

Book Review
Grand Canyon: Monument
To Catastrophe
Chapter 3 – Interpreting Strata of Grand
Canyon
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The authors give a brief description of the interpretive framework one uses to interpret the strata of the canyon. The first misleading statement made is in the constant use of the term "evolutionist." The authors assume they are arguing against the evolutionists only, however, most Christians who believe in an old earth are not evolutionists. So, from this point on, assume that the term "evolutionist" is used generally to apply to anyone believing in an old earth.

Page 22 gives a statement claiming that evolutionists frequently make the uniformitarian assumption that strata of the Grand Canyon formed during long ages as oceans slowly advanced and retreated over North America over millions of years. Yes, this is the conclusion of geologists, but it is not an assumption...it is based on the evidence. Using scientific principles, the scientist looks at the data, and then formulates conclusions. This is what the geologist has done. However, the young-earth theorist is the one who is guilty of making assumptions. The young-earth person has already "assumed" a young age of the earth, and then examines the data to try and justify it.

Figure 3.2 shows how they propose the two opposing theories of the Grand Canyon emerged...because of the framework of the person examining the data. The Creationist conclusion is absolutely correct...based on their assumption that the earth is 6,000 years old, they must interpret the data as meaning "young." However, the "evolutionist" model is wrong. As a Christian, I've examined the data, along with many other Christians, and we have determined, OUTSIDE of an evolutionary framework, that the earth is old, merely on the basis of data alone.

On page 23, the authors give the example of a Christian geologist, Davis A. Young, and the authors try to point out his narrow-mindedness in not considering both young and old options. They claim "it is imperative" that we examine both uniformitarian and catastrophic frameworks for the Grand Canyon. Why should we examine the evidence based on the "assumption" that the earth is young? Even so, I and many others have done so, and the evidence for an old earth is overwhelming.

Principles for Interpreting Strata (Page 23)

The authors give a good explanation in this section.

Limestones of Grand Canyon

Lime Mud Layers/Rapid Deposition of Lime Mud (Pages 24-25)

The authors bring up some good points about the composition of the limestone. Obviously some questions remain. The authors then use a common argument that is often seen in young-earth literature. They claim that some modern examples of rapid lime deposition occur during hurricanes in the Florida and Bahama areas. They use this "small" example of deposition to prove that it doesn't take millions of years to deposit a limestone. The simple argument here is that if the young-earth theorist can prove it on a small scale, then it is believable on a larger scale. Unfortunately, just because it can be proved on a small scale (several feet of sediment, over a few square miles) does not mean that it's workable on a large scale (hundreds of feet thick, over thousands of square miles). The authors make the statement "Clearly, catastrophic processes are needed to make these fine-grained limestones." No, they are not...we can see fine-grained limestones being produced today, at a very slow rate. I could argue based on this that it takes a long time to produce fine-grained limestones.

Fossil Reefs (Page 26)

The authors make the argument that since there are no large reef structures in the limestones of the Grand Canyon, then there was not much time for these organisms to grow and die before being buried. Since coral reefs take many years to form, the existence of a large reef structure in the Grand Canyon would prove that the limestones there formed over many years, and not during the flood of Noah.

No problem...however, if there are ANY large fossil reef structures in any rock strata anywhere in the world, then there would be definite proof of an old earth. Consider the Coral Caverns of Pennsylvania, where a fossilized coral reef can be seen in the walls of these caverns. Even more conclusive is the reef exposed at Falls of the Ohio State Park. This 387 million year old reef stretched for 1,000 miles, and could not have formed in only weeks, as the Flood requires.

Rapid Deposition of Limestone and Source of Lime Sediment (Pages 26-28)

The authors tell about the excellent nautiloid fossils from the Redwall Limestone. While not a major problem, there is some data missing. Concerning the orientation (Fig 3.6) of the fossils, they fail to state which end of the fossil is pointing towards the Northwest. Given the conical shape shown in Figure 3.5, and the argument on the following page about the current coming from the Northwest, we would expect the slender, pointed end to be towards the northwest. However, all we are told is that the long axis is aligned northwest to southeast. Second, a small depression, or incline, could cause these fossils to be oriented in the same direction. Thus, they may not be related to current at all.

Of more importance, however, is the theory of fossil randomization. Using a Flood model, as all the organisms died, they would be deposited in the strata. We should see a completely random fossil record, with nautiloids and other animals mixed throughout the

rocks. The most animals would be in the lower levels of rock, as most would have died early, especially the land, air-breathing vertebrates.

Using this model, we should see these nautiloids in other Grand Canyon layers...but we do not see these straight shell nautiloids anywhere else in the canyon layers. Furthermore, the land, air-breathing animals would have died first...so why are they deposited in the layers of rock that are ABOVE the Redwall Limestone? By the Flood model, they were the first to die, and should be the first in the fossil record. Using this test alone is enough to disprove the young age of the earth.

Sandstones of Grand Canyon

River Sand Deposits? (Page 28)

The authors make some valid points about the lack of deltaic structures in the Supai Group. They state the doubts of geologists as to the deltaic origin. However, they fail to mention one thing about this group...the conglomerates. A conglomerate consists of coarse, rounded rock fragments (greater than 2mm in diameter), held together by a matrix of sand, clay, and cement. They mostly form in alluvial fans, river channels, and beaches. Conglomerates do not form in a deep-marine environment. Figure 3.7 shows conglomerates at the base and within the Watahomigi Formation, and at the base of the Esplanade Sandstone. The mere existence of these conglomerates is proof that near-terrestrial water deposition caused them, not a "deep" ocean flood environment. Given the various levels of the conglomerates, it is evidence of the advancing and retreating of the ocean/land horizon.

They go on to state that geologists are divided on the origin of these sandstones? This division represents science at work, as we try to understand this formation. However, it does not imply a young earth...it only implies we don't have the whole picture. As I've stated earlier, young-earth theorists make a big deal out of geologists disagreeing with each other. This is because they cannot come up with a plausible explanation themselves that will fit a young earth model, so their only recourse is to cast doubt on the old-earth models.

Wind Deposits (Page 29)

In this section, the Coconino Sandstone is considered. Here is the problem...you can't have a water deposited formation on top and below the desert, wind-blown sands of the Coconino. This would imply desert conditions right in the middle of Noah's Flood. This must be explained away by the young-earth theorists, and they tried to do so, but failed miserably (<http://www.answersincreation.org/coconino.htm>).

The authors state that on first glance, this wind-blown interpretation would be an embarrassment to young-earth believers. They are right. But on second, third, and all subsequent "glances" the conclusions do not change. The Coconino is definitely wind-blown. Even if they could prove it otherwise, an even larger problem exists, and that is the Navajo Sandstone, another, larger wind-blown formation stretching from Utah to Northern Arizona (<http://www.answersincreation.org/desertproblem.htm>).

Footprint Experiments (Page 31)

The authors claim that footprint experiments, conducted by Dr. Leonard Brand, conclusively prove that the Coconino footprints were made underwater. While apparently conclusive, there is one major hole in this theory.

In order to have a fossil footprint in the first place, you must have two distinct layers...the one that the footprint impression is in, and the one overlying the impression. Consider a dry, desert environment. If a creature made a footprint, and it was immediately covered over with dry sand, you have dry sand, covered by dry sand. This does not produce the two distinct layers, and the dry sand would appear as one indistinguishable unit. Therefore, in a situation where both layers are dry, you get no footprints.

Now, let's consider the underwater, catastrophic model. You have a constant influx of sediment. The animal makes the impression in wet sediment, which is then immediately filled by more wet sediment. Again, with this wet on top of wet environment, you do not have distinguishable layers to give you the footprints. In a mudstone/silt environment, you could get footprints in a wet-on-wet condition, but not with pure sand.

The only way to get these footprints is in a desert, sand dune environment. How? The animals would have to be walking after a rain event (or period of near 100% humidity), and would be making these impressions on wet sand. Then, after the rainstorm, the footprints were covered over with dry sand. This gives two distinct layers.

His experiment is flawed on another point. He has to make a huge assumption that the tracks were made by a newt-like animal. In fact, we have no clue what kind of animal made these tracks, so any study based on any animal type would be flawed.

Desert "Dunes?" (Page 32)

After reading this section, I was smiling with joy! I'm going to cut to the chase...the authors use a grain size plot to show that the grains in a desert sand dune plot in a straight line, and the sands in the Coconino Sandstone are more random, and they use this argument as proof that the Coconino is water deposited.

Remember, any dry, desert sandstone would disprove the Flood of Noah as having deposited all the rock layers. If you have a dry sand layer, and water deposited layers on top, then you have a dry period right in the middle of Noah's Flood!

If you have the book, look at the column right above Figure 3.10 on page 32. The first sentence in the first paragraph states that the geologist making this plot in the figure obtained four samples. Where did the desert sand dune samples come from? The reference given for this sentence, number 44, at the end of the chapter, identifies the source. The source of the desert sand dune sample is "Stratigraphic Analysis of the Navajo Sandstone!!!" Its amazing...the authors are actually admitting that the Navajo Sandstone, formed by wind-blown sand, is a desert formation! A quick look at the stratigraphic column above the Navajo, shows thousands of feet of sediment on top of it, including other dunes, floodplains, and beach environments of the Jurassic period. This INCLUDES the Morrison formation, which is the source of massive numbers of dinosaur fossils. How could these dinosaurs be killed during Noah's flood, AFTER the formations of the Grand Canyon were deposited, and more importantly, AFTER the wind-blown

desert formation known as Navajo was created (by young-earth models, during the flood). This is totally inconsistent with the flood model proposed by young-earth theorists...and they inadvertently destroy their own theory in this section of the book!

Based on this, you can skip the rest of the discussion on the Coconino...it doesn't matter since we have the wind-blown Navajo Sandstone! (see also <http://www.answersincreation.org/desertproblem.htm>)

Shales of Grand Canyon

Thin Laminae (Page 37).

In this section, the authors try to disprove the varve theory. They give modern examples of thinly-laminated sediment forming in a rapid fashion. First, you can completely ignore the part about Mt. St. Helen's ash layers. Deposits of airborne ash have no correlation to deposits of water-deposited clay. Second, the Hurricane they mention created a whopping six inches of laminated mud! This in no way proves a hundred's of foot thick shale of the Grand Canyon was caused by the flood. After all, a hurricane, moving over a spot where the clay formed, lasted 12 hours at best. However, not only does Noah's Flood have to produce the finely laminated shale, it must also produce limestone and sandstone, in alternating orders...it can't do this. At a clay accumulation rate, at best, using the hurricane model, of 1 foot per day, and the flood lasting 370+ days, you can see the obvious problem! At most you have 370 feet of sediment, but the Grand Canyon is over 5,000 feet thick.

Third, they give the example of a lake in Switzerland, which forms five laminae pairs per year. Great! So now, the four million laminae of the Green River Formation in Wyoming can be formed in 800,000 years, still much too old to fit the young earth model. Again, this has no relevance to the Grand Canyon.

Fourth, they give the example of the laboratory test on page 38. Unfortunately, shale in the natural world does not form in a test tube. This test proves that the hurricane can produce the lamination, but in a lacustrine environment, proves nothing. The amount of sediment available in the lake environment per square inch is vastly less than that used in the lab experiment. The experiment does lend credibility to the hurricane deposition, but has no bearing on the Green River Formation.

Concerning the experiment on page 39 by Buchheim and Biaggi, their methods are flawed. They incorrectly assumed that the deposition rate of the entire basin is the same throughout the basin! Obviously, the deposition rate would be greatest as you went from the middle of the basin towards the shoreline, which is the source of new material being washed into the basin. The fact that the number of laminae increased by 35 percent, from the middle of the basin towards the edges, is perfectly consistent with the geologic model (see <http://www.answersincreation.org/varves.htm>). The authors also point out that kerogen content decreased as you move from the center outward. This is also consistent with a slowly depositing shale. At the edges, the ratio of silt to biologic material is greater, because of the influx of silt from the edges. You would expect to get a higher ratio of kerogen as you moved away from shore.

This section has proved that annual varves may not be annual, but they provide no proof for a global, one-year flood model.

Burrows of Organisms (Page 39)

Here the authors make some valid points. Their "alternate interpretation" referred to in the last paragraph has one apparent flaw. Let's suppose that these were escape burrows, caused by animals which were trying to escape rapid burial. Remember, the young-earth creationist claims you need rapid burial in order to fossilize an animal. If this is the case, then...where are the animal remains? Some would have escaped, to be sure, but some would not have. This would have been perfect conditions to promote fossilization, so we should have them there, but they are not...we only have burrows.

Shrinkage Cracks (Page 40)

In this section the authors try to explain away the existence of shrinkage cracks, or mud cracks, a common feature seen in dry environments. These would indicate a period of dryness in the middle of Noah's Flood. In the opening section, the authors mention they are abundant in the Grand Canyon, occurring in the Hakatai Shale, the Supai Group, and the Hermit Shale.

They use the argument that some of the shrinkage cracks in the Hermit Shale appear to be syneresis cracks, or, they occurred in underwater conditions, not dry, hot environments. Yes, it is clear that these cracks do appear to be created this way, apparently giving weight to the young-earth model.

But, wait a minute! They argue this for the Hermit Shale...what about the Hakatai and Supai? No argument is made concerning these! IF these were also apparently syneresis cracks, there would be no doubt that they would tell us this...but they do not. They hope that the reader will be convinced that these shrinkage cracks present no problem to a young earth, based on the limited evidence given refuting some of the cracks in the Hermit. Their silence on this issue is proof of the other cracks as being standard, dry-environment mud cracks, which don't fit into the flood model!

Long Ages Between Strata?

The authors explain unconformities in this section, and attempt to explain them away in the following sections.

The Great Unconformity (Page 45)

First, the authors present some weak points about weathering. Then, they go on to totally confuse the reader! They claim there is evidences for catastrophic erosion can be seen in the large boulders of Shimuno Quartzite (Figure 3.23). While interesting, this photo is far from clear. About 3/4 inch down from the top of the photo, and 2.5 inches from the left, one can see a folded stratum. The picture appears to be a slightly metamorphosed rock layer, with blocks of sediment (not boulders) differentiated from the pressure. Part of their argument is that significant erosion can occur from bedrock over a short period of time. If so, we should see rounded boulders...however, the so-called boulders in the picture are all angular. It is apparent that the picture does not represent a

flood event, but a metamorphic event. The entire Flood interpretation of the Great Unconformity appears to rest with these so-called boulders.

At this point, let's talk about the Shimonio Quartzite. What is Quartzite? It is sandstone that has been put under pressure, to a slight degree, and the sand particles fuse together forming a more solid rock. It is apparent these rocks were pressurized, especially since you can see the folding. Thus, you can ignore the previous discussions in this section...they don't matter. Angular blocks...not boulders!

Take a note of Figure 3.22. I've shown in other articles, that young-earth theorists think geologists date rocks based on how old it looks. In this figure, they are guilty of what they accuse geologists of!

In conclusion, there is absolutely no evidence that would cause one to doubt this unconformity as being millions of years in duration.

The Kaibab-Toroweap Boundary (Page 47)

There is evidence in geologic circles that this unconformity is being challenged. As such, we will leave it alone.

The Supai-Redwall Boundary (Page 48)

This is a very weak section for the authors. They offer no conclusive proof, only a weak argument about the karst features forming after deposition of the overlying sediment (without anything supporting this theory). Their admission at the end, "This is a topic worthy of further study" is an admission that they are weak in rebutting the old ages implied by this boundary. This is a common "cop-out" used by young earth theorists when they can't explain away the old age of the earth.

Indeed, I was quite surprised at the weakness of their explanation. Their final two conclusion paragraphs present very weak arguments, yet they come to the conclusion in the last sentence that "extensive pre-Supai solution is doubtful." The only way to reach this conclusion from this section is to "presuppose" the age of the earth is only 6,000 years, and if you don't understand it, then say "it needs further study." In other words, ignore the evidence.

The Coconino-Hermit Contact (Page 49)

The Hermit-Esplanade Contact (Page 50)

Let's consider these two together as a unit. First, the Coconino gives good evidence of this paraconformity. While it is surprising that the authors give so little evidence against this being "old," it is not surprising considering the evidence for it.

Consider the context of the young-earth argument. They focus in on the paraconformity at one location, along the Bright Angel Trail, and claim there is no channel erosion, residual soil, or weathering features that can be distinguished. From this, they then "assume" (and hope the reader will too) that this is true throughout the contact. Is this true? I don't know, since I don't have access to any documentation about it. However, no statements are made about the "entire" contact...only about this one small section of it. Great...they have proved there are none of these features in this

roughly 300 foot long exposure of this contact. However, I realize that my argument is not conclusive, either. So consider the following paragraph's evidence.

There is a beautiful picture of this Coconino-Hermit contact in Figure 3.25, and of the Hermit-Esplanade Contact in Figure 3.26. You can easily see the sharp contrast between the Coconino and the Hermit. Looking at the Hermit-Esplanade photo, you can't see this. That is because, as the authors note in the caption, of the intertonguing change in the grain size of sediment. In plain language, as the sediments change type, from shale to limestone, there is a gradual change, with thin layers of limestone and shale together, alternating as the environment changed. The authors use this evidence of a gradual change as evidence against an unconformity in this location. OK, the evidence for the Hermit-Esplanade unconformity is doubtful.

However, let's apply this logic to Figure 3.25, and the Coconino-Hermit contact. If this is not a paraconformity, there should be evidence of this "intertonguing." There is NONE. Thus, using the young-earth argument against the Hermit-Esplanade contact, you in essence prove the paraconformity of the Coconino-Hermit!

Summary

There are too many false conclusions here to mention, based on the false arguments of this chapter. In short, in the opening paragraph, the authors claim that evolutionists (i.e. old-earth creationists included) presuppose that sedimentation occurred slowly. NO...old-earth proponents determined this from the evidence, and did not presuppose anything. The authors state that catastrophic flood appears to explain the most common Grand Canyon strata. NO...the weak arguments of this chapter are full of holes. The authors claim that long ages occurring between some strata (unconformities) are doubtful...NO, some are doubtful, while others are conclusively long periods of time.

Section five of their generalizations is enough alone to argue against the flood model. See my rebuttal of the Coconino Sandstone (<http://www.answersincreation.org/coconino.htm>).

Section seven states "Catastrophic geology is alive and well in Grand Canyon." Nothing could be farther from the truth.

The main tactic of the authors in this section has been to draw extracts out of geologists writings that offer differences of opinion between them, and use these to cast a shadow of doubt upon the old ages of the rocks. Instead of disproving the old age of the earth, they have merely pointed the great process that is at work in the field of geology. Through competing research, we are coming to a better understanding of the processes that shaped the earth. We are not, however, disproving the old age of the earth by these disagreements. Except for the young-earth creationists, these scientists that they pit against each other all claim the overwhelming evidence supports the old age of the earth. There is no doubt about this in geologic circles.