was by a secondary (natural) cause or by a primary (intelligent) cause. The only scientific way to determine this is by analogy with our experience of what kind of cause regularly produces that kind of effect in the present.

Another thing to observe about the principle of uniformity is that it is an argument from analogy: It is an attempt to get at the unknown (past) through the known (present). Since we do not have direct access to the past, we can "know" it only indirectly by analogies with the present. This is how human history is reconstructed, and it is the way earth history and life history are re-created as well. Historical geology is a case in point—it is totally dependent as a science on the principle of uniformity. Unless we can presently observe in nature or in the laboratory certain kinds of causes producing certain kinds of events, we cannot validly reconstruct geological history. However, since we can observe natural causes producing these kinds of effects today, we can postulate that similar natural causes produced similar effects in the geological record of the past.

The same point can be made for human history, where primary intelligent causes are involved. Archaeology as a science is possible only because we assume the principle of uniformity. Thus, when we find certain kinds of tools, art, or writing, we posit intelligent beings who produced them. Even finding simple arrowheads leads us to the conclusion that intelligent beings produced them, not natural forces like wind and water. When past remains contain writing, art, poetry, or music, we have no problem whatsoever in insisting on intelligent primary causes for them. So whether it is a secondary or primary cause that is called for, the principle of uniformity is the basis, for unless we have a constant conjunction of a certain kind of cause with

a certain kind of effect in the present, we have no grounds on which to apply this principle of analogy to past events known only from their remains.

The SETI (Search for Extra-Terrestrial Intelligence) program is also based on the principle of analogy. Carl Sagan (1934–1996) affirmed that "the receipt of a single message from space would show that it is possible to live through such technological adolescence" (*BB*, 275). The reason this can be done is that the letter sequences in a human language are recognizably different from that which results from natural laws. This has been established scientifically in the studies on information theory by Claude E. Shannon at the Bell Laboratories.

THE PRACTICE OF ORIGIN SCIENCE

Now that we have an understanding of the basic principles of origin science, let us apply them to the three main areas of origin: the beginning of the universe (cosmogony), the emergence of first life (biogeny), and the appearance of human (rational) beings (anthrogeny).

	ORIGIN SCIENCE	OPERATING SCIENCE
Universe	Cosmogony	Cosmology
Life	Biogeny	Biology
Humans	Anthrogeny	Anthropology

In each of the areas of origin—the cosmos, first life, and human beings—we will try to determine whether the scientific evidence favors positing the direct action of a primary cause or only a secondary cause for these events. The main two principles used to determine this will be the principle of causality and the principle of uniformity (analogy). The question is this: Was the cause of the origin event (by analogy to the present) a natural cause or an intelligent one?

The Origin of the Universe (Cosmogony)

The Christian doctrine of Creation states that there was a beginning of the universe (see chapters 2–3). The universe is not eternal; it came into existence out of nothing. The question here is whether there is any scientific evidence to support this belief.

Evidence From the Second Law of Thermodynamics

There are several lines of evidence that convince even agnostic scientists that the universe came into existence out of nothing. One of the most important is the second law of thermodynamics, which states that *the amount of usable energy in the universe is decreasing*. Nuclear fission is occurring in the stars, and, thus, the universe is running out of usable fuel to keep itself going—energy is being transformed into unusable heat. Another way to put it is that in the universe as a whole, things are generally moving from order to disorder, for *in a closed, isolated system, such as the physical universe is, things left to themselves tend to become more random and disordered*.

This disorder is not always true of smaller areas within the universe, because these smaller areas are open systems that receive energy from outside themselves. A living organism, for instance, receives outside energy (from the sun) that keeps it from going into disorder and using up its energy. Nevertheless, since the universe *as a whole* is a closed system, there is by definition no outside source of physical energy to help it overcome the degenerating effects of the second law.

The universe as a whole is running down, and if it is running down, it is not eternal. If the universe were infinite, it would not be running down, for something cannot run out of an infinite amount of energy. In short, whatever is petering out must have had a beginning, because it does not take forever to run out of a limited amount of energy. So the second law of thermodynamics points to a *beginning of the universe*.

Looking at this evidence, the agnostic astrophysicist Robert Jastrow concluded that "three lines of evidence—the motions of the galaxies, the laws of thermodynamics, and the life story of the stars—pointed to one conclusion; all indicated that the Universe had a beginning" (*GA*, 111). If so, then this is scientific support for the Christian doctrine of the creation of the universe, for it is a rational inference based on scientific evidence that the physical universe is not eternal. It came into being, and whatever comes to be needs a cause, so it is reasonable to posit a Creator of it.

Evidence From the Expanding Universe

Most contemporary astronomers believe that the universe is expanding; measurements indicate that stars are moving apart. Indeed, the analogy often given is that of dots and a balloon that is increasing in size so that the dots (stars) are getting farther away from one another. One of the most significant studies undertaken on this was by Allan Sandage. "He compiled information on 42 galaxies, ranging out in space as far as six billion light years from us." His measurements indicate "that the universe was expanding more rapidly in the past than it is today. This result lends further support to the belief that the universe exploded into being" (Jastrow, ibid., 95).

If these observations and inferences are correct, then they are further confirmation that the cosmos had a point of beginning, for if one reverses the "camera" of time, the universe gets smaller and smaller until it is invisible. Indeed, if it is carried back mathematically and logically, one reaches a point where there is no space, no time, and no matter: There is literally nothing.

So there was nothing, and then suddenly there was something out of nothing. Needless to say, if this was the case, as many scientists are now claiming, then it is scientific confirmation of the belief in Creation *ex nihilo*; even many nontheistic astronomers and scientists are speaking of "creation out of nothing." Some who want to avoid God are claiming that "the universe came into existence from nothing and by nothing" (see Kenny, *FW*, 147). This, however, is a denial of the principle of causality and is contrary to the very nature of science, which is to find an adequate cause for events. Even so, it does show that the evidence for the universe coming into existence out of nothing is so persuasive to them that they have had to stop positing an eternal, and therefore uncaused, universe. Thus, they have not been able to avoid a Creator.

Evidence From the Radiation Echo

A third line of evidence has convinced many scientists that the universe had a beginning. Two scientists, Arno Allan Penzias (b. 1933) and Robert Woodrow Wilson (b. 1936), were given a Nobel Prize for the discovery of the radiation fireball (see Jastrow, *GA*, 5). The entire universe is giving off a radiation glow, the exact wavelength of that produced by a gigantic explosion. Penzias and Wilson postulate that this could have been the "big bang" produced when the universe exploded on the scene some billions of astronomical years ago. Since the evidence for the expanding universe shows the universe expanded faster in the past, this fits with the concept of an explosion, which also produces greater velocities at first but later slow down and eventually peter out. And, the petering-out fits the data from the second law, which indicates the universe is running down.

Thus, these three lines of evidence converge to show that the cosmos had a *beginning*—exactly the point of the biblical teaching about creation. Indeed, Robert Jastrow declared, "Science has proven that the universe exploded into being at a certain moment." So he concluded, "The scientist's pursuit of the past ends in the moment of creation" (*GA*, 114–15). If the universe was created, then it is reasonable to posit a Creator for it.

In addition, Einstein's general theory of relativity and the large mass of energy discovered by the Hubble Space Telescope (a mass predicted by the big bang theory) confirm the view that the universe had a beginning.

Of course, this scientific evidence is not absolute proof that the physical universe had a beginning for at least two reasons.

First, scientific evidence by its nature does not yield full proof of things.

Second, other more satisfactory explanations may be found for the expanding universe and the radiation. Some have even suggested that the second law does not apply to the whole universe, but only to closed isolated systems within it. Most often, they suggest a rebound theory: The universe will bounce back from its expansion and start over again, and so on infinitely. Although this view lacks convincing evidence, it does show that one must temper dogmatism about scientific arguments. Perhaps it is simply sufficient to say that the prevailing view in the scientific community presents evidence that strongly supports what Christians have always believed on biblical (and some even on philosophical) grounds, namely, that the universe had a *beginning*.

Now, if the evidence supports the view that the cosmos came into existence out of nothing, then it is reasonable to posit a Cause for it. In addition, since the cosmos is the natural universe, then, by its very nature, as a Cause beyond the natural world, this first Cause would be a supernatural Cause. This is, of course, what Christian theists have always affirmed: "In the beginning God created the heavens and the earth" (Gen. 1:1).

Evidence From the Great Mass of Energy

It is widely accepted in the scientific community that when a theory can predict a result that is later acquired by observation, this counts as confirmation of that theory. This is precisely what happened when, in 1992, it was reported that the Hubble Space Telescope discovered a great mass of energy in outer space that was predicted from the big bang theory. After viewing the

evidence from the Hubble, one scientist, George Smoot, exclaimed, "If you are religious, it is like looking at God!" ("Science, God and Man" in *Time*, Dec. 28, 1992).

Evidence From General Relativity

In addition to these four lines of evidence, there is Einstein's general theory of relativity. According to this view, the universe must have had a beginning.

> De Sitter studied Einstein's equations, and discovered that they had an expanding-Universe solution. [Arthur Eddington] acclaimed it as "a revolution of thought," and set out to work to organize the eclipse expedition that proved the validity of Einstein's ideas in 1919. The expedition measured the bending of light by gravity—an effect predicted by relativity, (cited by Jastrow, *GA*, 36)

This dramatic verification of Einstein's theory confirmed that the universe had a beginning.

However, Einstein failed to draw this conclusion, introducing a "fudge factor" into his formula. After being challenged and recanting, he later called it the biggest error of his career (ibid., 25–27). Indeed, general relativity demands a beginning of the universe, thus providing a fifth line of scientific evidence for the Creator.

Conclusion From the Astronomical Evidence

In view of the strong scientific evidence, Robert Jastrow concluded, "That there are what I or anyone would call supernatural forces at work is now, I think, a scientifically proven fact" (ibid., 18). He further observed, "Astronomers now find that they have painted themselves into a corner because they have proven, by their own methods, that the world began abruptly in an act of creation.… And they have found that all this happened as a product of forces they cannot hope to discover" (ibid., 15). Thus, he notes that "the scientist's pursuit of the past ends in the moment of creation," and "this is an exceedingly strange development, unexpected by all but theologians. They have always accepted the word of the Bible: 'In the beginning God created the heaven and the earth' " ("SCBTF" in *CT*, 115).

The Origin of Life (Biogeny)[2]

The Bible declares, "God created … every living thing" (Gen. 1:21 NKJV). By contrast, the prevailing theory among scientists is that life began by spontaneous generation from nonliving chemicals. As a matter of fact, there are only two possible views: Either life originated by an Intelligent Creator, or else it resulted by purely natural processes from nonliving matter. Robert Jastrow said, "*Either* life was created on the earth by the will of a being outside the grasp of scientific understanding, *or* it evolved on our planet spontaneously, through chemical reactions occurring in nonliving matter lying on the surface of the planet" (*USD*, 62).

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[2] This section follows the excellent book by Charles Thaxton, et al., called *The Mystery of Life's Origin.*

NKJV New King James Version of the Bible

Which view of the origin of life is more scientifically plausible? Before answering this, we must remind ourselves that in origin science there is no direct way to measure our theory against the origin event (of the emergence of first life) by *observation*. No scientist observed the origin of first life, and it is not being repeated over and over again. Ever since Francesco Redi (1626–1697) and Louis Pasteur's (1822–1895) experiments, the theory of the spontaneous (unsupernatural) generation of life has been discredited. In spite of this, many scientists hold out hope that life in the past arose contrary to the evidence in the present. This, of course, is a violation of the principles of uniformity and causality, by which theories of origin are tested. Since the second principle simply says there must be an adequate cause, attention will be focused on the first principle, which deals with what kind of cause is adequate to explain the origin of life.

Distinguishing Different Kinds of Effects

The principle of uniformity (analogy) declares that the kinds of causes that produce certain kinds of effects in the present should be posited for these kinds of effects in the past. That being so, the question is: What kind of effect takes the direct action of an intelligent cause, and what kind takes only a natural cause? First, let's consider a series of illustrations that make the point intuitively. We know by observing constant conjunction in the present that natural causes can and do produce sand dunes, but that it takes intelligent causes to produce sand castles. Likewise, natural causes make crystals, but only intelligent causes create chandeliers. The following contrasts will further this distinction.

NATURAL CAUSES PRODUCE	**INTELLIGENT CAUSES PRODUCE**
sand dunes	sand castles
crystals	chandeliers
waterfalls	power plants
round stones	arrowheads
Mt. McKinley	Mt. Rushmore
clouds	skywriting
arrangement of letters in alphabet soup	arrangement of letters in an encyclopedia

When looking at these two lists, we know that natural causes alone never produce the kinds of effects in the right-hand column. Why? The answer is the principle of uniformity—our uniform experience, based on constant conjunction of intelligent causes with these kinds of effects, leads us to believe that other similar effects will also have an intelligent cause. This being the case, we need only ask: Is a living cell more like an encyclopedia or a bowl of alphabet soup?

The intelligent-design movement is based on this distinction. Both Phillip Johnson (see his *DT*) and William Dembski (see his *ID*) use it to demonstrate that irreducible complexity and specified complexity, such as found in living cells, are best explained by positing an Intelligent Designer.

Specified Complexity Distinguishes Life

Definitions of biological life are hard to come by; however, some distinguishing characteristics are clear. The famous biologist Leslie Orgel observed the important differences when he said, "Living organisms are distinguished by their specified complexity. Crystals … fail to qualify as living because they lack complexity; random mixtures of polymers fail to qualify because they lack specificity" (*OL*, 189). That is to say,

(1) Crystals are *specified* but not complex.
(2) Random polymers are *complex* but not specified.
(3) Life is both *specified* and *complex*.

In brief, life on the genetic level is characterized by *specified complexity*. What this means can be understood by the concept of boundary conditions. Michael Polanyi explains,

> When a saucepan bounds a soup that we are cooking, we are interested in the soup; and, likewise, when we observe a reaction in a test tube, we are studying the reaction, not the test tube. The reverse is true for a game of chess. The strategy of the player imposes boundaries on the several moves which follow the laws of chess, but our interest lies in the boundaries—that is, in the strategy, not in the several moves as exemplification of the laws. And similarly, when a sculptor shapes a stone or a painter composes a painting, our interest lies in the boundaries imposed on a material, and not in the material itself. ("LTPC" in *CEN*)

These boundary conditions

(1) transcend the laws of physics and chemistry;
(2) result in letter sequences that are mathematically identical to those in a human language; and
(3) resemble those made by an intelligent sculptor who imposes boundaries on stone.

So life is made up of a (four-letter) genetic alphabet that manifests the characteristics of intelligently imposed boundary conditions, such as a skywriter imposes on smoke, a potter on clay, or an author on letters. In fact, studies done by Hubert Yockey on the application of information theory (developed for human language) reveal that the pattern sequence in the genetic code and that in a human language are "mathematically identical." Yockey concludes, "The sequence hypothesis applies directly to the protein and the genetic text as well as to written language and therefore the treatment is mathematically identical" (*JTB*, 16).

Boundary Conditions

Now we have an answer on the genetic level to our question: Is life more like a bowl of alphabet soup or an encyclopedia? *It is exactly like an encyclopedia*. In fact, the genetic information in a single-celled animal, if spelled out in English, is equal to that of a thousand

volumes of the *Encyclopedia Britannica*. In spite of his confessed agnosticism, Carl Sagan provided powerful proof for an intelligent Creator of life when he argued that "a single message" (*BB*, 275) from outer space would prove to him that there is supernormal intelligence behind it. If one short message takes superhuman intelligence, then how much more would a whole volume of an encyclopedia? Famous contemporary American astronomer Allan Sandage said it well:

> The world is too complicated in all its parts and interconnections to be due to chance alone. I am convinced that the existence of life with all its order in each of its organisms is simply too well put together. Each part of a living thing depends on all its other parts to function. How does each part know? How is each part specified at conception? The more one learns of bio-chemistry the more unbelievable it becomes unless there is some type of organizing principle. ("SRRB" in *T*, 20)

Evidence of intelligence behind living things is not limited to the cosmic or microscopic genetic level: It can be observed with the naked eye. Renowned Harvard biologist Louis Aggasiz observed,

> [Darwin] has lost sight of the most striking of the features, and the one which pervades the whole, namely, that there runs throughout Nature unmistakable *evidence of thought*, corresponding to the mental operations of our own mind, and therefore intelligible to us as thinking beings, and unaccountable on any other basis than that they own their existence to the working of intelligence; and no theory that overlooks this element can be true to nature. (*AJS*, 1860)

Irreducible Complexity Is Evidence of Design

Discoveries in microbiology also confirm that life is designed. In Michael Behe's revolutionary book *Darwin's Black Box*, the argument for intelligent design of life is clearly set forth. Behe notes that Darwin admitted, "If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down" (from Darwin, *OOS*, sixth ed., 154). Evolutionist Richard Dawkins agrees:

> Evolution is very possibly not, in actual fact, always gradual. But it must be gradual when it is being used to explain the coming into existence of complicated, apparently designed objects, like eyes. For if it is not gradual in these cases, it ceases to have any explanatory power at all. Without gradualness in these cases, we are back to miracle, which is a synonym for the total absence of [naturalistic] explanation. (*ROE*, 83)

However, remarks Behe, this is precisely the case with what was a "black box" in Darwin's day, namely, the human cell. Now microbiologists have peered into the human cell and discovered an irreducibly complex organism that cannot be explained in incremental, step-by-step stages:

> No one at Harvard University, no one at the National Institutes of Health, no member of the National Academy of Sciences, no Nobel Prize winner—no one at all can give a detailed account of how the cilium, or vision, or blood clotting, or any complex biochemical process might have developed in a Darwinian fashion. But we are here. All these things got here somehow; if not in a Darwinian fashion, then how? (*DBB*, 187)

Behe concludes that "other examples of irreducible complexity abound, including aspects of DNA reduplication, electron transport, telomere synthesis, photosynthesis, transcription regulation, and more" (ibid., 160). Hence, "Life on earth at its most fundamental level, in its most critical components, is the product of intelligent activity" (ibid., 193). It follows, then, that "the conclusion of intelligent design flows naturally from the data itself—not from sacred books or sectarian beliefs. Inferring that biochemical systems were designed by an intelligent agent is a humdrum process that requires no new principles of logic or science" (ibid.). So

> the result of these cumulative efforts to investigate the cell—to investigate life at the molecular level—is a loud, clear, piercing cry of "design!" The result is so unambiguous and so significant that it must be ranked as one of the greatest achievements in the history of science. The discovery rivals those of Newton and Einstein, (ibid., 232–33)

Even before Behe, it was observed that nature manifests amazing designs that are like things known to have intelligent causes. The human eye is an incredible camera that human inventors have not yet rivaled. A bird's wing is amazingly adapted to flight and would have to be completely and wholly intact before flight was possible. Furthermore, nature's anticipatory design bespeaks of intelligent forethought. Bodily glands anticipate danger and secrete appropriate chemicals into the blood to enable one to react. Many animals lay their eggs, in advance, where food and survival are possible for their offspring. All of this resembles an advance plan of some Mind beyond creatures that has preprogrammed their "instincts" for the ongoing of life. Even the casual observer cannot avoid seeing the similarities between the kinds of effects known to be produced by intelligent causes and those present in living things.

Of course, some have suggested that this could have happened by purely natural processes apart from an intelligent intervention; natural selection is often suggested as one such mechanism that makes this possible. However, this response will not suffice when speaking of the origin of *first* life, for there was no natural selection on the prebiotic level. Natural selection is a process that operates only *after* life has begun. Evolutionist Theodore Dobzhansky declared, "Prebiotic natural selection is a contradiction in terms" (*OPSTMM*, 311).

Some naturalists have speculated that the first living organism could have been more simple than one-celled organisms alive today. Nevertheless, this response is insufficient to negate the argument for an intelligent Cause of first life for at least two reasons.

First, it is purely speculative, without any basis in fact.

Second, even if first life were more simple, it would still have specified complexity, which is known to require an intelligent Cause. For example, even if the first living thing did not have as much information as an encyclopedia, but only as much as one essay in it, it would still need an intelligent Cause. Only intelligent beings write articles, or even paragraphs. If an agnostic like Carl Sagan would accept a "single message" as proof of intelligence, then why not the highly complex message known to be in a living cell?

The Anthropic Principle

Another bit of evidence for an intelligent Creator of life is the anthropic principle. According to it, the universe from its very inception was amazingly fine-tuned for the emergence of human life. From the beginning of the cosmos, to the formation of the earth, to the emergence of living

things, all conditions were incredibly adapted to the eventual appearance of human life. Again, commenting on this phenomena, one agnostic scientist confessed,

> The anthropic principle is the most interesting development next to the proof of the creation, and it is even *more* interesting because it seems to say that science itself has proven, as a hard fact, that this universe was made, was designed, for man to live in. It's a very theistic result. (Jastrow, "SCBTF" in *CT*, 17)

Highly regarded physicist and astronomer Stephen Hawking described how the value of many fundamental numbers in nature's laws "seem to have been very finely adjusted to make possible the development of life" and how God appears to have "very carefully chosen the initial configuration of the universe" (cited by Heeren, *SMG*, 67). Albert Einstein said, "The harmony of natural law … reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection" (*IO*, 40).

Examples of the fine-tuning of the universe are listed by Hugh Ross (see *FG*, 119–38). A select sample includes the following:

(1) The 21 percent oxygen in the atmosphere is just right. At 25 percent, spontaneous fires would break out, and at 15 percent, humans would suffocate.
(2) If the gravitational force were altered by only 1 part in 10 to the fortieth, the sun would not exist, and the moon would crash into the earth.
(3) If the centrifugal force of planetary movement did not precisely balance the gravitational forces, nothing could be held in orbit around the sun.
(4) If the universe were expanding at a rate of one-millionth more slowly, the temperature on earth would be 10,000°.
(5) If the average distance between stars (of thirty trillion miles) were altered only slightly, there would be extreme temperature variations on earth.
(6) Even a slight variation in the speed of light would alter the other constants and make life on earth impossible.
(7) If Jupiter were not in its current orbit, we would be bombarded by space material.
(8) If the thickness of the earth's crust were altered, volcanic and tectonic activity would make life impossible.
(9) If the rotation of the earth took longer than twenty-four hours, temperature variations would be too great between night and day. If it were shorter, atmospheric wind velocities would be too great.
(10) If the axial tilt of the earth were altered slightly, surface temperatures would be too great for life on earth.
(11) If the lightning rate were greater, there would be too much fire and destruction. If less, there would be too little nitrogen (fertilizer) in the soil.
(12) If there were more seismic activity, much life would be lost. If less, nutrients on the ocean floor would not be recycled to the continents through tectonic uplift, etc.

In short, without intelligent advanced planning of all the factors in the universe, human life would never have emerged, nor would it be sustained.

Nobel Prize-winning atheist/agnostic Steven Weinberg even went so far as to say,

> It seems to me that if the word "God" is to be of any use, it should be taken to mean *an interested God, a creator and lawgiver who established not only the laws of nature* and the universe but also standards of good and evil, some personality that is concerned with our actions, something in short that is appropriate for us to worship. (*DFT*, 244, emphasis added)

The Origin of Human Beings (Anthrogeny)

The third area of origin is that of human beings, which, since the time of Darwin, has been hotly debated. Macroevolutionists, on the one hand, claim a common ancestry of all living things; creationists, on the other hand, insist on separate ancestry of all basic forms of life, including human life. The former views all living things as a tree, and the latter like a forest. The question, then, is: What does the scientific evidence indicate—is there evidence of a distinct origin of human life separate and above the level of animals?

Rational Evidence

One fundamental law of thought denied by macroevolution is that "an effect cannot be greater than its cause." In popular language, "water does not rise any higher than its source." Philosophically put, the effect cannot have any more than what the cause placed in it.

However, according to naturalistic evolution, not only did nothing produce something, and the nonliving produced the living, but with regard to human beings, the nonrational produced the rational. We know, though, that the rational does not emerge from the nonrational any more than being is caused by nonbeing.

Linguistic Evidence

Human language is another distinctive evidence of human creation by a rational Creator. Human language is unique—no animals speak it or can learn it. There are several things particular to language; Clifford Wilson and Donald McKeon list twelve of them in their excellent book *The Language Gap*:

(1) Discreteness of sound/form;
(2) Symbolic nature of the units;
(3) Rule-governed system;
(4) Compositional;
(5) Complex;
(6) Displacing;
(7) Unbounded in scope (open-ended);
(8) Independent of stimulus control;
(9) Suitable for contextualized communication;
(10) Independent of need satisfaction;
(11) Spontaneously acquired; and
(12) Culturally transmitted. (*LG*, 147–53)

Look at the words of a scientist who unsuccessfully attempted to teach a chimpanzee how to speak a human language:

> Despite the frustrations of Project Nim, I knew that there could be no substitute for that intelligent bundle of playfulness and mischief, a creature more human than any other nonhuman I knew. One of the reasons this parting was so painful was that *there was no way to talk with him about it*. Nim and I were able to sign about simple events in his world and mine. But how could I explain why I and the other project members who came along to Oklahoma suddenly abandoned him? How could we explain that it was necessary to leave him forever in a totally new environment, with a totally new group of human and nonhuman primates? (ibid., 153)

Another scientist, who once believed chimps could learn to speak our language, eventually discarded his belief in the face of the experimental evidence:

> Chimps do not have any significant degree of human language and when, in two to five years, this fact becomes properly disseminated, it will be of interest to ask, Why were we so easily duped by the claim that they do? (ibid., 154)

Anthropological Evidence

Despite highly touted "missing links" between primates and humans, no undisputed examples have ever been produced (Gish, *EFSN*, chapter 6). Some instances have turned out to be frauds, like Piltdown Man. The evidence for Nebraska Man was later discovered to be nothing but an extinct pig's tooth! Neanderthal Man was as upright and human as we are; his bent-over posture was found to be the result of arthritis. The Peking-Man evidence has mysteriously disappeared, but since he died from sharp blows on the head, it is clear that he was not the ancestor of tool-making primates. Australopithecus is believed by many scientists to be an orangutan. So far as the actual, indisputable evidence goes, there is a big difference between human beings, who can produce pottery, culture, and religious practices, for instance, and primates, which can do none of these.

Further, similarity in structure between humans and primates is not a proof of common ancestry; it may very well be an indication of common design. Just as human designers utilize many of the same basic patterns over and over in their various creations, it is not unusual that the Creator of the universe has made many similar structures. Consider the similarity of the following utensils in one's kitchen. Does their similarity prove that the canning kettle evolved from a teaspoon?

Genetic Evidence

Human genes are unique. Humans do not interbreed with animals; they reproduce only their kind. Although humans share a high percent of chromosome similarity with some primates, this similarity is no more a proof of common ancestry than this year's Chevrolet is proof that it evolved naturally from last year's model without some intelligent creation of a new one. Actually, the so-called "evolution" of the car is not really an evolution at all; rather, it is a better model for

successive creation. Each new creation is the result of the direct intelligent intervention of the Creator, not of common ancestry by natural processes.

The truth is that there is a huge discontinuity between human beings and their animal predecessors. Human life appeared abruptly and completely—characteristics of which are indications of direct intervention of a Creator. Purely natural causes are continuous and gradual, and they do not produce the rational from the nonrational. This gap is spanned only by an intelligent Creator.

A powerful argument for the creation of human beings comes from the genetic information in the human brain. Carl Sagan, who, as cited before, believed a "single message" from space would prove a highly intelligent cause, observed,

> The information content of the human brain expressed in bits is probably comparable to the total number of connections among the neurons—about a hundred trillion, 10^{14} bits. If written out in English, for instance, that information would fill some twenty million volumes, as many as in the world's largest libraries—the equivalent of twenty million books is inside the heads of every one of us. The brain is a very big place in a very small space.... *The neurochemistry of the brain is astonishingly busy, the circuitry of a machine more wonderful than any devised by humans*. (*C*, 278, emphasis added)

If a single message from space takes an intelligent Creator, how about twenty million volumes full of information? If ordinary machines need an intelligent cause, then how about one that is more wonderful than any devised by humans?

Of course, again, noncreationists often point to natural selection as a means by which simple information (life) can evolve into more complex information (life forms). This, however, is a highly dubious alternative to the intervention of an intelligent Creator for at least two reasons.

First, natural selection does not really produce new (higher) forms of life; it simply preserves old ones. Natural selection is a survival principle—the survival of the fittest. It does not create new forms, but only helps preserve old ones (Geisler and Anderson, *OS*, 149). It is a survival—not an arrival—principle.

Second, the comparison between artificial selection, on which macro-evolution is based, and natural selection is erroneous. It is argued by evolutionists that if artificial selection can produce significant changes in a short time, then natural selection can produce even greater changes over long periods of time. This assumes that there is a significant similarity between artificial selection and natural selection; on the contrary, there is a significant difference between them at every major point (Matthews, "Introduction" to Darwin's *OOS*, xi). For example, artificial selection (AS) has an aim in view, but natural selection (NS) does not. Further, AS is an intelligently guided process, but NS is not. Also, in AS there are intelligent choices of breeds, which are then protected

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AS Artificial selection

NS Natural selection

AS Artificial selection

from destructive processes, whereas neither is true of NS. In addition, AS preserves desired freaks, while NS eliminates almost all freaks. Finally, AS continually interrupts the process to reach its goal, but NS does not. Thus, AS has preferential survival, as opposed to NS. So rather than being similar, artificial selection and natural selection are in the most crucial aspects exactly opposite. In chart form:

THE CRUCIAL DIFFERENCES

	Artificial selection	**Natural selection**
Goal	Aim (end) in view	No aim (end) in view
Process	Intelligently guided process	Blind process
Choices	Intelligent choice of breeds	No intelligent choice of breeds
Protection	Breeds guarded from destructive processes	Breeds not guarded from destructive processes
Freaks	Preserves desired freaks	Eliminates most freaks
Interruptions	Continued interruptions to reach desired goal	No continued interruptions to reach any goal
Survival	Preferential survival	Nonpreferential survival

Natural selection and artificial selection are radically disparate. Consequently, the comparison fails, and, with it, the crucial mechanism for Darwinian evolution. Natural selection fails because, as a purely natural process, it lacks intelligence to do what can be done by artificial (i.e., intelligent) selection. The only way natural selection can be made to work is to endow it with intelligent powers, which evolutionists often do.

NS Natural selection

AS Artificial selection

NS Natural selection

AS Artificial selection

NS Natural selection

AS Artificial selection

NS Natural selection

For example, evolutionists frequently say things like the following about natural selection: It "designed" our survival (Sagan, *BB*, 11). It "arranged" for the continuance of life (Sagan, *C*, xiii). To claim that natural selection can "design" or "arrange" is to say that it has the power of intelligence. In fact, evolutionists endow natural selection not only with the powers of intelligence but also with the power of godhood; Charles Darwin himself referred to it as "my deity Natural Selection" (*LL*, Oct. 20, 1859). The co-inventor of natural selection with Charles Darwin, Alfred Wallace (1823–1913) said that natural selection is "a Mind not only adequate to direct and regulate all the forces at work in living organisms, but also the more fundamental forces of the whole material universe" (*WL* [1910] as cited in Edwards, ed., *EP*, 8.276).

In brief, in order to avoid the intelligent Creator of human life, naturalistic evolution postulates natural selection as a "supreme" intelligent "deity" that "guides" the process of evolution toward its eventual "goal" of producing life. In fact, by attempting to avoid an intelligent Cause, they substitute one of their own.

Geological Evidence

It is frequently forgotten that the only real evidence for or against evolution is in the fossil record of the past. Every other argument for evolution is only *what could have been*; only the fossil record contains *what actually did happen*. Darwin recognized this as a problem as well, and he wrote in *On the Origin of Species*,

> Why then is not every geological formation and every stratum full of such intermediate links? Geology assuredly does not reveal any such finely graduated organic chain, and this, perhaps, is the most obvious and gravest objection which can be urged against my theory. (280)

In the almost one hundred fifty years since Darwin wrote, the situation has only become worse for his theory. Noted Harvard paleontologist Stephen Jay Gould (1941–2002) has written,

> The extreme rarity of transitional forms in the fossil record persists as the trade secret of paleontology. The evolutionary trees that adorn our textbooks have data only at the tips and nodes of their branches; the rest is inference, however reasonable, not the evidence of fossils. (*"EEP,"* 14 in *NH*)

Niles Eldredge and Ian Tattersall agree, saying,

> Expectation colored perception to such an extent that the *most obvious single fact about biological evolution*, "non-change," has seldom, if ever, been incorporated into anyone's scientific notions of how life actually evolves. If ever there was a myth, it is that evolution is a process of constant change. (*MHE*, 8)

What does the fossil record suggest? Evolutionists like Stephen Jay Gould came to agree with what creationists from Louis Agassiz to Duane Gish have said all along, namely,

> The history of most fossil species includes two features particularly inconsistent with gradualism:
>
> (1) *Stasis*. Most species exhibit no directional change during their tenure on earth. They appear in the fossil record looking much the same as when they disappear; morphological change is usually limited and directionless. (2) *Sudden appearance*. In any local area, a species does not arise gradually

by the steady transformation of its ancestors: it appears all at once and "fully formed" (Gould, "EEP" in *NH*, 13–14).

The fossil evidence clearly gives a picture of mature, fully functional creatures suddenly appearing and staying very much the same. There is no real indication that one form of life transforms into a completely different form. Some evolutionists, like Gould, have attempted to deal with the fossil evidence by introducing the idea of punctuated equilibrium. These scientists say that the jumps in the fossil record reflect real catastrophes that brought on major changes in the existing species. Therefore, in this view, evolution is not gradual, but rather punctuated by sudden leaps from one stage to the next. The theory has been criticized because its adherents cannot produce any evidence for a mechanism of secondary causes that makes these sudden advances possible. Their viewpoint, then, appears to be based solely on the absence of transitional fossils. However, Darwin understood such suddenness to be evidence of creation. Therefore, punctuated equilibrium is not an explanation but a description—a description of the evidence, which is best explained by Creation, not evolution.

SUMMARY

Christians believe in the Creation of the universe, of life, and of human beings. Science (as ordinarily conceived) does not deal with the *origin* of things but simply with their *operation*. Nevertheless, even though the study of origins cannot be done in an empirical way, it can be approached as a forensic science; that is, scientists can attempt to reconstruct the past on the basis of similarities in the present. This is done by way of the principles of causality and uniformity (analogy). When the principle of causality is applied to the scientific evidence that the universe had a beginning, it is concluded that there was a cause of the universe's coming into existence.

Further, when by analogy with the present it is asked what kind of cause best explains the vast amount of intelligent information (specified complexity) in even a single-celled animal, the answer is: an intelligent Cause. Similarly, when we analyze the great gap between animals and human beings, whose brains contain some twenty million volumes of genetic information, it is reasonable to postulate an intelligent Cause for the first human.

Thus, in many crucial ways, the present scientific evidence supports the reality of Creation as presented in the Bible. Since science is limited and progressive, we should not expect complete agreement in every detail with the biblical presentation. However, the amount of present agreement is striking, and it strongly supports the biblical teaching that God created the universe (Gen. 1:1), every living thing (1:21), and human beings (in His image—1:27).

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