

February 2011

HOW DID THIS HAPPEN?

By Phil Johnson, MCE

The Grand Canyon is probably the most famous geologic formation in the world. It is 216 miles long,¹ 4–18 miles across, and about a mile deep. The first question most visitors express is, “How did this happen?” Many geologists have tried to answer this question and have proposed different theories as to how the canyon was formed.

Geologists saw the power of moving water through catastrophic failures of dams that breached. In 1889 the Johnstown flood and the 1976 Teton Flood in Idaho, breached dams caused loss of life and showed quick catastrophic geological events. Unfortunately, in geology, invoking catastrophes violates a “sacred rule,” any explanations should involve only processes we see today. This assumption, known as uniformitarianism, still underlies most geological thinking today.

In 1869, John Wesley Powell proposed the formation of the Grand Canyon with eons of time, causing the thousands of feet of limestone, shale, and sandstone layers were deposited. The earth cooling from its earlier molten state was contracting and shriveling. As the Colorado River flowed along its present course about 65,000,000 years ago, the rocks began folding, uplifting, and tilting. The Colorado Plateau rose slowly so that the river was never blocked, therefore cutting out the Grand Canyon.²

In 1875, Grove Karl Gilbert stated that faults developed in the Colorado Plateau as it rose over long periods of time. These faults, or cracks, allowed the Colorado River to flow through the Kaibab Plateau and carve the Grand Canyon.³

Samuel Franklin Emmons, in 1897, stressed that to form the Grand Canyon, either the Colorado River cut down through the rock layers below, or the land below rose up and was cut by the river. Emmons provided valid but complex details but essentially ended up saying that the river settled down through the land and carved the Grand Canyon by superposition.⁴

Eliot Blackwelder theorized in 1934 that the Colorado River did not exist until about 1.8 million years ago. As the Rocky Moun-



The Grand Canyon

tains rose their last mile or so, they intercepted much more moisture from the westerly winds so rivers flowing down the western slopes of the mountains became more powerful. River drainage into basins west of the Rockies increased, while the cold climate of the ice age reduced evaporation. Therefore, western lakes grew and sometimes breached their banks, carving canyons down to the next lower lake. By this process we ended up with the Grand Canyon.⁵

Edwin D. McKee proposed, after a consensus taken at a symposium headed by him, that the early Colorado River flowed into the Gulf of Mexico along a path that began east of the Kaibab Plateau continuing along the valley of the Little Colorado River that finally flowed into the Rio Grande. During the next eight million years, the Colorado Plateau rose up and some streams flowed to the west of the plateau. One stream eroded 300 miles northward from the Gulf of California then turned for 130 miles eastward through the Kaibab Plateau. This stream eventually “captured” the waters of the Colorado River, which changed course and began flowing to the west, where it eroded the Grand Canyon.⁶

In 1976 Charles B. Hunt stated that the Grand Canyon was carved in segments. First, the eastern part was partially carved by the land rising as the river ran down through it and by superposition. The river ponded in large basins to the north of Kingman, Arizona, and that lake tunneled northward through caverns and limestone deposits until it exited as a spring feeding another lake just beyond the western end of the Grand Canyon. This explains how and where the Hualapai Limestone accumu-

¹ The length, 216 miles, of the Grand Canyon should not be confused with the combined length, 277 miles, of the Grand Canyon and Marble Canyon. Both are located in Grand Canyon National Park.

² Powell JW (1875) *The Exploration of the Colorado River and Its Canyons*, Reprinted: (1987) Viking Penguin, New York, NY, 89–90

³ Breed CS (1969) A Century of Conjecture on the Colorado River in Grand Canyon, *Four Corners Geological Society Guidebook*, Museum of Northern Arizona, Flagstaff, AZ, 63

⁴ Emmons SF, (1897) The Origin of Green River, *Science* 6:19-21

⁵ Blackwelder E (1934) Origin of the Colorado River, *Bulletin of the Geological Society of America* 45:551-566

⁶ McKee ED, Wilson RF, Breed WJ, Breed DS (1964) Evolution of the Colorado River in Arizona—A hypothesis Developed at the Symposium on Cenozoic Geology of the Colorado Plateau in Arizona, Mus. Northern Arizona Bull 44

lated. When the flow from east of the Grand Canyon increased, the lakes overflowed cutting the western Grand Canyon. Over the next few million years the Colorado River cut the canyon down to what we observe today.⁷

Ivo Lucchitta concluded in 1988 that the early Colorado River flowed southwest across a flatter Kaibab Plateau cutting down through it by superposition. West of that plateau the river flowed to the northwest but faulting and volcanism have since erased that path. About 5 million years ago, a stream began flowing south into the newly opened Gulf of California. That stream eroded upstream along what is now the Colorado River's path after it leaves the Grand Canyon. Further upstream erosion to the east caused the stream to intersect and "capture" west of the Kaibab Plateau, the Colorado River, which then carved out the Grand Canyon.^{8, 9}

In 2000, Norman Meek and John Douglass collaborated on their theory of how this happened. They say that about 6 million years ago the Colorado River drained into Hopi Lake. Eventually the lake breached, spilling over the Kaibab Plateau to the west. The released water filled other basins downstream forming lakes that then breached successively. The region west of the Grand Canyon may have subsided by almost one mile, and the Colorado Plateau may have tipped to the southwest, giving the waters from the upper Colorado River enough energy to carve out the Grand Canyon as we now know it.¹⁰

All these previous theories have serious problems with certain physical evidence as can be observed today. None answer the question of how the layers formed without any sign of erosion between the layers of sediment. The formation of the limestone cannot be explained by these proposals. Neither can these proposals explain why the canyon was formed at its present location since there are lower points the water should have gone. The barbed or slot canyons cannot be explained by any of the previous theories. Previous theories also cannot explain the distant cavern connection, unusual erosion, the Nankoweap Canyon, fossils of sea creatures, or the tipped layers below the Great Unconformity. These theories leave many unanswered questions and have little or no explanatory value to what we observe.

As should be obvious by reviewing them, these theories are promoted by evolutionary thinking requiring millions of years for the canyon to form. An alternate theory would be the recent formation of the canyon by forces possibly catastrophic in nature that may not be observed on an every day basis. Creationists believe that the formation of the Grand Canyon is related to the global Flood of Noah. While the receding waters of the Flood may have created the canyon, if that were the case, there should be other canyons with similar characteristics all around the

world. The canyon was formed from the aftermath of geological events immediately following the Flood.

Everyone agrees that water carved the Grand Canyon, but there would be no Grand Canyon if it were not sitting on a mile-high plateau. Water draining from a swimming pool or continent does not achieve high, erosive velocities interior to the pool or continent; such velocities only occur on the downstream edge of the pool or continent. Water is about a hundred times more viscous, resistant to flow, than air; water cutting through air and spilling onto dry land would obtain higher velocities than water trying to cut through water. The result would be erosive sheet flow. If the flood waters had already drained away, the erosive energy would be much greater.¹¹

In 1989, Walt Brown, submitted his Hydroplate Theory, which included insight into the formation of the Grand Canyon. According to Dr. Brown, sediments produced during the flood phase settled through the flood waters grain by grain. Liquefaction sorted those sediments into layers totaling, on average, about a mile in thickness. Approximately 20% of the flood water was trapped between those grains at the end of the flood. As that subsurface water escaped during the following years, much of today's terrain was sculptured.¹²

Brown also postulated that near the end of the flood, huge continent-size hydroplates, that were lubricated below by water, accelerated downhill, away from the rising Mid-Atlantic Ridge and Atlantic floor and toward the sinking Pacific plate. In just hours, the hydroplates met resistance and crashed. This compression event crushed, thickened, and buckled the hydroplates, causing a pushing up of earth's major mountain ranges.¹³

Brown states:

A series of major events then occurred which produced the Grand Canyon.

1. The flood's surface waters drained, leaving behind post-flood lakes in every continental basin.
2. The Rocky Mountains partially sank into the mantle. As they did, they hydraulically lifted the Colorado Plateau an average of 6,200 feet. Carried on top were two large lakes: Grand Lake and Hopi Lake.
3. Later, Grand Lake breached its southwest boundary, causing Hopi Lake to also breach. Escaping waters spilled off the western edge of the Colorado Plateau, first stripping off the soft Mesozoic sediments south and west of the lakes (the Great Denudation), then carving the Grand Canyon in weeks. Thus, the Colorado River was born—a consequence, not the cause, of the carving of the Grand Canyon.¹⁴

A similar theory was proposed by Steven Austin in 1994.¹⁵ According to Austin's Dam-Breach Model, the mechanism

⁷ Hunt CB (1976) Grand Canyon and the Colorado River, Their Geologic History, *Geology of the Grand Canyon*, Grand Canyon Natural History Association, Flagstaff, AZ, 129-141

⁸ Lucchitta I (1988) *Canyon Maker: A Geological History of the Colorado River*, Museum of Northern Arizona, Flagstaff, AZ

⁹ Lucchitta I (2003) *History of the Grand Canyon and of the Colorado River in Arizona*, Oxford University Press, New York, NY, 260-274

¹⁰ Meek N, Douglass J (2001) Lake Overflow: An Alternative Hypothesis for Grand Canyon Incision and Development of the Colorado River, *Colorado River: Origin and Evolution*, eds. Young RA, Spamer EE, Grand Canyon Association Monograph 12:199-204

¹¹ Brown W (2008) *In the Beginning: Compelling Evidence for Creation and the Flood*, 8th edition, Center for Scientific Creation, Phoenix, AZ, 199

¹² *Ibid.*, 189-190

¹³ *Ibid.*, 105-141, 169-181

¹⁴ *Ibid.*, 190

¹⁵ Austin SA (1994) How was Grand Canyon eroded?, *Grand Canyon - Monument to Catastrophism*, Institute for Creation Research, Dallas, TX, 83-110

for the formation of the Grand Canyon can be broken down into three stages:

1. Within a few centuries of the flood, sediments damming Lake Hopi were breached by piping.¹⁶ He proposed that a tunnel was initially formed by piping, and was rapidly enlarged by the high-pressure flow of water before the roof collapsed, forming a channel. Erosion would have been aided by cavitation,¹⁷ multiplying the erosive strength of the water, grinding large sections of rock from the channel floor. Once the tunnel collapsed, cavitation would cease, since it only takes place in shallow, very fast currents. This dam failure was a catastrophic emptying of the lake cutting the drainage of the Little Colorado River.

2. Immediately after the draining of Lake Hopi, "Canyonlands Lake" suffered a similar catastrophic fate cutting through the Vermillion-Echo Cliffs. Piping was also probably involved at this time. This event cut Marble Canyon and extended the Grand Canyon north and northeast from the Kaibab Plateau.

3. Like a great movie thriller the action kept coming as "Vernal Lake" breached also cutting through the Roan and Book Cliffs. The combined water from these three lakes flowed west, eroding the Grand Canyon and probably the Canyonlands area of southeast Utah, Black Canyon on the Gunnison River in western Colorado, and Flaming Gorge in Utah and Wyoming. The volume of water needed to erode the Grand Canyon demands the simultaneous emptying of all three lakes.¹⁸

Tas Walker in 1994 proposed that the retreating stage of the Flood included two phases. First an initial sheet flow phase and a later channelized-flow stage. This two stage sequence of events can explain the features of the Colorado Plateau, including the Grand Canyon, and can make sense of field data that other models cannot explain. The secret to understanding landforms¹⁹ is the realization that each of these two distinct phases of the Floodwater retreat had its own distinct and identifiable erosional patterns and that the channelized-flow patterns are superimposed on top of features created by the sheet-flow phase.²⁰

¹⁶ "Piping" is an engineering term that describes the forcing of water through weak areas in a dam because of the higher water pressure behind the dam.

¹⁷ "Cavitation" is caused by the implosion of "bubbles" or vacuum cavities formed by irregularities in a channel during extremely high flows.

¹⁸ Oard MJ (2010) The origin of the Grand Canyon Part II: Fatal problems with the dam-breach hypothesis, *Creation Research Society Quarterly* 46(4):292

¹⁹ Landforms are features that when taken together make up the surface of the Earth. They include the broad features such as mountain ranges, plateaus, and plains, as well as small-scale features such as hills, valleys, slopes, canyons, and alluvial fans.

²⁰ Oard MJ (2010) The origin of the Grand Canyon Part III: A geomorphological problem, *Creation Research Society Quarterly* 47(1):46

It could be as Michael Oard suggests, that the Grand Canyon is just another "water gap",²¹ albeit, the longest one in the world. In that case, the Grand Canyon is not unique; it is one of a class of landforms found worldwide. It is similar to other water gaps located on the Colorado Plateau and other places around the world. Water gaps as a whole are easily explained by the runoff of the Floodwater from the continents.²²

Creationists have good, scientifically sound answers to how the Grand Canyon was formed. If it is a water gap, it is not unique as a landform as there are more than a 1000 documented water gaps world-wide. Geomorphologists,²³ using evolutionary thinking with millions of years, cannot credibly explain the canyon or other water gaps because their uniformitarian paradigm forces them toward low-energy, long time frame explanations usually involving the rivers currently flowing through them. Taking the Flood into account allows us to examine the water gaps independent of the rivers presently flowing through them. Also, the two stage retreat of the Flood's water off the continents provides an answer and a mechanism for both the Great Denudation and the Colorado Plateau and the erosion of Grand Canyon and its tributaries, along with other water gaps scattered across the Plateau. The relative youth of the Grand Canyon and other water gaps seem to support the late-Flood interpretation, and the existence of so many water gaps with vertical walls suggests that uniformitarian dating for these features are far too old.²⁴ ❧

COMING EVENTS

Thursday, February 10, 7:00 P.M., Providence Baptist Church, 6339 Glenwood Ave., Raleigh, Room 631

Everett Coates will present "Mount St. Helens, the Volcano that Challenged Deep Time." "Deep time" is the presupposition held by most scientists that billions of years of earth history are a reality. That much time is necessary for the notion of evolution to have any credibility at all. The uniformitarian argument ("the present is the key to the past") of evolutionary geologists against the global Flood of Genesis is based on 1) the observation that the current rate of sediment deposition on the ocean floors is very slow and 2) the assumption that the process (and no others) has always operated at the same rate. Thus, hundreds of millions of years are necessary to account for the sedimentary rock layers that are seen around the world, which in some places are miles thick.

²¹ A water gap is defined as a "deep pass in a mountain ridge, through which a stream flows. This is especially true for a narrow gorge or ravine cut through resistant rocks by an antecedent or superposed stream." A water gap refers to a gorge through any structural barrier. These cuts are also called transverse drainage, which would include a plateau, a series of plateaus, and even an isolated mountain. Neuendorf KKE, Mehl, Jr JP, Jackson JA. (2005) *Glossary of Geology*, 5th Edition. American Geological Institute, Alexandria, VA

²² Oard MJ (2010) 47

²³ Geomorphology is the geological science that studies the general configuration of the Earth's surface, especially the classification, description, nature, and origin of landforms and their relationships to the underlying geological structures. The uniformitarian study of the geomorphology of the Grand Canyon has not provided a solution to its origin.

²⁴ Oard MJ (2010) 56

The series of eruptions of Mount St. Helens that began on May 18, 1980 were the most scientifically documented explosive volcanic event in history to that date. The geologic and geomorphic structures that were produced in a matter of hours or days during and soon after the eruptions could not be distinguished from those in other places that were assumed to have taken hundreds of millions of years to form, bringing into question the idea of deep time.

Likewise, the rapid pace of ecological recovery after the eruptions proved false the “slow and gradual” assumptions of evolutionary biologists, which had allowed them to ridicule the biblical account of a catastrophic, global flood that in about one year destroyed almost all living organisms on the earth followed by a quick recovery of plant, animal and human life.

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