

GRAND CANYON Monument to Catastrophe

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This is an undergraduate level book written in non-technical language. The photographs and diagrams are excellent, but cannot be reproduced here. You need a map (preferably detailed) of Arizona!

Huge

Grand Canyon stretches for 277 miles, is more than a mile deep and 4-18 miles wide. The northern rim is higher than the southern rim. How did it come to exist? Evolutionists think that it took a billion years in the making. Creationists believe that it was carved out by a global flood a few thousand years ago. Who's right?

Evolutionary Interpretation of the data*

Two of the earliest geologists to study the canyon disagreed about its cause. One thought that a flood had carved it out of the earth: the other didn't. *An interpretation is not an observation!* The fact is that *we view the data in terms of an interpretative framework.* The interpretation is therefore only as good as the premises we start with.

Historical significance

Geologists usually believe that the strata have an historical significance, i.e. it represents historical processes at work over a vast period of time.

Uniformitarian

The second generally held premise is that the processes which shaped the canyon are the processes we see at work today.

Sedimentary processes

The third premise is that the sedimentary processes which formed the strata operated at the same rates as similar processes today.

Creationist Interpretation

Creationists assume that a gigantic catastrophe, the global flood of Genesis 6-8, was responsible for shaping Grand Canyon. It is true that some Christian geologists disagree. The reason is that they do not think that Genesis 6-8 provides historical data.

Whatever our presuppositions, they will determine our interpretation.

Principles of Interpretation

Superposition

If the strata have not been disturbed, the oldest

strata will be at the bottom, the latest at the top.

Original horizontality

When deposited the strata were horizontal or virtually so.

Original continuity

The strata were originally horizontal in all directions until they either thinned out or were blocked.

Cross-cutting

Any feature which breaks the continuity of the structure or cross-cuts it must have come later.

Analogies today

Geologists prefer explanations of the origins of strata that are consistent with what we see today.

Current processes?

Shallow-water lime-muds currently forms at one foot thickness per 1000 years. Did the Redwall Cliffs of the Canyon form over millions of years? Evolutionists say they did. But creationists point out that there are textural, mineralogical and chemical differences between modern lime-muds and ancient limestones. Are we comparing like with like?

Rapid deposition

It is true that many modern limestone mud deposits are forming slowly, but there are examples of very rapid formations in the Florida-Bahama area. The remarkable Santana Formation of northeast Brazil is very fine limestone—with beautiful fossils, whose lithification was evidently instantaneous! Obviously catastrophic processes were at work there.

Fossil reefs?

Creationists argue that the Canyon was formed suddenly and catastrophically. Evolutionists say that the limestone 'reefs' in the Redwall Limestone were constructed *organically* over periods of time. But the most extensive (non-creationist) study of the cliffs finds little evidence of an organic origin (p26).

Rapid deposition of limestone

In 1966 numerous fossils of *nautiloids* were found in the Redwall Limestone. These are cigar-shaped shells, once occupied by relative of the squid. (Their modern cousin, the *nautilus*, lives in the Indian Ocean.) Remarkably these fossils are all aligned in roughly the same direction! This suggests that they were buried, not over millions of years, but suddenly in swiftly moving water! If so the limestone was deposited quickly.

* Digest of chapter 3. This is an excellent, very thoughtful book. Do please obtain it from AiG—See link.

Grand Canyon Chapter 3: Interpreting the Strata

Sandstones of Grand Canyon River Sand Deposits?

It is argued by evolutionists that the sedimentary strata of Grand Canyon were formed on the sea bottom. If so, the clay-mud and quartz sand would have been carried to the sea by a river and deposited in a delta. The entire deposit would be wedge-shaped in cross-section. The Supai Group of strata are superimposed on the Redwall Limestone and should give evidence of a delta, if the evolutionary theory is true. But two geologists—McKee and Blakey—who studied the Supai most extensively find no evidence of a delta! So how did they originate? Various theories are proposed, but there is no consensus.

Wind Deposits?

Some geologists think the sandstones may have been deposited by wind. The Coconino Sandstone may have originated in sand-dunes. There are fossilized tracks in the Coconino. Moreover it is argued that the pure quartz sand of these strata does not form in floods! So the Genesis Flood is dismissed.

Footprint Experiments

Dr Brand of Loma Linda University found in laboratory experiments that the fossilized tracks of the Coconino were probably made *under water*. Very likely the animals who made the tracks were moving up the slope, under water, *attempting to escape from it*. Dr Brand published his results in *Science News* and *Geology Today*.

Desert 'Dunes'?

Prof. Visher of Tulsa University (not a creationist) found that sand dunes may form *under water* and - contrary to evolutionary claims—with pure quartz sands! So a watery origin of the Canyon sandstones is by no means out of the question.

Sand-Wave Deposits

In a fairly technical section the authors, drawing on the research of J.R.L.Allen (*Physical Processes of Sedimentation* New York 1970), show that the structure of the Supai Sandstone is best explained in terms of under-water formation of dune-like 'sand-waves'. These were sometimes as high as 18 meters! They required very high velocity currents of water. The Genesis Flood seems the most probable explanation.

Where did the sand come from?

The Coconino Sandstone is part of a huge 'blanket' of limestone covering 200,000 square miles! This sand evidently came from the north, but the transportation of such a vast quantity needed a correspondingly huge amount of water. So we come back to the Genesis Flood.

Shales of the Grand Canyon

It is generally thought that the thin laminations of Grand Canyon Shale prove its slow deposition—layer upon layer—over millions of years.

However there is a evidence to show that this was not necessarily the case. At Mount St. Helens twenty-five feet of *laminated* ash fell in a few hours. And P.H.Kuenen showed in the *Journal of Geology* how high velocity currents are able to sort and deposit sediments in terms of their weight, density and shape. Millions of years are not necessary!

This digest only gives the reader a taste of a chapter, which discusses the issues at some length and has 121 references to the academic literature. But it should be sufficient to demonstrate that creationists' explanation of the Grand Canyon is worthy of serious consideration.

A CREATIONIST VIEW OF THE GRAND CANYON STRATA

Chapter 4 shows the 'inside story' of the ground under our feet and suggests a catastrophic interpretation of the strata.

Five Divisions of Grand Canyon Rocks

The authors here assume the historical reliability of the Bible.

1. *Oldest, most deeply buried rocks*

These are the Zoroaster Granite and the Vishnu Group, which are the bottom-most rocks in the Canyon. Creationists think these are the original rocks of the early earth.

2. *Oldest stratified rocks*

The Precambrian strata, deeply buried and tilted—the result of tectonic activity when God separated the waters from dry land.

3. *The Palaeozoic strata*

These are horizontal, 4,000 feet thick. They are the sediments deposited in the early part of the global flood of Genesis.

4. *The Mesozoic strata*

These represent erosion and deposition as flood-waters retreated in the later stages of the global flood.

5. *The youngest strata*

These include lake deposits, landslide deposits and lava flows of the post-Flood period.

Early Creation-Week Rocks

Zoroaster Granite

The authors suggest that the most deeply buried Zoroaster Granite existed from the very beginning of the earth. This is metamorphic rock, non-stratified, crystalline, rich in minerals. Possibly, it was injected as dikes ('tongues' of rock) into the Vishnu Schist as the continent was formed?

Nonconformity

A non-conformity exists where sedimentary strata lies on top of eroded metamorphic or igneous rocks. Immediately above the Vishnu and Zoroaster rocks lie the strata of the Unkar Group. The authors suggest that these strata were formed under water by erosion.

This is an excellent and attractively produced book. Do please read it. There are many diagrams and a glossary of terms—You can get it from AiG. See the link on this website.

Grand Canyon Chapter 4 A Creationist View of Grand Canyon

Creation Week and the Pre-Flood Strata

The Unkar Group of sedimentary rocks – consisting of various formations—which lie directly over the Zoroaster Granite and the Vishnu rocks—suggest that northern Arizona was originally an ocean bed. Austin goes into some detail here in arguing that here we have the base rocks of the earth.

Early Flood Strata

If Genesis represents real history, a fantastic global flood occurred not many thousand years ago. Is there any evidence to suggest that this is true? Well, Grand Canyon's characteristic horizontal sedimentary strata - 4000 feet thick - were apparently formed as huge flood-waters advanced into northern Arizona. Dr Austin's discussion is very detailed, but some of the evidence, which fits in with a Genesis-context, includes: *Tapeats Sandstone*, the upper beds of this rock, contain the tracks of trilobites, therefore Tapeats seems to be a marine sand-deposit; *Bright Angel Shale**, another early rock, has marine fossils—trilobites and brachiopods; *Redwall Limestone*, with its nautiloids (see above); the *Coconino Sandstone*—which was evidently deposited by water more than 100 feet deep; finally the *Kaibab Limestone*, approximately 250 feet thick, containing many marine fossils, and which to some extent—the stratas containing beds of quartz sand—must have been deposited by swift-flowing water. Dr Austin goes into considerable detail, supported by superb photography and diagrams.

Late Flood-Strata And Erosion Surfaces

Genesis says that after 150 days the Flood began to retreat. Dr Austin infers that erosion surfaces would form during this period through fast flowing increasingly shallow water. The top of the *Kaibab Limestone*, to the NE of Grand Canyon, displays a 'widespread erosion surface'. (Most visitors stand on this surface to view the Canyon.) The erosion was caused by retreating Flood-waters, which bevelled recently consolidated formations.

Post-Flood Deposits

These are volcanic strata, landslide deposits and river gravels. In the Western Grand Canyon lava flows spilled over the northern rim and descended in some cases to river-level. The resultant rock is black basalt. Incidentally a rubidium-strontium 'age' for these rocks proved to be 1.3 billion years—which is geologically absurd!

Grand Canyon Chapter 5 How was Grand Canyon Eroded?

Three Observations

1. Almost 1,000 cubic miles of sediment were removed from Northern Arizona to form the Canyon.
2. Grand Canyon cuts through a great plateau of land. A river would normally be expected to find a way *round* it.
3. Uplift of the Kaibab plateau evidently occurred *before* erosion of the Canyon took place.

Antecedent River Theory

Geologists like Wesley Powell thought the Canyon had formed through millions of years of erosion. Later geologists have supposed that the Colorado Plateau was uplifted about 70 million years ago. The river however was there first and the Canyon is enormously old. The plateau was uplifted as the river continued to form the Canyon.

Problems with this Theory

1. Erosion is not proceeding slowly but rapidly! From 1926-1950 erosion sediments amounted to 168 million tons per year. The Antecedent River Theory says that the river has been flowing for 70 million years! At current rates of erosion that would produce an amount of sediment 1,500 times the volume of Grand Canyon!
2. Now this stuff must have been deposited somewhere. So where is it? Studies of the Colorado Rive delta have failed to find anywhere near this amount.
3. Could the Upper Colorado Rive have been eroding the Canyon for 70 million years? If a constant rate of erosion were assumed, the depth of the Canyon would be 7.3 miles!! But it isn't.
4. On the other hand how long would it take for 1000 cubic miles of materials to erode at present rates of erosion? The answer is, 67,000 years. But given the erosion rate of the flood in 1927 the answer would be 1,300 years. Creationist-geologists believe that the Genesis Flood was many time greater than that in 1927.

Precocious Gully Theory

1. The Antecedent River Theory died the death and in then another theory was proposed. This time it was suggested that Grand Canyon was formed rapidly by 'enlarged gully erosion'.
2. The Upper Colorado River has always flowed south. It used then to flow eastward. Westward flowing draining made a 'gully' to the west, and later extended itself *eastwards* and 'captured' the Colorado River!

*Please see THE GEOLOGY BOOK on this website for definitions.

Grand Canyon

How was it formed?

Problems with this Idea

1. How could the gully cut eastwards to cut through the Kaibab plateau? This would be remarkable!
2. Radioisotope ages are a continuing puzzle for geologists, for they do not fit the evidence. The potassium-argon method of dating, for instance, have give results which imply that the Canyon was formed very rapidly. This contradicts the uniformitarian theory.

The Breached Dam

1. Amazingly the idea of a catastrophic origin of the Canyon is preserved in the legends of the Havasupai Indians! The Canyon was formed after a universal flood.
2. It is proposed that a huge lake once covered large parts of Arizona, Colorado, New Mexico and Utah. It was 30,000 square miles in area and contained 3,000 cubic miles of water. The dam was breached and the Canyon was formed by the out-flowing waters.
3. Breached dams are not unknown. In Washington, Idaho and Montana a huge prehistoric lake breached its ice dam and formed the 'scabland' in eastern Washington. Incidentally the man who figured that out had a tough time explaining it to his colleagues, though eventually they agreed with him!
4. Is there any evidence for a breached dam in the case of Grand Canyon? [a] You would expect to find evidence of the ancient lake mentioned under (2) above. Unusual sedimentary deposits include fossils of freshwater fish. [b] There is evidence that drainage—which at present is generally sluggish—has probably been much rapid in the past. 'Incised meanders', where the river bends sharply and deeply, must have been caused by huge amounts of water. [c]