

WHY I AM A CHRISTIAN

LEADING
THINKERS
EXPLAIN
WHY THEY
BELIEVE

NORMAN L. GEISLER
AND PAUL K. HOFFMAN,
EDITORS

WHY I BELIEVE THE BIBLE IS SCIENTIFICALLY RELIABLE

WALTER BRADLEY

During my thirty-five years of teaching at universities, I have had many opportunities to talk to skeptical students and colleagues about Christianity. Often these discussions have been in the context of a lunchtime or evening discussion for the purpose of exploring the bigger questions about life. I have found that scientists and engineers can much more easily accept the existence of God than they can biblical Christianity. Why is this so, and should it be the case?

The scientific discoveries of the past fifty years have dramatically changed the view of many scientists concerning the existence of God. Science historian Frederick Burnham recently commented that for scientists belief in God is more “respectable” today than at any time in the past hundred years.¹ Michael Shermer, editor of *Skeptics Magazine*, indicates that he believes the natural world provides the best evidence for belief in God. In his recent book, *How We Believe: Search for God in an Age of Science*,² Shermer uses empirical

results from a survey of twenty thousand people to demonstrate that, of those people who base their belief in God more on reason than on experience, the majority cite the evidence for a carefully crafted universe as their first reason. Over the past fifteen years, I have seen a dramatic increase in the acceptance of the design argument as I have had the opportunity to give a talk entitled "Is There Scientific Evidence for an Intelligent Creator of the Universe?" to over thirty thousand students on over sixty major university campuses around the country. In the past ten years, *Time* and *Newsweek* magazines have run major stories summarizing the scientific evidence that seems to point to a Creator God.

Ironically, while scientific discoveries have strengthened belief in a Creator, the confidence that the public has in the Bible has been systematically eroded by highly publicized "conflicts" between science and the Bible during the past 150 years, beginning with the seminal work of Charles Darwin. The 1927 Scopes "Monkey Trial" was a huge milestone in this controversy, with the biblical position argued by William Jennings Bryan being effectively ridiculed by Clarence Darrow. The popular movie *Inherit the Wind* based on the book by the same name reminded the next generation of this controversy, unfairly portraying Bryan as an ignorant bigot. Edward J. Larson documents the historical distortions in the movie *Inherit the Wind* in his Pulitzer Prize-winning book, *The Summer of the Gods: The Scopes Trial and America's Continuing Debate over Science and Religion*.³

Not all the heat for the Bible-science controversy came from advances in science, however. Higher criticism of the Bible and the rejection by liberal theologians in the nineteenth and twentieth centuries of supernatural events portrayed in the Bible created internal pressure within the church to deny the validity of any statement in the Bible that implied supernatural activity. For example, German theologian Franz Delitzsch at the beginning of the twentieth century wrote, "All attempts to harmonize our biblical story of the creation of the world with the results of natural science have been useless and must always be so."⁴

Any evaluation of the supernatural events of the New Testament must necessarily be philosophical and historical, as these unique events would have left no imprint in natural history for science to investigate. On the other hand, the events of the creation and early history of humankind recorded in Genesis 1–11 make claims that most certainly should be evident in natural history. It is these controversial claims that form the core of the Bible-science controversy.

The supposed contradictions between the Bible and science have been popularized by well-known television personalities and writers such as Steve Allen and Isaac Asimov. In his popular critique of the Bible, Steve Allen argues that the worldwide flood described in the Bible is impossible to reconcile with geological history.⁵ Asimov, who is an accomplished science popularizer and science fiction writer, has written a best-selling commentary on the Bible.⁶ He interprets Genesis 1 as saying that the sun, the stars, and the moon were created after light, after the water cycle, and after plants.⁷ His interpretation of Genesis 2 places the creation of plants and animals between the creation of Adam and the creation of Eve. This then provides the basis for his labeling Genesis 1 and 2 "folktales."⁸

The approach of the National Academy of Sciences of the United States has been to make religion and science mutually exclusive domains of knowing with its statement, "Religion and science are separate and mutually exclusive realms of human thought whose presentation in the same context leads to misunderstanding of both scientific theory and religious belief."⁹ This sounds like a restatement of the often quoted comment by Galileo Galilei that the intention of the Bible is to teach us how to go to heaven, not how the heavens go.¹⁰ However, Francis Schaeffer has warned against developing such an "upper story/lower story" mind-set wherein religious and spiritual truth is placed safely in the upper story where it cannot be tested and validated as other truth claims about matters of fact.¹¹ While this puts religious truth claims safely beyond disproof, it leaves one with no evidential basis for belief, making belief in the Christian truth claims an exercise in "blind" faith.

To be fair, I must acknowledge that the challenges to the scientific reliability of Genesis 1–11 are partly intrinsic to the text itself. Was the earth really created in six days some six thousand years ago? Has the earth had a flood since the beginning of the human race that covered the tallest mountain peaks? Is man as recent a development in natural history as the Bible suggests? Did early men live to be more than nine hundred years old? It is to these questions that we must now turn our attention to see what the Bible seems to say about these matters and what science seems to suggest at this point in our progressive understanding of natural history. My goal is to demonstrate that these two sources of information about creation and the early history of the human race can be harmonized to a much greater degree than most people, and especially most scientists, generally think they can. The fact that we cannot at present answer precisely all the questions raised by Genesis 1–11 is no doubt due to our limited understanding of the natural world and almost certainly to our misinterpretations of some of the Genesis 1–11 passages.

I will first consider various approaches to the interpretation of Genesis 1–11 to try to determine the breadth of interpretations that are permissible. Then I will consider what we know from science about these same subjects to see whether the scientific view of natural history can be harmonized with the biblical picture. In particular, I want to address the age of the universe, the process whereby the tremendous variety of flora and fauna came into existence, the origin of the human race and the life span of the earliest human beings, and the Genesis flood.

GENERAL ISSUES IN UNDERSTANDING GOD'S ROLE IN CREATION AS PRESENTED IN GENESIS 1–11

In this section, I will consider various issues related to the interpretation of Genesis 1–11. In particular, the relationship of God to nature as presented in the Bible must be defined as a backdrop for interpreting God's creative work in

Genesis. The use of “phenomenal” language will be discussed, as unnecessary conflicts between the Genesis account and scientific understanding result when this principle is not applied during interpretation. Finally, I will describe the three most common interpretative frameworks applied to a study of Genesis 1–11, and I will indicate the one to be utilized in this chapter.

RELATIONSHIP OF GOD TO NATURE

It is important to note that Christians are theists, not deists, which means they see God as being immediately responsible for the regular patterns we see in nature (usually called the laws of nature, or “natural” processes) as well as the irregular events we see in nature (often called signs or miracles). Thus, the only issue for a Bible-believing Christian is how God did his creative work, not whether he did it. The Bible teaches that God’s creation is purposeful (as distinct from accidental and purposeless), and that he not only created the physical universe but is also immediately responsible moment by moment for this physical reality in which we exist. Isaac Newton for one understood this and claimed that while the attraction of celestial bodies to each other was described by Newton’s law of gravity, the ultimate (versus proximate) cause for gravity was God’s providential care for his creatures.¹²

Many of the early practitioners of modern science shared the worldview that God was immediately responsible for nature.¹³ It was this belief that caused them to disregard the scientific tradition of the Greeks, in which experimentation was shunned, and begin to test their theoretical ideas with experiments, which opened the door to the rapid advance of modern science.

THE USE OF PHENOMENAL LANGUAGE IN GENESIS 1–11

One of the most common mistakes when reading Genesis 1–11 is a failure to recognize the legitimacy and appropriateness of “phenomenal language.”¹⁴ By phenomenal language, I mean wording that represents things as they appear to a casual human observer on the face of the earth. Biblical critics often interpret such phrases as “the four corners of the earth” or “from the rising of the sun to the going down thereof” as implying that the Bible teaches there is a flat, rectangular earth and rejects a heliocentric (sun-centered) theory of the solar system. Such criticisms are usually framed in complete disregard for contextual factors and distinctive characteristics of literary genres such as poetry. Matters of common sense and contemporary practice at the time a book of the Bible was written are largely ignored, resulting in amazingly naive and oversimplified interpretations of the text. Several examples will help to illustrate this point.

We use the terms *sunrise* and *sunset* each day in the weather portion of the newspaper and television news. It would be utterly absurd for some future generation of scientific savants to conclude that we were a terracentric, backward, primitive culture. A second more important example is the interpretation of Genesis 1:14–19, which describes “day” four of creation. Biblical critics such

as Isaac Asimov, to make the Genesis account look ridiculous, purposely claim that the Bible teaches that the sun, the moon, and the stars were created after the creation of light and after the creation of plants. There are at least four reasons to reject this interpretation of Genesis 1:16.

First, day and night were created during the first “day” (see Gen. 1:3–5), and the wording in Genesis 1:14 and 1:18 parallels that in Genesis 1:3–5, reaffirming God’s initial creation of these celestial bodies. Second, the Hebrew word *asa*, translated “made” in Genesis 1:16, appears in the appropriate form for completed action. Genesis 1:17–18 indicates that Genesis 1:16 is simply reconfirming God’s creation of these bodies, as previously noted in Genesis 1:3–5. Third, there is no reference to light anywhere in the Bible except in conjunction with the sun, the stars, the moon, or combustion.¹⁵ Thus, the creation of light on the first “day” must be the consequence of the creation of the sun and other stars. Fourth, one must ask how the earth could possibly maintain an orbit in the absence of the sun.

What are the innovative features that appear in “day” four that were not already mentioned in “day” one? They are the first appearance of the seasons and the first opportunity to be able to use the celestial bodies to make a calendar. Clearly, “day” four is the period in natural history during which the earth’s atmosphere was transformed from translucent (light-diffusing) to transparent (light-transmitting). It is generally accepted that the earth’s early atmosphere was rich in carbon dioxide, which would have created a greenhouse effect. This greenhouse effect of “days” one through three would have provided a more uniform climate over the entire earth (which is consistent with fossil evidence of lush vegetation covering the entire earth in the past), and would have muted seasonal variations in weather. This greenhouse effect was probably the consequence of a high concentration of carbon dioxide. The creation of plant life in “day” three would result in the gradual conversion of the atmosphere from one that was carbon dioxide rich to one that is oxygen rich, since plants consume carbon dioxide and give off oxygen. Beginning with a carbon-dioxide-rich atmosphere would benefit the development of flora, while the transformation to an oxygen-rich atmosphere would help to stimulate the development of more complex animal life. It is clear that the Bible teaches that God created the sun, the moon, and the stars in “day” one but made them appear for the first time to observers on the earth in “day” four. This is an excellent example of the Bible’s use of phenomenal language, describing natural phenomena as they would appear to a casual observer on the earth rather than describing them in a scientifically exact way.

THREE INTERPRETATIVE FRAMEWORKS FOR GENESIS 1–11

There are essentially three interpretative frameworks that various Christian groups have used to expound the meaning of Genesis 1–11, and they differ in their view of the way God accomplished his creative work, as described

in Genesis 1: (1) all fiat miracles, (2) all “natural” processes, and (3) fiat miracles plus “natural” processes.¹⁶

Young earth creationism. Some Christians believe that God worked entirely through fiat miracles to complete his creative work in six solar days. Proponents of this view sometimes suggest a long period of time between Genesis 1:1 and Genesis 1:2, the so-called gap theory. Alternatively, some young earth creationists assume that the earth is recent in origin but appears to be old. Both approaches attempt an accord with the scientific indications of an old earth and universe. However, most young earth creationists believe that the appearance of age can be accounted for entirely by the Noachian flood. Attempts to harmonize the biblical creation story with modern science are seen as fruitless, since science deals with natural processes and creation was accomplished entirely by fiat miracles.

Progressive creationism. Progressive creationists believe that God used a combination of miracles plus processes to create the universe, earth, and plant and animal life. They believe that Genesis 1–11 presents real space-time natural history and that the “days” of Genesis are something other than solar days. For example, some progressive creationists believe the “days” of Genesis 1 are epochs or eras of time during which development occurred by natural processes between times of specific fiat creation. Other progressive creationists believe that the “days” of Genesis 1 might be revelatory days, with the arrangement being more topical than chronological. The major types of plant and animal life, especially the human being, are considered to be special creations of God in both the young earth creationist and progressive creationist views. Progressive creationists believe that an essential harmony between Genesis 1–11 and modern scientific understanding is possible and to be expected, God being the author of both.

Theistic evolution. According to this view, God works entirely through process. The miracle of creation is implicit in the intrinsic design (laws of nature, universal constants, and so on) and initial conditions that allowed creation to unfold seamlessly through “natural” processes. This essential nonliteral view of the Genesis 1–11 account assumes divine authorship but would argue that the purpose of Genesis 1–11 is something other than to inform us about twentieth-century scientific theories. Scientific descriptions of origins are seen as complementary to theological descriptions of origins. The biblical record is thought to be a divinely inspired story or parable that attributes creation to God and provides a basis for understanding the enmity between humankind and God. Proponents of this view accept the development of all plant and animal life, including human beings, through “natural” processes. More recently, some advocates of this position have suggested that “fully gifted creation” is a better description of the position than “theistic evolution,” which carries baggage they do not accept. Like young earth creationists, advocates of a fully gifted creation have no problem harmonizing the biblical account with science, since the biblical account is not taken literally.

At the beginning of this section, I said that the three interpretative frameworks could be distinguished by how they explain God’s work in creation: by

fiat miracles, by fiat miracles plus “natural” processes (also attributed to God), or entirely by “natural” processes (again attributed to God). A second way to distinguish these three positions is based on interpretations of Genesis 1–11: entirely literally, essentially literally, and essentially nonliterally.¹⁷ Gleason Archer has some keen insights into the question of biblical literalism that bear mentioning:

The examples cited above lead us to the guiding principle that applies to the valid interpretation of any literary production, whether secular or sacred: the concern of the interpreter is to discover as accurately as possible what the original author meant by the words that he used, rather than imposing on his text meanings attached to terms used for translation purposes in some foreign language. Even earlier English works, such as those of Chaucer or Shakespeare, may be improperly construed by twentieth-century speakers of English who have not taken the trouble to discover what men of the fourteenth or seventeenth century meant or connoted by the words used differently than from what they signify today. A careful study of parallel usage elsewhere in Scripture is absolutely vital for valid interpretation of any biblical text. It should also be perfectly evident that it is wrong to take figuratively what the original author meant literally, or to take literally what the author intended in a figurative way. It is, therefore, ill-advised for any evangelical Bible teacher to urge the necessity of “taking the Bible literally.” Anyone who takes literally what God means figuratively is right on the brink of heresy!¹⁸

In trying to harmonize the details of the Genesis account of creation and the early history of the human race, I will utilize the progressive creationist framework, since it is the only one that seeks to harmonize what we can know from both science and theology. I also believe it is the correct framework. In the next section, I will explore what the Bible seems to say about earth and early human history and then evaluate whether the biblical scenario is contradicted by scientific observations.

CAN ONE HARMONIZE THE BIBLICAL ACCOUNT OF EARTH AND EARLY HUMAN HISTORY WITH SCIENTIFIC OBSERVATIONS?

In this section, I will consider the four key events described in Genesis 1–11 that touch areas that modern science has also studied: the age of the earth, the development of flora and fauna, the early history of the human race, including the alleged longevity of human beings in Genesis 1–11, and the Noachian flood.

THE AGE OF THE EARTH

The age of the earth is the poster child for the conflict between the Bible and science. The most derisive comments about biblical creationism are usu-

ally directed at the six-day creation that is alleged to have occurred six thousand years ago. Science has provided overwhelming evidence of a universe, solar system, and planets that are all between four and fifteen billion years old. Big bang cosmology and our expanding universe allow one to estimate the moment of the birth of the universe as approximately ten to fifteen billion years ago.¹⁹ Radiometric dating of the earth, moon, and meteorites gives clear and consistent evidence that the earth is 4.5 to 4.7 billion years old, using the relative concentrations of several different parent/daughter pairs of elements.²⁰ Coral reefs around the world,²¹ seafloor spreading,²² and the rate of sedimentation in the Gulf of Mexico²³ give more than ample additional, independent evidence of an ancient earth, one that must be much greater than six thousand years old. The most popular arguments proposed to justify belief in a young earth have been found to be wanting.²⁴ These include the decaying earth's magnetic field, the missing mass in the universe, the quantity of dust on the moon, the rate of accumulation of various elements in the ocean, and the cooling rate of the earth. In view of the overwhelming evidence for an old universe and earth, it is understandable that scientists would ridicule the biblical teaching of a six-day recent creation story. But does the Bible really require such a belief? Does the Bible necessarily teach young earth creationism?

English Bibles translate the Hebrew word *Yom* as "day." It is worth noting that the Hebrew language has many fewer words than English, and thus has greater ambiguity. The term *Yom* is used in the Bible not only to refer to a twenty-four-hour solar day but also to refer to an indeterminate period of time, as in the many references to the coming "day" of the Lord (e.g., Isa. 2:12; 13:6, 9; Jer. 46:10; Ezek. 13:5; Amos 5:18, 20). In the creation account in Genesis, *Yom* refers to at least two different lengths of time; namely, the six *Yoms* of creation in Genesis 1 and the use of the same word in Genesis 2:4 to refer to the entire period of creation. Thus, it is quite reasonable to believe that the *Yoms* of Genesis 1 were indeterminate periods of time rather than the twenty-four-hour solar days that are often assumed by some Christians and some critics of the biblical account of creation.

The biblical evidence further commends this interpretation of the Hebrew word *Yom* in Genesis 1. Genesis 2 is an amplification of some of the creation events previously described in Genesis 1 for the sixth *Yom*, or period of time in Genesis 1, focusing especially on the creation of Adam and Eve, the first human couple. Genesis 1 places the creation of Adam and Eve in the sixth *Yom*. Yet Genesis 2 puts activities between the creation of Adam and Eve, such as Adam naming the animals and feeling lonely, that do not fit into a single sunrise-to-sunset scenario.²⁵

In summarizing this section, it is clear that the interpretation of the *Yoms* of Genesis 1 as indeterminate periods of time is clearly supported by the Bible itself. Such an interpretation eliminates the most glaring example of a contradiction between the Bible and science.

THE DEVELOPMENT OF FLORA AND FAUNA— EVOLUTION VERSUS CREATION

Here we address the classical creation-evolution debate. The Hebrew action verbs used in Genesis 1 to describe the creative activity of God are *bara* (Gen. 1:1, 21, 27), translated "create," and *asah* (1:7, 16, 25, 31), translated "make." The Hebrew word *bara* is used only thirty other times in the entire Old Testament, always implying at least some supernatural activity on the part of God, usually God creating something out of nothing. In contrast, the Hebrew word *asah* is used 620 additional times in the Old Testament, usually referring to the normal activities of people forming something from preexisting materials, refashioning something as it were. When *asah* is used elsewhere in the Old Testament to describe an activity of God, it often refers to God's providential care for his creatures in his customary way, such as when he makes the storm clouds bring the rain (Zech. 10:1). The use of both of these terms in the Genesis account seems to suggest that God used a combination of miracles plus "natural" processes to accomplish his creative purposes. Furthermore, the repeated reference to "plants and animals being made to reproduce after their own kind" in Genesis 1 seems to suggest natural limits to change.

If one takes the popular arguments for evolution at face value, then one might be persuaded that the Bible is indeed wrong about God using anything but "natural" processes to create the various types of plant and animal life found on earth. When people claim that evolution is a "fact," they are noting that simple things are found in the earliest part of the fossil record and more complex things are found in more recent strata. While it is assumed that mutation/natural selection can account for this progression in the fossil record, this is still a matter open to debate.

A distinction between microevolution and macroevolution needs to be made. By microevolution, I mean changes of existing characteristics or components in living systems by mutation/natural selection. This is both conceptually reasonable and appears to be supported by examples of speciation in the fossil record. What is not so clear is the origin of phyla and families in both the plant and animal kingdom. Macroevolution is the term used to describe change at this level, where new systems are brought into play. It is less obvious that changes that result in new systems requiring multiple component parts can occur in the same way that more modest changes occur, through mutation/natural selection generating the innovations.

Michael Behe, in his book *Darwin's Black Box*,²⁶ argues persuasively that multicomponent systems cannot be adequately explained by neo-Darwinian evolution (i.e., random mutation guided by natural selection). He gives a simple example of the mousetrap, which requires five to six parts to function in catching mice, and yet it cannot possibly be guided in its incremental development by natural selection. The component parts individually offer no selective advantage until all the necessary components reach a complex level of

development that allows them to begin to function as a unit. Citing examples in nature that are exceedingly more complex than a mousetrap, Behe describes black boxes in nature that are irreducibly complex. Once such a system is functional, natural selection can guide in the incremental improvements of the system, but the neo-Darwinian theory of evolution leaves unanswered the question of the origin of such systems.

The well-known atheist Richard Dawkins, in his book *Climbing Mount Improbable*,²⁷ posits that the backside of Mount Improbable has a “foot path” that leads from the bottom to the top of the mountain in small, easily manageable steps. He also acknowledges that if this path has major discontinuities (i.e., large steps), then mutation/natural selection cannot get one to the top of Mount Improbable. It is the nature of this path from simplicity to complexity, then, that holds the key to the efficacy of blind, undirected mutations in combination with natural selection to account for the plethora of flora and fauna we see today.

The ultimate example of irreducible complexity in natural history may be the origin of life.²⁸ Every cell of every living plant and animal requires extremely complex organic molecules such as DNA, RNA, and a variety of proteins to take care of minimal life functions. Yet the formation of these molecules under abiotic conditions is so challenging that it is difficult to imagine how it might have happened. The production and isolation of the mers, or organic building blocks, is very difficult, but getting the building blocks assembled to give function is so improbable as to defy logic or statistics regarding how it might have happened. The highly complex arrangements necessary for life might be quantified as information. Generating this information in an abiotic system is difficult to imagine. Remember, until these molecules are formed and arranged in a cell-like structure, there is no reproduction on which natural selection might work. Thus, the key to abiotic or chemical evolution must be something other than what is alleged for biological evolution.

There are two ways we can imagine God generating irreducibly complex innovations in natural history. First, God might use the process of evolution, but with the caveat that the mutations are no longer random but are guided by God in some miraculous way. It is worth noting here that claims by atheistic scientists that evolution by mutation/natural selection is “blind and undirected with no purpose” are nothing more than philosophy masquerading as scientific fact. There is simply no scientific basis for such a claim. A second way that God could have produced innovation is by using occasional fiat miracles to generate new plants or animals. The Cambrian explosion, during which almost all the major animal phyla appeared suddenly, might be the best example of a fiat miracle. In either case, the natural reproductive limits suggested by Genesis 1 could be exceeded only by God’s direct intervention.

God’s creative activity ceases after the creation of Adam and Eve at the end of the sixth *Yom* according to the biblical account. God rested in the seventh *Yom*, or period of time, which continues to our present time (Gen. 2:1–3;

Heb. 4:1–6). It is interesting to note that since the appearance of the human race, the extinction rate of species has increased significantly²⁹ due to human activity, whereas the formation of new species seems to have come to a halt. For example, biologists Paul and Anne Ehrlich of Stanford University claim that “the production of a new animal species in nature has yet to be documented.”³⁰ Thus, the biblical inference that creation of the various types of animal and plant life in some way involves God’s creative activity is not without warrant. It is difficult to explain the tremendous variety of animal and plant life that we see today if the rate of innovation has always been what it has been in the last thirty thousand years. Thus, it is perfectly plausible to posit that the much more dynamic innovation in natural history in the past was the consequence of God’s activity, whether by fiat miracle or by guiding the process of mutation/natural selection so that we are not left with only random mutations.

OVERALL CHRONOLOGY OF GENESIS 1 COMPARED TO GEOLOGICAL HISTORY

Creation of the universe (Gen. 1:1). One of the most remarkable features of the Genesis 1 account, despite the fact that it was written almost four thousand years ago, is its accord with “natural” history that has been written in the past two hundred years. Genesis 1:1 begins by claiming that the universe has not eternally existed but was created by God at a point in time. From the time of the Greeks, it has been fashionable to believe that the universe has eternally existed. Until the twentieth century, the idea of an eternal universe was supported by the scientific theories of conservation of energy and conservation of mass, which stated that neither energy nor mass could be created or destroyed. The big bang cosmology that has become almost universally accepted by cosmologists in the last third of the twentieth century clearly describes our universe as one that began, just as Genesis 1:1 indicates. It should be further added that the creation of the earth is explicitly mentioned in the account of this initial creation. Earth’s formation almost certainly required a combination of miracle (the initial big bang) and natural processes (or God working in his customary way), as described by modern cosmology, thus the use of the Hebrew verb *bara*, translated “created.” Stars that formed subsequent to the big bang by condensation burn via nuclear fusion to create the various elements, explode and recondense as new stars and planets, but with a much greater variety of elements than the first stars, which were largely hydrogen and helium.³¹ Unless God chose to miraculously sustain it in some other way, the earth could not simply float freely in space. Thus, the explicit mention of the creation of the earth in Genesis 1:1 implies also the creation of the sun during this initial creative episode.

Initial condition on planet earth (Gen. 1:2). Genesis 1:2 clearly implies that the creation account is to be taken as the point of view of an observer on the

face of the earth. The early earth is described as being “formless and void,” without the shapes of oceans and land masses that we see today, and devoid of life-forms and light. Hugh Ross describes the usual situation for newly formed planets, based on observations of astronomers during the past decade, as follows:

The theory and observations both confirm that all planets start with opaque atmospheres. Thick layers of such gases as hydrogen, helium, methane and ammonia surround them. Giant, cold planets such as Jupiter and Saturn perpetually retain their primordial opaque atmospheres. This gas cloud, combined with a dense shroud of interplanetary dust and debris, guarantees that no sunlight (or starlight) can reach the surface of a primordial planet such as early Earth. . . . The rule of thumb in planetary formation is that the greater a planet’s surface gravity and the greater a planet’s distance from its star, the heavier and thicker its atmosphere. Yet Earth departs from that rule. Theoretically, Earth should have an atmosphere heavier and thicker than that of Venus, but in fact it has a far lighter and much thinner atmosphere.³²

Thus, the biblical account is quite consistent with the conditions scientists would tell us should have existed on the early earth.

Earth’s atmosphere becomes translucent (Yom 1: Gen. 1:3–5). If Genesis is written from the point of view of an observer on the face of the earth and the sun has already been created in Genesis 1:1, then Genesis 1:3–5 must describe the first appearance of the sun’s light on the face of the earth. Over time, gravity removed dust and weightier material from the earth’s atmosphere. Furthermore, a very fortuitous set of circumstances allowed the earth’s atmosphere to become translucent, retaining just the right amount of water and carbon dioxide to keep the temperature moderate on the face of the earth.³³ Assuming that the earth is already spinning on its axis from the time of its creation, the first penetration of sunlight through the dense atmosphere also brings the first cycles of day and night to the surface of the earth.

Formation of the water cycle (Yom 2: Gen. 1:6–8). The formation of a perfectly balanced water cycle is crucial to life on planet Earth. If there were too much carbon dioxide and/or water in the atmosphere, then the temperature of the surface of the earth would rise monotonically, giving off more evaporation and causing a greater increase in temperature by trapping more heat and further increasing the temperature until the oceans were boiled dry. On the other hand, if the earth had insufficient greenhouse gases (e.g., water vapor and carbon dioxide), then the residual water might have condensed out of the atmosphere in the form of ice and snow. Since ice and snow have a high luminescence, the greater reflectivity of the radiant energy from the earth’s surface combined with the lower energy-trapping efficiency of the dry atmosphere would have caused all the water on the surface of the earth to be converted to ice and snow. Thus, the final product of an earth with just the right balance of water and carbon dioxide in the atmosphere and water in the oceans

to maintain a moderate temperature over much of the earth (2°C–40°C) is quite remarkable.³⁴

Formation of land (Yom 3: Gen. 1:9–10; Ps. 104:1–9). The formation of dry land is described next, again in a way consistent with known earth history. The dry land mass increased monotonically from 0 percent to the current 29 percent in the first four billion years of earth’s history through volcanic activity and plate tectonics.³⁵ During the past five hundred million years, the forces of erosion seem to have been balanced by the dry land-generating forces of volcanic activity and plate tectonics, giving us a relatively constant land mass. Particularly interesting is the recent scientific evidence that the percentage of land mass appears to be crucial to making earth a suitable habitat for life, and we now have just the optimal amount.³⁶ The Hebrew verbs used in Genesis 1:9–10 do not imply fiat miracle, so the implication of God working in his customary way through process is consistent with our scientific description of land mass formation by volcanic activity and plate tectonics.

Formation of plant life on land (Yom 3: Gen. 1:11–13). Consistent with geological history, the formation of dry land is followed by the beginning of plant life on this dry land. Hugh Ross has noted that the Hebrew words *zera*, *es*, and *peri* mean, respectively, “semen or embryos of any plant species,” “any large plant containing woody fiber,” and “the food and/or embryos produced by any living thing.”³⁷ English translations normally render these words “seed,” “trees,” and “fruit.” Thus, criticism that some plants mentioned in the third Yom in the Genesis account come later in geological history is due to the translation of general Hebrew terms for plants into very specific English terms that refer to some plants that do indeed occur later in geological history. Furthermore, the biblical account does not say that all plant life came into being during this third Yom, or period of time. Some additional plant life may have developed in the fourth, fifth, or sixth Yoms. Thus, the alleged inconsistencies between the biblical account and “natural” history are due to questions having to do with translation and interpretation, and these questions are resolvable.

The transformation from a translucent to a transparent atmosphere (Yom 4: Gen. 1:14–19). This passage has already been discussed in detail in the section on phenomenal language, and it is clear that this passage cannot possibly be describing the creation of the sun, the moon, and the stars. The first appearance of the sun, the moon, and visible stars is the natural consequence as the earth’s atmosphere is transformed from a translucent to a transparent state. The creation of plant life in the third Yom would take the carbon-dioxide-rich atmosphere and convert it into an oxygen-rich atmosphere with a concurrent translation from translucency to transparency. This would set the stage for the development of animal life. With the significant reduction of the greenhouse gases from the atmosphere, the sun, the moon, and the stars could be used for keeping calendars for the first time, as described in Genesis 1:14.

The creation of sea animals and birds (Yom 5: Gen. 1:20–23) and *land mammals* (Yom 6: Gen. 1:24–25). The introduction of sea animals, including sea

mammals and birds, is reported in the fifth *Yom* and the introduction of land mammals in the sixth *Yom*. The development of more complex animal life after the conversion of the carbon-dioxide-rich atmosphere to an oxygen-rich atmosphere is exactly what historical geology and geochemistry reveal. The only potential problem in this passage is the indication of sea mammals prior to land mammals, assuming the Hebrew word *nephesh* implies mammals, or creatures with more relational behavior. However, only a few land mammals are explicitly identified as having been created in the sixth *Yom*, leaving open the exact time for the emergence of other land mammals. Furthermore, recent discoveries of fossils of whales as far back as fifty-two million years ago seem to eliminate any credible challenge to the placement of sea mammals in the fifth *Yom*.³⁸ We will deal with human evolution in the next section.

Comparison of Genesis 1 chronology with other ancient writings. One of the most compelling arguments for the supernatural origin of the Genesis 1 account of creation may be made by comparing it to other ancient origin stories. In contrast to the very straightforward, factual, and accurate chronology of creation given in Genesis 1, the other accounts are clearly fanciful. A more detailed comparison than space will allow in this chapter may be found in the *The Genesis Connection* by Hugh Ross.³⁹

ORIGIN AND EARLY HISTORY OF THE HUMAN RACE: GENESIS 2-11

In this section, I will review details about the creation of Adam and Eve and try to see how these might be reconciled with anthropological findings. Then I will consider the possibilities for the long lives reported for early members of the human race. Finally, I will consider the spread of the human race after the flood.

Special creation of Adam and Eve (Gen. 1:26-27; 2:21-23). The Bible seems to clearly teach that Adam and Eve are real, historical people. Genealogies from the Old Testament and the New Testament trace human lineage back to Adam and Eve, which is difficult to imagine if Adam and Eve were only mythological or symbolic heads of the human race, as some have suggested they were. Giving God ultimate credit for creation and affirming a real, historical Adam and Eve are Francis Schaeffer's two nonnegotiables in his interpretation of Genesis 1 in his book *No Final Conflict*.⁴⁰

How might we distinguish the descendants of Adam and Eve from other prehistoric hominids? The key is in understanding what is meant by the fact that we are made in the likeness of God (Gen. 1:26-27). In the areas of moral conscientiousness, creativity, intelligence, and imagination, the human race shares unique traits in common with God and is God-conscious. Evidence for these characteristics includes the development and use of complex tools, the creation of symbolic art and artifacts, and burial of the dead.

What window of time might bracket the appearance of Adam and Eve? If the genealogies of the Bible are all first-person (father/son) genealogies, then

Adam and Eve would have been created approximately seven thousand years ago. However, the genealogies do not include identical lists of names, although they are similar. It seems that the genealogies must be important-person rather than first-person genealogies. Thus, Adam and Eve could potentially have lived much earlier in history. It is easy to imagine them living as far back as fifty thousand years, but it would be a stretch to put them as far back as five hundred thousand years. While bipedal, tool-using primates with large brains roamed the earth between five hundred thousand and one million years ago,⁴¹ religious relics including idols, altars, temples, art, and tombs for the dead have been found only as far back as about twenty-four thousand years ago.⁴² It appears that bipedal primates except for Neanderthals all became extinct before the advent of human beings,⁴³ and a biological link between Neanderthals and human beings has been ruled out.⁴⁴ Thus, the creation of spiritual beings Adam and Eve seems to fit what we know from anthropology.

The creation story in Genesis 2 is sometimes seen as conflicting with the one in Genesis 1. However, this is unnecessary. The obvious intent of the creation story in Genesis 2 is to amplify the creation account of Adam and Eve, emphasizing their spiritual relationship with God. Only the most wooden interpretation of Genesis 2 would put the creation of man before the creation of plants and animals. The planting of the Garden in Genesis 2 is distinct from the creation of plant life in Genesis 1, which occurs much earlier in geological history. God's creation of various kinds of animals and his act of bringing them to Adam in Genesis 2:19 should not be interpreted to imply that Adam was created first. Genesis 1 has already clearly given the creation chronology. Genesis 2:19 alludes to the prior creation of animals, which God now brings to Adam in the Garden to be named.

The indication in Genesis 2:21-22 that Eve was fashioned from a rib of Adam (figuratively speaking) does not imply that Eve was fashioned only from Adam's rib. A better interpretation might be that God used Adam's rib like a DNA blueprint (as in genetic engineering) with appropriate modifications so that Eve was genetically related to Adam but distinctively different as well. Eve's formation, however, almost certainly required other "construction materials" besides the proverbial rib.

Long lives of human beings before the flood. One of the most vexing questions involves accounting for the long lives—more than nine hundred years—of the early descendants of Adam and Eve. Other ancient writers also indicate similarly long lifetimes for their ancestors.⁴⁵ I used to wonder if they were counting full moons as years, in which case these numbers would be reduced by a factor of twelve to a more reasonable seventy-five to eighty years of life. However, a careful reading of Genesis 5, taking into account this hypothesis, would have the early patriarchs beginning their families when they were between five and ten years of age, which is clearly unrealistic. Furthermore, God imposes a new restriction on the lives of human beings in Genesis 6:3, limiting them to 120 years to control their wickedness, which seemed to grow

worse with age. After a short transition period (see Gen. 11:10–25), the life spans of biblical characters all seem to fall within this 120-year limit (e.g., Joseph dies at the age of 110, Moses at 120). It is interesting to note that people to this day do not seem to live longer than 120 years and seldom live to be older than 100 years.

Why is it that in Genesis 1:29 God commends to Adam and Eve a vegetarian diet, while in Genesis 9:3, after God has reset the limits on human longevity, he now includes meat in their diet? If one eats meat, one ingests a much higher concentration of heavy elements that over time can accumulate in the body.⁴⁶ If one lives nine hundred years, this would become a serious problem. If one lives 120 years or less, the accumulation never reaches levels that would adversely affect one's health. Thus, this change in diet is also consistent with the dramatic change in longevity of human beings indicated in the Bible.

The Bible does not indicate how God reset the biological clocks of human beings to reduce life spans to the current levels. However, recent scientific findings suggest some intriguing possibilities.⁴⁷ It is well known that high intensity radiation can dramatically shorten the life span of a human being, as evidenced by the aftermath of Hiroshima, Nagasaki, and Chernobyl. If the level of background radiation for the earth changed significantly around the time of the Noachian flood, this might account for the change in life spans noted in the Genesis account. The most likely candidate to have provided such radiation is the Vela supernova, which produces more than thirty times the radiation on earth of the next most intense supernova.⁴⁸ It has been dated to have exploded between ten thousand and thirty thousand years ago, a time period that brackets the dates one would expect for the Noachian flood.

A second possibility is a cell phenomenon called apoptosis that ultimately limits longevity.⁴⁹ Human cells are apparently designed to reproduce only a fixed number of times, after which the reproductive process shuts down. This would set an absolute limit on longevity, assuming one does not die for other reasons first. Recent research suggests that apoptosis may be a powerful force in countering the growth of cancer cells. If this is the case, then the introduction of apoptosis, which limits life to 120 years, may have been essential to mediate the greater incidence of cancer that the Vela radiation would surely have produced over time.⁵⁰

Spread of the human race after the flood. If all members of the human race except Noah's family died during the flood, then all members of the human race today should be descendents of Noah. Furthermore, the spread of the human race to its present geographical distribution should have occurred after the flood. We know that the migration of human beings from East Asia to North America occurred roughly 10,000 B.C.,⁵¹ since the Bering Strait was passable by land for a brief time between 9,000 and 12,000 B.C. During this same period of time, a lower ocean level would have made passage between the various Indonesian islands and on to Australia much easier either by land or by a short boat journey in waters that were much warmer than the Bering

Sea. A subsequent increase in the ocean levels due to the melting of ice would have restricted subsequent migration to or from these locations. This would positively date the Noachian flood prior to 10,000 B.C., which is consistent with the dating of the flood and the concurrent reduction of life spans of human beings ten thousand to thirty thousand years ago. Anthropological data previously cited put Adam and Eve at possibly twenty-four thousand years ago. Thus, the biblical events of the history of the human race are quite consistent with relevant scientific data.

THE FLOOD OF NOAH

The flood of Noah is one of the greatest events of Genesis 1–11, and, like young earth creationism, is the source of considerable scorn regarding the reliability of the Bible. But as with the question of the age of the earth, the controversy here is unnecessary if one reads and interprets the passage carefully. The fundamental question is whether the Noachian flood was global or local.

The terminology used in Genesis 6–9 seems to favor a global flood. For example, Genesis 7:19–23 says, "The water prevailed more and more upon the earth, so that all the high mountains everywhere under the heavens were covered. . . . Thus He blotted out every living thing that was upon the face of the land, from man to animals to creeping things and to birds of the sky, and they were blotted out from the earth" (vv. 19, 23 NASB). The use of such biblical language in other stories may help us to understand the intention here. In Genesis 41:56, we are told, "The famine was spread over all the face of the earth" (NASB). We normally interpret this famine as devastating the lands of the ancient Near East around Egypt and do not assume that American Indians and Australian aborigines came to buy grain from Joseph. First Kings 10:24 states that "the whole world sought audience with Solomon to hear the wisdom God had put in his heart." Surely Inca Indians from South America or Maoris from New Zealand had not heard of Solomon and sought his audience.

The Hebrew word *erets* used in Genesis 7:19 is usually translated "earth" or "world" but does not generally refer to the entire planet.⁵² Depending on the context, it is often translated "country" or "land" to make this clear. References to the entire planet are found in Genesis 1:1; 2:1; and 14:22, for example. However, more typical references might be Genesis 1:10; 2:11; or 2:13, where *erets* is translated "land." In Genesis 12:1, Abram was told to leave his *erets*. He was obviously not told to leave the planet but rather to leave his country. Genesis 41:56 describes the famine as being over all the face of the *erets*, which could be translated "land," "country," or (entire) "earth." Obviously, the famine did not literally cover the entire earth. Again, in Exodus 10:5, 15, we are told the locusts covered the surface of the *erets*. Translating *erets* as "earth" here would not make sense. We see once again, as with the Hebrew word *Yom*, that the small and limited vocabulary of the Hebrew language requires that many Hebrew words have multiple meanings, with the

actual meaning determined by the context. A final helpful comparison to obtain a proper interpretation of Genesis 7:19 involves Deuteronomy 2:25, which talks about all the nations “under the heavens” being fearful of the Israelites. Obviously, all nations “under the heavens” was not intended to mean all on planet Earth.

The Hebrew word translated “covered” in Genesis 7:19 is *kasah*. It can mean “residing upon,” “running over,” or “falling upon.”⁵³ Twenty feet of water running over or falling upon the mountains (or hills) is quite different from that amount residing upon them, although either event could destroy human and animal life in its path. The Hebrew word *har* translated “mountain” in most English translations of Genesis 7:19 also means “hill” or “mount.”⁵⁴ Thus, we might as easily translate Genesis 7:19 to say that “all the high hills in the region of the Mesopotamian valley were covered with water to a depth of more than twenty feet.” This is very different from the usual rendering that “all the highest mountains on the earth were covered with water to a depth of twenty feet.”

In the New Testament, Paul claimed that the faith of the Roman church was being proclaimed “throughout the whole world.” Peter notes in 2 Peter 3:6, “By . . . waters also the world of that time was deluged and destroyed.” The Greek word here is *kosmos*, otherwise translated “whole universe,” “whole planet Earth,” the “whole of humanity,” or a “portion of the earth.” Obviously, Paul meant the world of the Roman Empire, or a portion of the entire earth. Peter’s intent was clearly all of humanity.⁵⁵

In Genesis 1–9, the only geographical references are to the region of Mesopotamia. If the ancestors of Noah had elected to stay in this general region rather than spread throughout the earth as God had commanded, then God’s judgment would require only a flood in this region, and this appears to have been the case.

If the entire Mesopotamian valley was flooded and the water receded slowly, then Noah might have seen only water, with distant mountain ranges being over the horizon. God’s use of wind in Genesis 8:1 to cause the flood to subside would be reasonable for a local flooding of this huge valley. It would not make sense for a flood that left water to a depth of thirty thousand feet, sufficient to cover Mount Everest. Genesis 8:4 indicates that the ark came to rest on the hills or mountains of Ararat, not specifically Mount Ararat, which is seventeen thousand feet tall. This complex mountain range extends north and east of Mount Ararat down to the foothills skirting the Mesopotamian plain. If the ark had landed near the top of Mount Ararat, it is difficult to imagine how Noah and his family as well as the animals would have been able to descend to the base of the mountain, given the considerable difficulty mountain climbers have today attempting to reach the locations where the ark is thought (I believe, incorrectly) to have landed.

Further evidence for a local flood is found in Genesis 8:5, where it is noted that the water receded until the tenth month when the tops of moun-

tains (or hills) became visible for the first time. The reference here seems to be what Noah could see, not the entire world. In Genesis 8:11, the dove returns with an olive leaf. Since olive trees don’t grow at higher elevations, a flood that covered all the mountains would not give this type of evidence of receding.

One can estimate the total amount of water that would be needed to cover all the mountains on the face of the earth and compare this to the total water reserves that we know of on planet Earth, both in lakes and oceans and in subterranean aquifers. A flood that covered all the mountains on earth would require 4.5 times the total water resources that exist on planet Earth. Furthermore, such a worldwide flood would be pointless if the descendants of Adam lived only in the region of Mesopotamia.

While scientific evidence for a worldwide flood is clearly missing, there is considerable evidence from both geology and archaeology of one huge and several smaller floods in the region of Mesopotamia during the time period of the Noachian flood. Fredrick A. Filby, in *The Flood Reconsidered*, summarizes his chapter on this topic as follows:

Some time after the Ice Age and before the rise of the great dynasties, a great flood caused by either a close approach of some heavenly body, or by the movement of the continents, or both swept from the Atlantic, the Mediterranean, and the Indian Oceans over much of Europe and Asia. During this period Paleolithic man disappeared, the entire climate of Siberia was radically changed, herds of mammoths were completely eliminated, some being apparently almost instantaneously frozen to death by unprecedented cold, and the sabre-tooth tiger, the woolly rhinoceros and a hundred million other creatures perished. Herds of animals in Europe and Western Asia were trapped by rising water and many were dashed to pieces, their bones being swept into great cracks, which had appeared in the earth. Lesser risings and fallings of certain local areas have continued, giving rise to raised beaches, shifting levels of fens in England, or various flood levels in Mesopotamia, but these are obviously small compared with the event which drowned a hundred million animals and exterminated an ancient race of men. The great oceanic tide, accompanied in the Middle East by torrential rain, and in Siberia by intensely frozen snow, capable of floating and indeed of driving a 10,000 ton wooden barge, probably from Mesopotamia to the regions of the mountains (or hills) of Ararat . . . that Flood which Genesis describes so minutely, was surely unique in history, and, by the promise of God was not to be repeated—and in fact, never has been.⁵⁶

It should be noted that Filby’s account, which was completed before 1970, would place the flood between four thousand and ten thousand years ago, but after the last ice age. Hugh Ross’s more recent treatment of this topic would place it somewhat earlier, with humans bridging the Bering Sea to populate North and South America about eleven thousand years ago, before the ice

melted and the sea levels rose.⁵⁷ This would put Noah's flood between probably ten thousand and twenty thousand years ago.

THE FALL OF ADAM AND EVE AND THE RAINBOW

A couple of minor details need to be addressed before we conclude this chapter. Some claim that Genesis 2:5–6 in combination with the rainbow mentioned for the first time in Genesis 9 should be interpreted to mean that rain never fell before the flood. However, both Filby and Ross argue convincingly that God always takes something familiar and gives it a special significance when he makes a covenant (e.g., bread, wine, and water).⁵⁸ Thus, there is no reason to assume that the rainbow appeared for the first time in Genesis 9. Rather, it was given a special significance for the first time in Genesis 9.

Second, some speculate that the curse on nature after the fall was the introduction of the Second Law of Thermodynamics. This cannot possibly be the case since the capacity of nature to utilize energy flow is made possible by the Second Law of Thermodynamics. Furthermore, transport phenomena that are essential for life would not be possible without the Second Law of Thermodynamics. It is certain that nature changed in some way at the time of the fall, but it is unclear what that change might have been physically.

CONCLUSION

The Bible may be interpreted to give the following scenario for the origin of the universe (including earth), the origin of plants and animals, the origin of human beings, and the early history of the human race:

- The universe was created with a miraculous big bang followed by processes described by cosmology that resulted in stars and planets some twelve billion years ago.
- The earth originally had an opaque atmosphere and was covered with water and in complete darkness.
- The atmosphere eventually became translucent, allowing diffuse light to reach the surface of the spinning earth, giving for the first time day and night on the surface of the earth.
- Land began to form through the processes of volcanism and plate tectonics, again by God working in his customary way.
- The origin of the first life was not mentioned specifically in the Genesis account but almost certainly would have required miraculous intervention on God's part.
- Plant life developed on the newly formed land mass, possibly by process or by God-directed mutations.

- Subsequently, sea and land animals appeared, with the verbs indicating a combination of miracle plus process (maybe events such as the Cambrian explosion are evidence of God's creative activity).
- Since the creation of humankind, God has withdrawn from his creative activity, and, not surprisingly, the introduction of new family or phyla (maybe even species) seems to have come to a halt since the appearance of man.
- Human beings appear to be a special creation of God and not the end product of hominid evolution.
- Human beings are distinguished by their spiritual aptitude and practice and appear to be relatively recent, possibly coming into existence twenty-five thousand years ago.
- Early human beings apparently lived for nine hundred or more years, but radiation from a supernova may have shortened life spans to their current roughly one-hundred-year maximum, or God may have reset our cellular clocks to the current limit at about the time of the flood.
- The flood appears to have occurred between ten thousand and twenty thousand years ago and was local.
- The earth was populated by the descendants of Noah and his family since the flood.

Amazingly enough, this picture from Genesis is extremely consistent with what we know from science. The alleged contradictions of the Bible by science are the result of an improper reading of the Bible (e.g., *Yoms* of Genesis 1 are solar days; the flood was worldwide, covering all the mountains with water) and/or an exaggerated inference from science about the creative powers of nature alone (e.g., the origin of life and macroevolution are easily explained by natural processes alone).