Paul Artale 30.11.25

Review: Steve Austin, *Grand Canyon: Monument to Catastrophe*, ICR, Santee, CA, 1994

Pages: 284

Master Class in Geology

Not only does this highlight the many features of Grand Canyon consistent with catastrophism and Noah's Flood, it is an introductory text on the science of geology but from a Biblical perspective.

Topics include the canyon layers, formation theories, major formations and landmarks, radiometric dating, fossils, biology, and exploration. This makes it a holistic work and provides many avenues for further study.

While written by a Christian geologist, there is no overt 'preaching', which would be a 'positive' for the secular enquirer, but conversely, perhaps a missed opportunity to include the gospel.

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Preface (p. iii)

I) The Grandest of Canyons (pp. 1-8)

The five themes of the GC:

1. Hierarchy
2. Zonation
3. Relicts
4. Degradation
5. History

The Kaibab Plateau is smaller than the Colorado Plateau.

II) Geological Structure of Grand Canyon (pp. 9-19)

Geologists commonly use a geologic map, cross section diagram, block diagram, and strata column diagram.

An *anticline* is arch-shaped.

A *syncline* is valley-shaped.

An *unconformity* is a flat feature which cuts across a cline.

Dots are used for sandstone, brick pattern for limestone, dots and dashes fro siltstone.

No strata system is contiguous from North America to Europe.

"Why should the *westward* course of the Colorado River and the *westward* orientation of the Canyon deviate so strongly from the *northward* geologic structure? [p17]

III) <u>Interpreting Strata of Grand Canyon</u> (pp. 20-56)

Modern lime muds prove slow deposition, and are dominated by 20μ salt crystals. 'Ancient' ones are calcite and < 4μ.

'Lithographic limestones; form as animals were smothered in lime mud.

Cigar-shaped fossils are often shells of large marine molluscs.

Quartz grains can't precipitate from sea water.

Cross bedding is the dominant property of Supai Group sandstones; current flowed SW, yet northwestern strata show no source of quartz sand grains. While the average angle in Coconino Sandstone is 25°, modern desert dunes slope at 30-34°.

Laminae: sediment layers <=1cm. Each lamina is claimed to represent a season.

Wave height is exponentially decaying against water depth.

High-velocity current can sort and deposit sedimentary grains by weight, density, and shape. Grain is segregated as turbid currents lose speed, creating the parallel laminae.

The 'varve' model predicts the same laminae lake-wide and same unit thickness and kerogen content.

Evolutionists propose burrowing creatures hadn't yet evolved when most of GC was layed down, thus layer boundaries have no burrow marks!

Cracks can form by repeated wet-and-dry-cycling; these may be vertical or horizontal.

Syneresis: volume reduction as clay-rich sediment loses water.

Dr Ariel Roth: "Difficulty with the extended time proposed for these gaps is that one cannot have deposition, nor … much erosion … yet, the contacts are usually 'nearly planar'... One has difficulty envisioning little or nothing at all happening for millions of years on the surface of our planet." [p43]

The Great Unconformity lies between Precambrian rocks and the overlying Tapeats Sandstone. Any extensive chemical weathering has been refuted.

Catastrophic floods cause significant bedrock erosion.

There is meant to be millions of years between the Coconino sandstone and Hermit Shale formations!

IV) <u>A Creationist View of Grand Canyon Strata</u> (pp. 57-82)

Most deeply-buried rocks are crystalline, igneous and metamorphic, probably from Creation Week.

The second division are tilted and faulted sedimentary rocks; the third sedimentary from the Flood; the fourth from post-flood water withdrawal; the fifth landslides and post-Flood volcanism.

Continent uplift and ocean floor downsinking would be an efficient way to cause gravity to collect water in newly-formed ocean basins.

Oxidised minerals in the lowest GC strata contradict the evolutionary assumption of an early reducing [low O_2] environment.
The upper Tapeats contain trilobite trackway ephemerals.

The Redwall limestone forms a prominent cliff face.

Hot flood waters may have oxidised sand grains.

V) <u>How Was Grand Canyon Eroded?</u> (pp. 83-110)

168MT of sediment were measured from 1926-1950, which over 70Ma of the Colorado Rivers lifespan under Evolution would mean 1.3M mi3 of sediment, which is 1,500 GCs!

GC is like a pipe transmitting sediment from east to west.

M. Collier: "No one has ever found the ancestral river … where it was supposed to flow east and south across Arizona." [p92]

The Lake Missoula flood is said to have been 500mi^3 of water flowing at 100mph, leaving 16K mi^2 of scarred terrain, including a 50mi-long trench Grand Coulee carved from basalt and granite.

Incised meanders indicate greater past water flows.

Cliffs often lack basal talus debris indicating fast water flow and recent formation.

VI) <u>Are Grand Canyon Rocks One Billion Years Old?</u> (pp. 111-132)

The greater an isochron slope, the greater the 'age'.

Parent-daughter isotopes are read as ratios to a stable reference one.

Analysed rocks must be a "cogenetic unit", formed in a short timespan; samples must have uniform P:D ratios; rock systems must remain closed;

λ-decay must be known and constant; and P(t) and D(t) lab measurements accurate.

Isochrons may be mistaken as mere mixing diagrams.

^{36}Ar is assumed derived from atmospheric contamination.

VII) <u>Fossils of Grand Canyon</u> (pp. 133-152)

Laminated $CaCO_3$ structures are assumed to be single-celled blue-green algae.

Chiaria circularis are 0.5-5mm in diameter.

Sponges are found in the highest strata.

There are 250 brachiopod known species.

Arthropods are the most diverse groups: insects; spiders; and crustaceans.

Exoskeletons imply growth by molting.

Each lens of the trilobite's schizochroal eye corrects for spherical aberration using Fermat's principle, Abbe's sine law, and Snell's laws of refraction.

VIII) <u>Biology of Grand Canyon</u> (pp. 153-179)

Jackrabbits have ears which act as radiators.

Flooding assists germination by carrying and scratching seeds then depositing them in moist soil.

An Evolutionary population can only be at equilibrium ("Hardy-Weinberg") given.

1. Large numbers of sexually reproducing diploid organisms.

2. Random mating.

3. Neutral alternative gene adaptations,

4. Closed population.

5. No mutations.

6. Identical male and female gene sequences.

IX) <u>The Atmosphere Above Grand Canyon</u> (pp. 180-196)

Radiation during Summer is 7% higher than in Winter.

An average raindrop ha 1M x H_2O of a cloud droplet.

X) <u>Early Peoples of the Southwest</u> (pp. 197-210)

XI) <u>Things to See and Do</u> (pp. 211-222)

Meteor Crater is 80-100ft in diameter, formed from a 60KT meteor travelling at 40K mph! The explosion was equivalent to 1.7MT of TNT.

<u>Appendices</u> (pp. 223-258)

Kolk: underwater tornado.

Olivine: rock of silicate, Fe, and Mg composition.

Protist: single-celled organism, including protozoan, bacteria, some algae, fungi, and ‘viruses’.