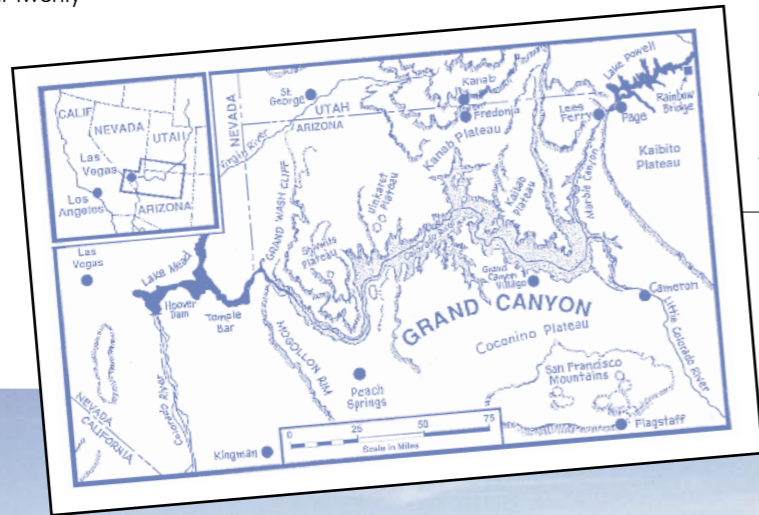


The Grand Canyon Adventure – Part One

Paul Garner

The Grand Canyon of Arizona is an awe-inspiring spectacle drawing millions of visitors every year. Some are content to enjoy the panoramic views from the observation points on the rim, while others hike the trails down into the canyon. Relatively few get to see this geological wonder ‘up close and personal’ by white-water rafting the Colorado River through the canyon. However, it was my privilege to do just that when I took part in a tour organized by the Institute for Creation Research (ICR) in May 2004. ICR has been leading tours to Grand Canyon since 1980 and this was their twenty-fifth trip. We were particularly interested in studying the geology of Grand Canyon

from a creation-flood perspective. For five days and nights we journeyed down-river and camped in the canyon. ICR promised us the experience of a lifetime – and so it turned out to be! So join me my journey – this is the diary of my Grand Canyon Adventure!



Map of Grand Canyon.
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Paul Garner on the south rim of Grand Canyon

Friday 30th April

Arrived at Phoenix Sky Harbor Airport and caught a taxi to the Wyndham Airport Hotel. Found my way to the Registration desk where I was greeted by Andrew Snelling, one of the ICR geologists leading the tour. Then to my room for a good night's sleep – it had been a long journey and we had quite a week ahead of us!



ICR geologists (from l to r): Andrew Snelling, Steve Austin and Bill Hoesch.

Saturday 1st May

Loaded luggage onto the buses and assembled in the hotel for orientation. Welcome by John Morris, ICR President, and overview of Grand Canyon geology by Steven Austin, using a pnemonic based on his own name:

- S**trata
- T**ectonics
- E**rosion
- V**olcanoes
- E**xponential decline

Other short talks on radioisotope dating of Grand Canyon rocks (Andrew Snelling), geology of northern Arizona and southern Utah (Bill Hoesch), fossil nautiloids of Grand Canyon (Steve Austin), animals and plants of Grand Canyon (Frank Sherwin), and the Anasazi Indians (Larry Vardiman). We were also given a weather forecast and practical tour information. Importance of punctuality emphasized – there is a forfeit if we don't keep to time. If we arrive late at the bus we 'wear' a cardboard clock around our necks until next stop!

There are three tours running simultaneously – a bus tour, a hiking tour, and a raft tour. I'm on the latter. We'll be together for Saturday and Sunday, then we go our separate ways, but we'll meet up again for a 'Victory Dinner' at the end of the tour. Steve Austin and Andrew Snelling will accompany the rafters.

After lunch, we board buses and set off for south rim of Grand Canyon. We stop for a snack at Flagstaff,

where snow-capped peaks of San Francisco Mountains – large complex of volcanoes – can be seen on horizon. Next stop is Grand Canyon Village, where we visit IMAX Theatre to see spectacular film about history and exploration of Grand Canyon. Dramatic footage of Colorado River rapids makes some of us wonder what we've let ourselves in for! Actual wooden boats used by John Wesley Powell's expedition (1869) on display behind theatre building.

Arrive at Mather Point – observation site on south rim – as sun is setting. My first view of Grand Canyon! It's every bit as spectacular as you might imagine (see inset box 1). As light fades, we depart for Yavapai Lodge East to settle into rooms and have dinner.

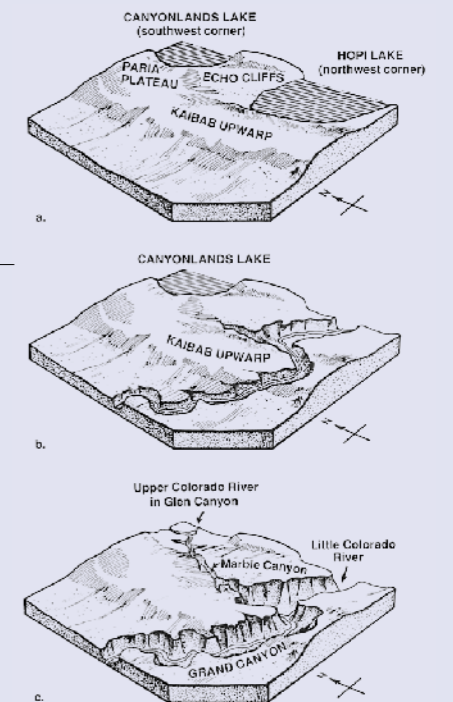
INSET BOX 1: GRAND CANYON OF ARIZONA

Grand Canyon extends for 277 miles through northern Arizona, attaining a depth of more than a mile and ranging from 4 to 18 miles wide. The altitude of the south rim is 7,500 feet above sea level, slightly lower than the north rim which is at 8,500 feet elevation above sea level. The Colorado River runs its course at about 2,500 feet above sea level. Within the canyon there are hundreds of side canyons and many pinnacles and spires that tower above the river. The rock layers are exposed magnificently to view because of the lack of vegetation, allowing the sunlight to pick out the varied colours and hues.

Most people suppose that Grand Canyon was carved by slow and gradual river erosion over millions of years. However, some geologists now suspect that the canyon was established by the catastrophic drainage of a lake or series of lakes to the east. This has been called the breached dam theory. Evidence of ancient lakes has been found in eastern Arizona in the form of lake sediments with freshwater fossils. There are also documented examples of canyon systems forming by catastrophic processes, though on a much smaller scale, in the present day. For example, on 19th March 1982, a catastrophic mudflow cut a canyon system up to 140 feet deep just north of Mount St Helens.

Breached dam theory for catastrophic, post-Flood erosion of Grand Canyon.

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Grand Canyon at sunset from Mather Point.

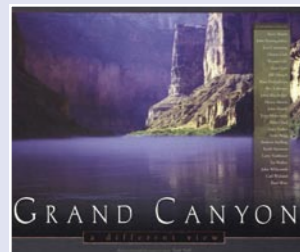
Sunday 2nd May

After breakfast we join Grand Canyon Baptist Church for morning worship – ‘guest’ preacher is Dr Henry Morris III. After the service we journey short distance to Desert View Tower for ‘mini-lectures’ on the rim by ICR staff. Canyon is a fantastic backdrop – difficult to imagine a more beautiful place to listen to talks.

Back to buses for lunch at Cameron Trading Post. Prize offered for eating a whole Navajo Taco – but most of us settle for half-size portion! From Cameron, the rafting group head to Page where we will enjoy one last night of comfort before voyage down the river! We drop baggage at hotel, then go for dinner in Rainbow Room at Wahweap Marina – a glass-walled restaurant offering spectacular views over Wahweap Bay in Lake Powell. Lake Powell is at eastern end of Grand Canyon not far from the Glen Canyon Dam – 186-miles long with lots of water sport activity and houseboating.



Paul Garner at Lees Ferry.



Tom Vail's book

INSET BOX 2: CONTROVERSY OVER CREATIONIST GRAND CANYON BOOK

The availability of Tom Vail's book in Park Service shops has provoked a storm of protest from anti-creationists. In December 2003, the presidents of seven geological societies wrote a letter to the superintendent of Grand Canyon National Park demanding that the book be withdrawn from sale.

In their letter the geologists claimed that, by selling the book, the National Park Service is giving the impression that it approves of “the anti-science movement known as young Earth creationism.” Of course, the book is not anti-science – the contributors include many PhD scientists, including several who have published original research on Grand Canyon geology.

A lobby group called Public Employees for Environmental Responsibility (PEER) also weighed into the controversy. Their executive director, Jeff Ruch, said, “The Park Service leadership now caters exclusively to conservative Christian fundamentalist groups.” He added, “The Bush Administration appears to be sponsoring a program of Faith-Based Parks.”

The letter from the geological societies urged that, if the book remains available in Grand Canyon bookstores, “it be clearly separated from books and materials that do discuss our scientific understanding of Grand Canyon geology.” In May 2004, the book appeared to have been placed separately from the other books in the Park Service shop at Yavapai – but this just made it more noticeable!

By sunset, we're tired – and have early start ahead of us. Must be up for breakfast at 5.00 am – although we almost don't make it to bed when lift gets stuck between floors at hotel! Perhaps we've eaten too much at the Rainbow Room?

Monday 3rd May

Breakfast at nearby restaurant – we're up too early for the hotel! Suitcase is loaded on bus for storage at Flagstaff – we now have only the kit needed for river trip.

Bus takes us to Marble Canyon Lodge where we meet river crew – ICR use Arizona River Runners. Our chief boatman is Tom Vail, who has led more than 150 canyon tours over the past 25 years, and he is ably assisted by Trey Cavolo, John Kelly, and Mark Piller. Tom is the author and compiler of *Grand Canyon: A Different View* – a creationist book which has stirred up enormous controversy (see inset box 2).

Tom gives pep talk about the rules of the trip – safety is paramount. The canyon is a potentially dangerous place so adhering to the rules is vital. Tom encourages us to remove wristwatches. We are now to operate on ‘river time’: “breakfast at 8.00, lunch at 12.00, dinner at 7.00 – whatever the time is!”.

Bus takes us to Lees Ferry where the rafts will launch. Each of us is provided with three waterproof duffel bags. First holds our sleeping kit, second our clothes and toiletries, and third the few items we need during the day (suncream, camera, hat). Only latter is available while on raft – others are stowed under tarpaulins in centre of raft and retrieved when we make camp.

There are two ‘S-rig’ rafts – about 15 people on each. In bottom of each raft is storage for food and equipment, duffel bags are stowed under tarpaulins in middle, and passengers seated around outside. You can stand up and move around – except when going through rapids. Then you sit down and hold on tightly! Sitting near front of raft is okay so long as you don't mind getting very wet!

We load rafts and leave Lees Ferry in excited anticipation.

Begin journey through Marble Canyon. In the walls of the canyon we cut down through the geological sequence – Kaibab Limestone, Toroweap Limestone, Coconino Sandstone, Hermit Shale, Supai Group (see inset box 3).

First stop is for ICR geologists to collect sample of Hermit Shale – will be analysed for pollen and plant spores. Grand Canyon rocks can only be collected for legitimate scientific research with a permit from the National Park Authority.

Next stop – for lunch – is near Badger Creek Rapid. River guides get rid of snake sunning itself where kitchen will be and prepare food. As we soon find out, the food on the trip is great. We're catered for very well. We also find that hygiene is a priority – all the plates and utensils are washed thoroughly before and after each meal. We're a long way from help if anyone becomes ill.

After lunch we head off with Nautiloid Canyon our destination. However, we don't make it that far down river so first night is spent at Shinumo Wash surrounded by towering cliffs of Redwall Limestone. Camp routine is established. When we leave the rafts, each of us finds a sleeping spot and marks it with our lifejacket. Then we join the ‘fire-line’ to unload the boats. Afterwards we organize our sleeping area. Tents are available – and some ladies choose to



Tom Vail.

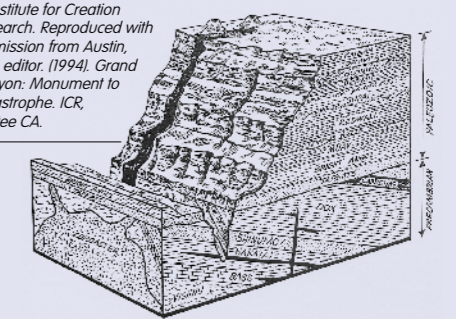
INSET BOX 3: GRAND CANYON GEOLOGY

Grand Canyon exposes a thick sequence of layered sediments, sitting on top of an eroded basement of older sedimentary rocks, igneous rocks (granites) and metamorphic rocks (schists). In this sequence the harder layers (e.g. sandstone, limestone) form vertical cliffs; the softer layers (e.g. shale) form slopes.

About 6,000 feet of younger sediments were deposited on top of the Grand Canyon succession – but they have been eroded away from the canyon rim. However, as you travel north from Grand Canyon into southern Utah, the younger layers can be found exposed in a series of ‘steps’ which has become known as the Grand Staircase.

Geological block diagram showing rock structure and topographic form below the north rim of Grand Canyon.

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ROCK TYPES	
SEDIMENTARY ROCKS	IGNEOUS ROCKS
Sandstone	Basaltic Rocks
Siltstone	Dike (sills & dikes)
Shale	Granite
Limestone	
METAMORPHIC ROCKS	
Schist & Gneiss	

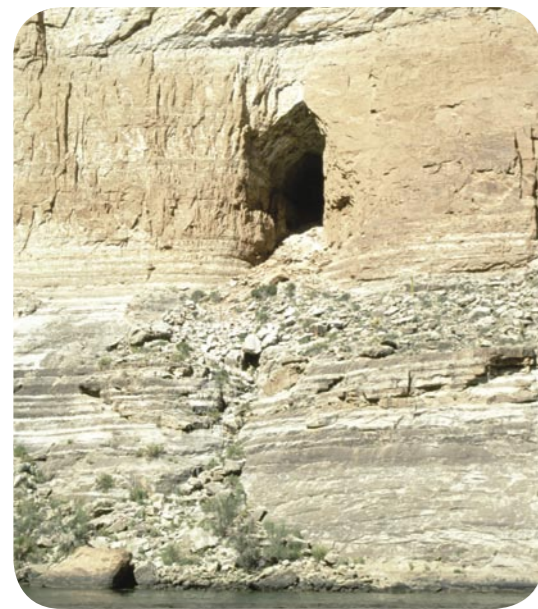
use them – but most of us fall asleep under the stars. What about the ‘facilities’? We have a chemical toilet hidden among rocks or bushes – with a great river view! You wash in the river.

Sleeping kit consists of tarpaulin, foam mattress, sleeping bag, sheet (too hot to use it!), and small inflatable ‘pillow’. Did I sleep well? Mostly – though sometimes a little fitfully.

Tuesday 4th May

Morning alarm call is a loud shout from Tom – “Coffee!” Then a few minutes later – “Breakfast!” I remember to shake my boots and drying clothes for scorpions! After breakfast and morning devotions we load rafts and set off down river. Spectacular limestone and dolomite interbedding in the Redwall Limestone! We pass Stanton’s cave, named after Robert B. Stanton, leader of a railroad survey, who ended his first trip into the canyon here – at South Canyon – in 1889. We also marvel at Vasey’s Paradise – a little oasis where water is bursting from the rocks. The walls are covered with mosses, ferns, and flowering plants. In 1869, John Wesley Powell came across this site and named it after a botanist who had travelled with him the previous year.

We pull up at Redwall Cavern to look at fossils in Redwall Limestone. From a distance, the cavern looks like small notch in base of cliff – but appearances are deceptive. It is an immense cavern carved by the river when in flood. John Wesley Powell thought it would seat 50,000 people – something of an exaggeration – but it is very big!



Stanton's Cave

INSET BOX 4: FOSSIL NAUTILOIDS OF THE REDWALL LIMESTONE

Fossil nautiloids were first discovered in Grand Canyon in 1966. In 1995, creation geologists Steve Austin and Kurt Wise documented 71 nautiloids in Nautiloid Canyon and began to consider the possibility of a mass-kill event. In March 1999, Steve Austin examined other ledges along the river and within a few days discovered *hundreds* of nautiloids. It became apparent that the nautiloid layer runs the entire length of Grand Canyon.

On average this bed contains one nautiloid per square metre. There are easily one billion nautiloids in the layer – possibly as many as ten billion. The nautiloid shells come in a range of sizes – small, medium, to large. This means that the fossil nautiloids represent an entire population that was buried in a single event. Curiously, the nautiloid fossils are concentrated in the middle of the two-metre-thick bed – not at the bottom. About 15% of them stand vertically within the bed.

Measurements of the orientation of the shells suggest that the deposit was not produced by the random fall of dead nautiloids onto a motionless and static ocean floor. Rather, the shells appear to have been deposited by a strong current moving towards the southwest.

Steve Austin has come to the conclusion that this layer was deposited by a gigantic, high-speed sedimentary flow moving through northern Arizona. Billions of nautiloids were caught up in this flow, which was deposited in minutes. Apart from the nautiloids, this bed is typical of the rest of the Redwall Limestone. Were Grand Canyon limestones really laid down over millions of years in calm and placid seas?



One of the fossil nautiloids at Square Hole Ledge



Steve Austin interview



Inside Redwall Cavern.

We set off again – but soon reach our next stop at Square Hole Ledge. I’ve been looking forward to this – a chance to see the famous nautiloid bed. We ‘get our eye in’ and soon we see fossil nautiloids everywhere! Large, cigar-shaped, chambered shells that housed a squid-like creature. How did so many come to be fossilized together like this? Steve Austin tells us the fascinating detective story (see inset box 4).

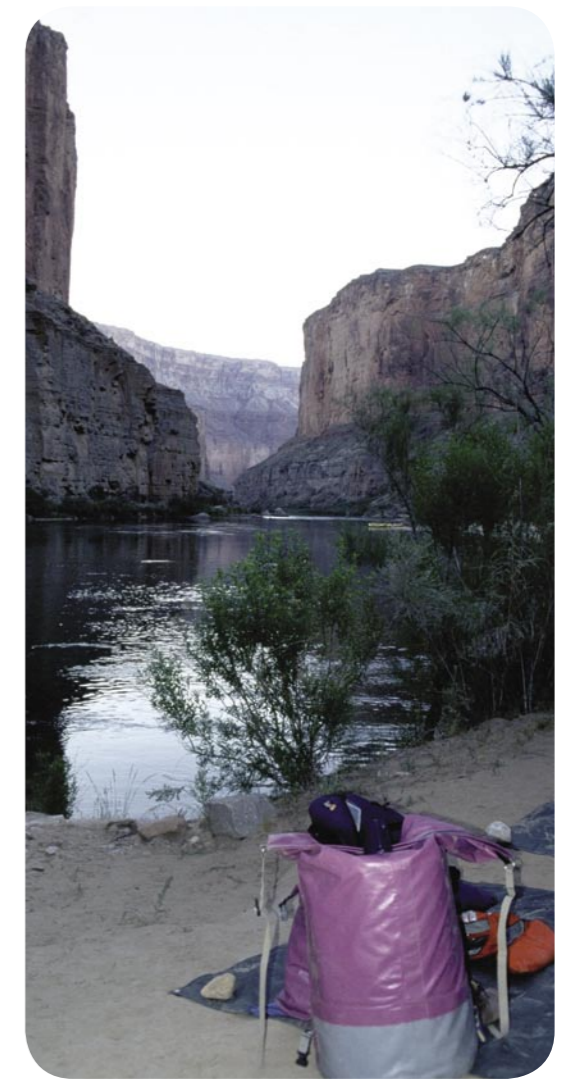
We have a film crew with us making two documentaries for ICR – one about the fossil nautiloids and the other about radioisotope dating of Grand Canyon rocks. They film Steve and Andrew speaking about the nautiloid bed and the evidence it offers for catastrophism.

Next stop is Nautiloid Canyon itself – where these extraordinary fossils were first discovered. It’s a small side canyon about 100 yards off the river. After lunch we ascend into the canyon to see the nautiloids exposed in the limestone pavement beneath our feet. More filming for the documentaries.

Rest of day spent on the river. Beneath the Redwall Limestone we see ancient channels carved into the Muav Limestone and filled in with the Temple Butte Limestone. The physical evidence of erosion means that there is some time missing here – but how much? Two entire geological systems – the Ordovician and Silurian – are missing. If conventional dating is right, that’s a time gap of 100 million years. But the channels are only 30 feet deep – surely there should be more evidence of those 100 million years?

We make camp at Saddle Canyon. Great ‘bedroom’ – with lovely river views! Devotions are good tonight. Tom has a stirring testimony. We listen as darkness falls.

(End of part one – the second part will appear in our next issue)



Camping at Saddle Canyon.