



Search

Back

Table of Contents for this issue.

Home
Current Issue
Archives
Book Reviews
Subscriptions
Advertise
Contact Us
Store
EJ International Editions
Text-Only View

## The Case for an Old Earth

(The Literary Framework Interpretation)

*Is the 7-day creation account meant to be chronological or is it meant as a literary framework or symbolic structure designed to reinforce the purposefulness of God in creation?*

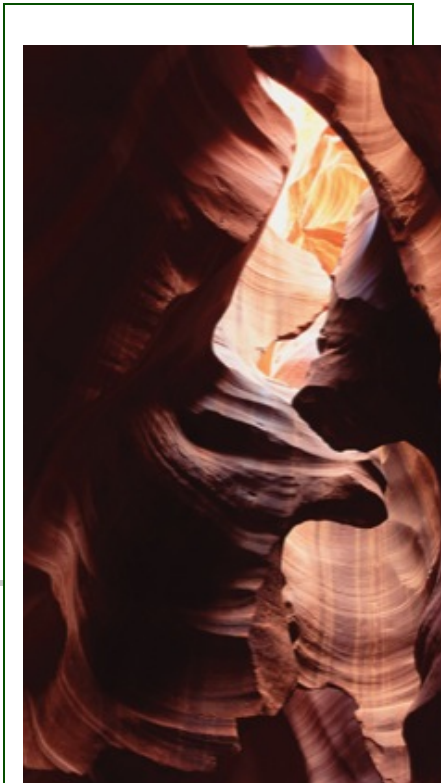
By Davis A. Young

The Assemblies of God Statement of Fundamental Truths starts with this statement about the Bible: "The Scriptures, both the Old and New Testaments, are verbally inspired of God and are the revelation of God to man, the infallible, authoritative rule of faith and conduct."<sup>1</sup> While God's Word is both inspired and infallible, human interpretations of it are neither. This is especially the case when it comes to using the Bible to make or buttress scientific claims. Here are a few examples.

### HISTORICAL BACKGROUND

In his fifth-century work, *The City of God*, church father Augustine maintained, in part on scriptural grounds, that people did not inhabit the opposite side of the earth. The Australian aborigines would have begged to differ.

In 1613, someone found a set of large fossil bones in the province of Dauphiné, France. Amid dispute over identity of the bones, some suggested that this creature, which scientists named *Theutobochus*, might be human. Nicolas Habicot suggested the bones belonged to one of the giants mentioned in Genesis 6:4. After rediscovery in the 20th century, scientists properly identified the misplaced bones as *Dinotherium*, a large extinct relative of the elephant.



### SEE ALSO:

- For further reading, see Davis Young's [The Bible, Rocks and Time: Geological Evidence for the Age of the Earth](#)

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In 1726, naturalist Johann J. Scheuchzer, reporting on a 6-foot-long fossilized skeleton that workers had recently discovered in a quarry at Öhningen, Switzerland, pronounced the remains to be those of an individual who perished in Noah's flood. They dubbed this unfortunate victim *Homo diluvii testis* — the man witness of the flood. In 1809, however, Georges Cuvier, known to science as the father of vertebrate anatomy and paleontology, carefully examined the fossil and demonstrated that it was in reality an extinct giant salamander.

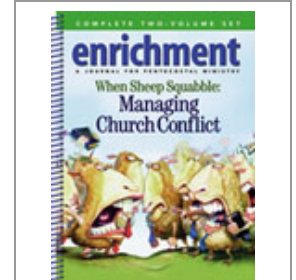
In other situations, the entire Christian community held erroneous scientific beliefs on the basis of presumed biblical teaching. For example, in the 17th century, natural philosophers, such as the eminent John Ray, had difficulty accepting the belief that fossils were the remains of extinct creatures because of a widely held concept — the plenitude of creation. Scholars of the era, on the basis of Genesis 1:31, believed that God's original creation was perfect. They reasoned it was not possible for any group of organisms created by God, e.g., the tiger or the robin, to pass out of existence. Extinction connoted imperfection. The idea of plenitude crumbled, however, when the reality of biological extinction became undeniable. The dodo became extinct in the mid-1700s. Fossils of the ground sloth, mastodon, and woolly mammoth, all known from discoveries in 18th-century America, clearly no longer existed. The last passenger pigeon died in 1914. We now know that by the 15th century the Maoris of New Zealand hunted to extinction several species of moa, a bird considerably larger than an ostrich. Extinction is a reality.

Finally, the case that everyone knows about. Until the time of Copernicus (d. 1543) and Galileo (d. 1642), virtually everyone assumed the earth was a stationary body around which all the heavenly bodies revolved daily. Scripture seems to teach the immovability of the earth (Psalm 93:1; 96:10). Joshua 10:13 says the sun stood still during the battle in the valley of Aijalon. However, a growing body of physical evidence demonstrated that a mathematically and physically far simpler explanation of the astronomical observations entailed revolution of the earth and the other planets around the sun.

All these cases involved either an appeal to allegedly plain statements or an inference from Scripture to draw a scientific conclusion about the nature or behavior of an aspect of the created world. In every one of these cases, continued scientific investigation rendered the supposed biblical view to be ill founded. What I am driving at is this: The Christian community has a poor track record when it invokes the Bible as a basis for drawing scientific conclusions about the world. Over and over scientific investigations have shown the incorrectness of biblical interpretations employed in the service of science.

This poor track record persists. One prominent example concerns the age of the earth. A substantial percentage of Christians assume, if not insist, that the earth (and the cosmos) are only a few thousands of years old on the basis of their interpretation of Genesis 1 and of the genealogies in Genesis 5 and 11. Some Christians claim that scientific evidence supports the young-earth position. The problem is that geological evidence accumulated since the mid-1700s to the present by tens of thousands of geologists overwhelmingly supports the view of an extremely ancient earth with a long, complex, dynamic history.

The geological community does not dispute the great age of the earth as if it had not yet decided the issue. It has. The scientific community has discovered strong evidence that the earth is about 4.5 billion years old and that the universe is about 13.7 billion years in age.<sup>2</sup> Findings of geology and astronomy force us to conclude that the commonly held view that the Bible teaches that the earth is only a



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few thousand years old is incorrect.

It will not do to argue that hostile, atheistic unbelievers have collected the so-called evidence and that gullible Christians, eager to gain acceptance in the scientific community, have naively been taken in. That claim is both insulting to the generations of hundreds, if not thousands, of Christian geologists. It is also historically false because Christians, such as Adam Sedgwick and William Buckland, were among those whose scientific contributions helped establish the view of the great antiquity of the earth. Today there are hundreds of Bible-believing Christian geologists (many of whom belong to the Affiliation of Christian Geologists). All but a few are totally convinced of the vast antiquity of the earth.

## **GEOLOGICAL EVIDENCE**

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Let us look at why geologists think the earth is old. Geologists recognize three major categories of rocks: sedimentary, igneous, and metamorphic.

### **Sedimentary rocks**

Early in the 19th century when geology was in its infancy as a science, investigators primarily studied the layered sedimentary rocks, such as sandstone, shale, limestone, and coal — all deposited on the earth's surface, typically from water. The early geologists concluded that the earth is very old.

Sedimentary rocks — formed from vast accumulations of sand, silt, gravel, and lime — typically occur in stacks of layers that may be thousands of feet thick. For example, in the Appalachian Mountains of Pennsylvania, the thickness of the sedimentary rocks exceeds 40,000 feet. Sediment thickness in the Gulf Coast may exceed 60,000 feet. Sedimentary rocks bear evidence of formation in a wide variety of environments: river deltas, lakes, beaches, the deep ocean, shallow seas, desert basins, and glacially carved valleys.

Deposits of extremely thin layers of very fine-grained silt and clay are in stacks on lake bottoms. Cemented sand dunes or beach deposits formed sandstones composed mostly of quartz. Limestone commonly contains fossils indicative of shallow marine environments. Extremely fine-grained black shale likely accumulated on deep-sea bottoms. These stacks of sedimentary rock layers, therefore, contain abundant evidence for continual transitions in environments, strongly indicative of passage of a lot of time.

### **Igneous rocks**

Igneous rocks solidify from intensely hot molten rock called magma. Magma may cool very rapidly on the surface of the earth as lava, particularly if the lava flow is very thin. But gigantic volumes of coarse-grained igneous rock, such as granite, cool very slowly far beneath the surface. At the surface in the coastal mountains of British Columbia, the Sierra Nevada of California, the Andes Mountains, and elsewhere these so-called batholiths are now exposed. The crystallization time of batholiths took tens to hundreds of thousands of years. Geologists are able to calculate the crystallization time from temperature and other thermal properties — size, shape, and depth of intrusion of the magma in the batholith — and the temperature and other thermal properties of the wall rocks into which the magma is injected.

### **Metamorphic rocks**

Because metamorphic rocks require high temperature and pressure they, too, formed far beneath the surface. Many metamorphic rocks were originally sedimentary rocks. Unique mineral compositions, preservation of typical sedimentary rock features, such as cross-bedding and the presence of fossils, are among the indicators of surface origin.

Experimental data on the stability of minerals in metamorphic rocks permit estimation of the temperatures and pressures attained by rocks. In some instances, metamorphic rocks reached temperatures above 1,500 degrees Fahrenheit and pressures that could only be generated 10s of miles below the surface. It requires an exceedingly long period of time for a few hundred cubic miles of rock to be buried 5 or 10 miles beneath the surface; for the rocks to heat up from surface temperature to a very high temperature; for the original minerals to react and recrystallize to new minerals; for a cause of uplift to become available; for the overlying rocks to be eroded away as the newly formed metamorphic rocks were uplifted back to the surface; and for the metamorphic rocks to cool to surface temperature as it rose.

### **Geological example**

The geology of almost any region on earth preserves a record of an extremely complex history that had to take a long time. This is particularly the case in mountainous regions, such as the area around Salt Lake City, Utah.

Just east of Salt Lake City is the beautiful north-south trending Wasatch Range, which consists predominantly of a sequence of layered sedimentary rocks, such as sandstone, siltstone, mudstone, conglomerate, and limestone, tens of thousands of feet thick. These rocks are steeply tilted, typically downward toward the east. They contain evidence of deposition on tidal mud flats, in river floodplains, in shallow marine environments, and even at the margins of melting glaciers — indicative of slowly changing environmental conditions as the sediments were deposited. This thick sedimentary rock stack was deposited on a very irregular, more or less horizontal surface that separates the sedimentary rocks from a thick mass of underlying metamorphic rocks. Geologists call this surface an *unconformity*, that is, an ancient buried erosion surface — a fossil land surface. Before the sediment stack was ever deposited, the metamorphic rocks were uplifted to the surface as overlying material eroded away. Before that they had been buried and heated.

The sediment layers were deposited on that erosion surface, but now they are tilted toward the east. What caused that tilting? Modern-day earthquakes on the western boundary of the Wasatch Range indicate that the 150-to 200-mile-long Wasatch Fault Zone is still active. Movements on this fault zone are approximately vertical. The rocks east of the fault zone are rising, and the rocks west of the fault zone are subsiding relative to the east side. The movement along the Wasatch Fault Zone resulted in both elevation of the Wasatch Mountains and rotation of the large rock mass that composes the mountains. The documented vertical movement on the fault zone is several thousand feet. In essence, a series of perhaps thousands of earthquakes, large and small and acting over a long period of time, produced the Wasatch Range.

The stack of sedimentary rocks, however, was also affected prior to the time of uplift and faulting. They were affected by movement along more nearly horizontal thrust fault surfaces, along which rocks have shifted west to east as much as 40 miles, much like a carpet that has been shoved across the floor.

Also prior to the episode of uplift and tilting, several large pulses of magma intruded into the stack of sedimentary layers and through the thrust faults to form masses of granite. These magma bodies crystallized about 7 miles beneath the surface, but they are now exposed at the surface. It required hundreds to thousands of years for such intrusions of this size to crystallize at this depth and then cool to surface temperature as the 7-mile thickness of overlying rock eroded away during later elevation of the Wasatch Range.

West and south of the Wasatch Range is an enormous basin that

contains the Great Salt Lake, Utah Lake, and Sevier Lake. These lakes are small remnants of a much larger lake, Lake Bonneville, that occupied approximately 20,000 square miles and was more than 1,000 feet deep at its maximum extent.

Around the Salt Lake City area one can clearly identify several sets of benches etched into the lower slopes of the hills and the Wasatch Range. These benches are the remnants of former shorelines of Lake Bonneville. West of Great Salt Lake is a thick deposit of salt that formed while Lake Bonneville experienced as many as 28 extensive episodes of evaporation and refilling.

To summarize, the aspects of the history of the Salt Lake City area began with metamorphism. It was followed by uplift and erosion to produce a land surface on which a thick pile of sediments was deposited in a succession of changing environments ranging from shallow marine to river to glacial. The loose sediments cemented to form sedimentary rocks, and later deformed and displaced horizontally along thrust faults. Several intrusions of magma crystallized to granite. Still later, movements on the Wasatch Fault Zone caused tilting and rotation of the Wasatch Mountains block. Lake Bonneville was then formed and persisted for several thousands of years during the Ice Age. Erosion and uplift of the Wasatch Mountains continue.

The information provided here gives a relative order of geologic events and a sense of the passage of "a lot of time." But how much time? Can we determine the exact ages of rocks and fossils? Yes.

## **DETERMINING AGE**

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We can determine the ages of items that are only a few thousands of years by a range of methods, including: tree ring, thermoluminescence, obsidian hydration, archaeomagnetic, amino acid racemization dating, varve counting, and other methods. For most very old geological materials, geologists turn to an impressive arsenal — radiometric dating. Geologists apply different radiometric methods to different rock types that they suspect of falling into a particular age range.

We can now date the times of crystallization of magma, the solidification of a lava flow, the recrystallization of a metamorphic rock, the formation of some sandstones from loose sediment, the disruption of the parent body of a meteorite, the length of exposure of a surface rock to erosion, the formation of cave deposits, the formation of glacial ice layers, and much more. There are also radiometric methods for determining the age of the earth, the moon, and meteorites. They all generally come out around 4.5 billion years. Meteorite ages are remarkably consistent at 4.5 billion years. The oldest known rocks on earth are close to 4.4 billion years.

The radiometric methods involve the decay of radioactive forms (called isotopes) of chemical elements, such as uranium, potassium, samarium, rubidium, and others, into different elements, such as lead, argon, neodymium, and strontium. Scientists have accurately measured the decay rates of radioactive isotopes. Numerous experimental studies have demonstrated that changes in temperature, pressure, electrical fields, magnetic fields, or the minerals in which the radioactive elements occur do not significantly affect the decay rates. Scientists thoroughly understand the physics and mathematics of radiometric dating, and the geologic conditions affecting the occurrence of the radioactive elements and their decay products.<sup>3</sup> Geologists have great confidence in the results of these well-tested methods.

## **BIBLICAL INTERPRETATION**

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What should Christians make of the discovery that their earthly home

is 4.5 billion years old? Is there a conflict between geology and Genesis 1 and biblical genealogies? If the Bible is infallible, must we reject the findings of science? Not at all. Rather than view, with suspicion, the virtual consensus among geologists about the vast age of the earth, Christians need to think of science as a gift from God that provides a tool to help us interpret the Bible more properly. Science may not yield a positive interpretation of a biblical passage, but it may help to filter out incorrect interpretations. The scientific knowledge that the earth is billions of years old suggests that the traditional, literal, 6-24-hour day view of creation, a few thousand years ago, is unlikely to be correct. This conclusion should stimulate biblical scholars to search for a more satisfactory interpretation.

Without being dogmatic, I offer a few suggestions. The Old Testament writers lived in a culture far different from the one in which we live. The ancient Israelites knew little about the size, shape, or age of the earth. They did not know that the earth is a globe. They did not know the distances to stars. Their picture of the world was quite different from ours and included a flat earth around which the sun and stars revolved daily.

We have learned from archeology that ancient authors used distinctive literary conventions and symbols. If we are to understand Genesis 1 properly, we must understand the ancient Near Eastern culture of those to whom the writers addressed. The pagan, polytheistic cultures of Mesopotamia, Egypt, and Canaan surrounded and affected the Israelites of old. Israel needed to understand that the so-called gods of the surrounding pagans had no power and that nature had no power to generate "gods." Israel's God was the sole, absolute Creator of heaven and earth. Genesis 1 is not merely the story of creation but also a broadside against the pagan deities. The heathen gods included trees, stars, rivers, sun, moon, birds, and mammals. These things are not in the least divine — they are creatures, pure and simple, called into being effortlessly at the verbal behest of the all-powerful God.

Readers of Genesis 1 also need to keep in mind that people in the ancient Near East commonly used the number seven, not simply as a literal number, but as a symbol for completeness. Ancient Near Eastern epic literature, from the Gilgamesh Epic in Mesopotamia to the Ugaritic Poem of Baal and Anath, Legend of King Keret, and Tale of Aqhat is awash in the symbolic use of the number seven, as is the Bible, particularly Revelation. Moreover, people in the Ancient Near East widely used the six plus one, 7-day structure of Genesis 1 as a literary convention for a completed action with a climax on the "seventh day." The first 6 days (of creation) are referred to in Hebrew without use of the definite article as day one (or first), day second, day third, day fourth, day fifth, day sixth. They refer to the climactic day of rest as "the day the seventh." This pattern is very similar to that employed in the literature noted above. The point of the literary convention is to highlight a completed, finished event, including a dramatic climax, and not to insist on creation of the world in a literal 144 hours.

Widespread use of numerology and other structural features in Genesis 1 suggests a dramatic, artistic, topical intent by the author. The first 3 days of creation stand in symmetrical relation to the last 3 days. Days 1 and 2 each record one creative event marked by "And God said, 'Let. ...' ": light (day 1) and firmament (KJV, day 2). On day 3 there are two creative events: appearance of land from sea (day 3a) and creation of plants (day 3b). Days 4 and 5 each record one creative event: heavenly bodies (day 4) and birds and fish (day 5). On day 6, the parallel of day 3, there are again two creative events: land animals (day 6a) and man (day 6b). Scholars have noted for centuries the similarity of content of these two sets of days. Days 1 and 4 focus on light and light-bearers. Days 2 and 5 focus on the firmament and water, whereas day 5 introduces birds under the firmament and fish

in the water. Day 3 mentions creation of land and plants, and day 6 mentions animals of the land and the plants as food for the animals and man.<sup>4</sup>

In summary, Genesis 1 teaches us about the Creator and His work in artistic terms, but does not intend to give us a condensed version of geological history or information about the age of the earth. The Creator has endowed us with the curiosity and skill to figure that out on our own. Moses intended that the divine revelation of Genesis 1 would introduce us to our Creator God.



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## Notes

1. [Assemblies Of God Statement Of Fundamental Truths.](#)
2. For a historical summary of some of the geological evidence that led to the acceptance of an extremely old earth, see D.A. Young and R.F. Stearley, *The Bible, Rocks and Time* (Downers Grove, Illinois: InterVarsity Press, 2008).
3. For more detailed information on radiometric dating with several examples, see chapters 14, 15 in Young and Stearley, *The Bible, Rocks and Time*. See also D.A. Young, 2006, "How Old Is It? How Do We Know: Part One," in *Perspectives on Science and Christian Faith* v. 58: 259–65.
4. For further reading, see John Walton, *The Lost World of Genesis One* (Downers Grove, Illinois: InterVarsity, 2009) and John H. Stek, "What Says the Scripture?" in *Portraits of Creation*, ed. Howard J. Van Till (Grand Rapids: Eerdmans, 1990), 203–65.

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