

THE GRAND CANYON River Runner

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preserving public access to the Colorado River

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GRAND CANYON THREATENED – STILL



In the past few months Grand Canyon has been the object of multiple actions that could have significant impacts upon the iconic landscapes that comprise the crown jewel of our national park system.

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The Glen Canyon Dam LTEMP EIS has completed public scoping and planners are now developing a range of alternatives based on a long list of criteria including comments derived from public scoping and the recently completed public comment period. The purpose of the EIS is summarized on the LTEMP website as follows:

“The Department of the Interior, through the Bureau of Reclamation (Reclamation) and the National Park Service (NPS), will prepare an environmental impact statement (EIS) for the adoption of a long-term experimental and management plan (LTEMP) for the operation of Glen Canyon Dam. The EIS will fully evaluate dam operations and will provide the basis for decisions that identify management actions and experimental options that will provide a framework for adaptively managing Glen Canyon Dam over the next 15 to 20 years.”

Many stakeholders, including GCRRA, provided input during the public scoping period, yet it is frequently the case that hydroelectric power interests will carry the most weight in discussions of how to best manage the dam.

Lew Steiger has contributed a thought-provoking and timely article to this issue of The River Runner that, in part, addresses the LTEMP, the importance of which cannot be overstated. Simply put, this process is absolutely critical to the future health and recovery of the river corridor between Glen Canyon Dam and Lake Mead. If you wish to get involved in the process you can sign up for alerts and updates on the LTEMP website at <http://ltempeis.anl.gov/index.cfm>.

In a disturbing and startling announcement, the Navajo Nation has unveiled plans for an aerial tram to be built into the cliffs of Grand Canyon in order to carry visitors from the rim to near the confluence with the Little Colorado River. There visitors will find a restaurant and restrooms at river level before returning via this same tram to a large tourism complex on the rim overlooking the Canyon.

So far there is little detail available to address concerns about water supply and light and noise pollution since plans also tentatively include a new airport at the rim complex. The proposed project was detailed in *The Arizona Republic* by journalist Kathleen Ingley (April 15, 2012). Of major concern to environmentalists and Canyon aficionados is the blatant exploitation of a wild and scenic landscape in a manner that will degrade both these values forever. While no one disputes the need for economic opportunity on the Navajo reservation, to provide it at the cost of permanently scarring a sacred and treasured landscape is unconscionable.

Probably the most disturbing element to the entire proposal lies in the fact that there was not any discussion with other tribes, some of whose most sacred sites are in close proximity to the proposed tramway. According to writer Cindy Yurth in *The Navajo Times* (April 16, 2012) the Hopi have accused "the Navajos of failing to consult with them before negotiating with would-be developers at the confluence of the Colorado and Little Colorado rivers, and the Hopis say they oppose any development in the area."

The National Park Service has weighed in on the side of wilderness and preservation. Superintendent Uberuaga has been quoted as saying, "There would be no development, from our perspective."

If the next scenario sounds familiar, it should. Once again Tusayan is in developers' crosshairs. Tusayan, the small town located just a mile from the south entrance of Grand Canyon, was to be the location of Canyon Forest Village, which was ultimately rejected several years ago. This new proposal (from Stilo Development Group, the same company that proposed Canyon Forest Village) would develop private lands around Tusayan, but plans provide no specific insights into how water needs will be addressed for an ambitious complex of spas, hotels, restaurants, housing and conference centers.

Water is the key to this expansion given that there is no natural surface water on the South Rim of Grand Canyon. Grand Canyon Village receives its water from a pipeline that stretches from Roaring Springs on the north side of the Canyon. Tusayan utilizes local wells. The concern is that additional drilling could adversely impact seeps and springs in Grand Canyon due to the suspected interconnectivity of aquifers and springs.

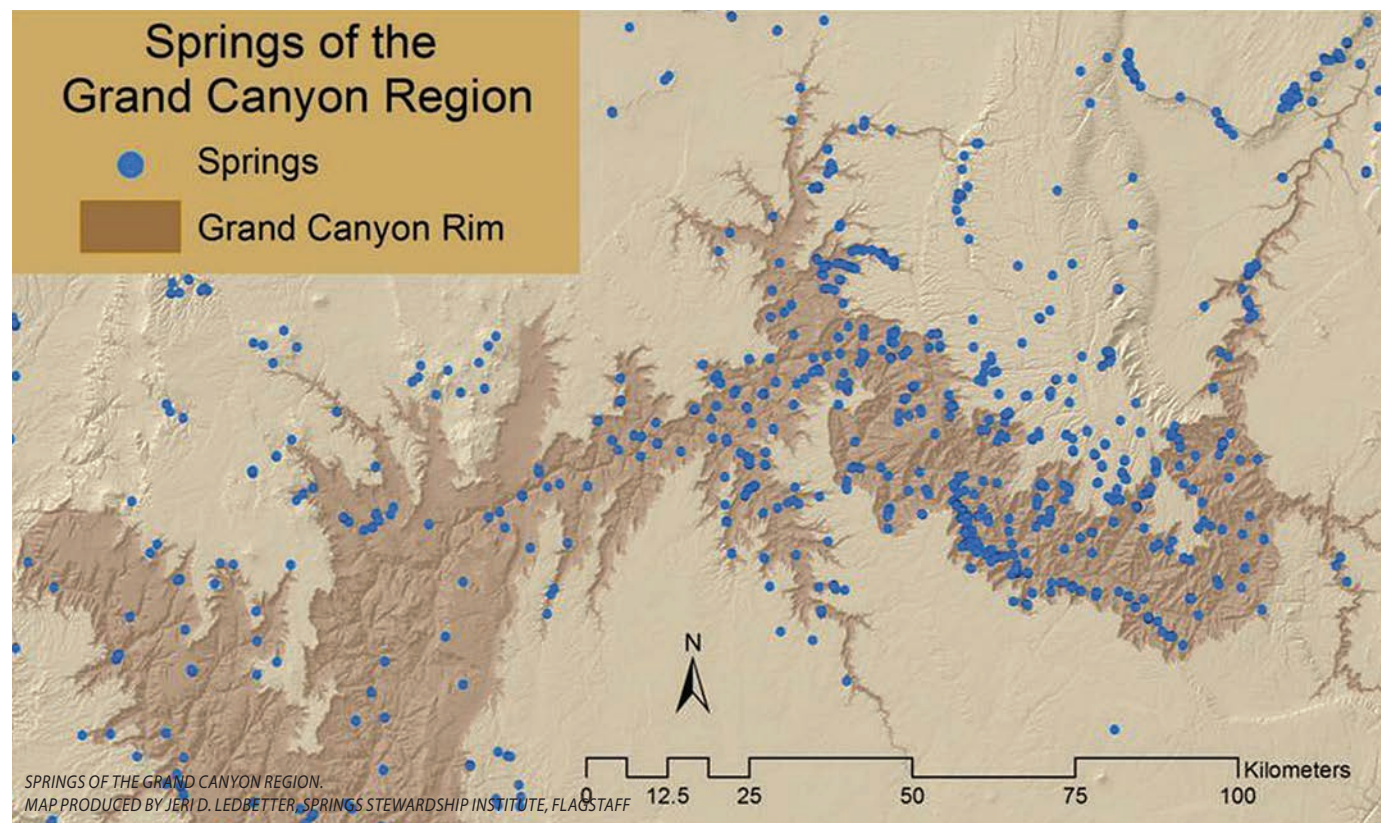
Dr. Larry Stevens has written a highly informative article about the Canyon's seeps and springs in this issue of *The River Runner*. In it he discusses this interconnectivity and addresses the potential for irreparable harm that the Tusayan development could pose for hundreds of localized ecosystems that revolve around seeps and springs within Grand Canyon.

One potential attack on Grand Canyon was averted for the time being when, on January 9, 2012, Secretary of the Interior Ken Salazar imposed a 20-year moratorium on development of all new mining claims within a wide safety zone surrounding Grand Canyon. This effectively withdraws from development the hundreds of mining claims on over a million acres in House Rock Valley and other vulnerable tributaries of Grand Canyon, including areas adjacent to the Havasupai reservation. The National Mining Association, et al., brought suit against the federal government in the U.S. District Court, District of Arizona, in late February.

The Grand Canyon Trust, which led a comprehensive opposition to all uranium mining in the Grand Canyon region, is a good source of information as developments continue to unfold. The uranium issues are complex, but key issues involve the potential for contamination of vast watersheds that ultimately affect agriculture and drinking water for millions of people in Arizona, Nevada and California. For more information, please see the Trust's Uranium Mining Fact Sheet available on the web at: http://www.grandcanyontrust.org/documents/gc_uranium_factSheet.pdf.

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Unfortunately, there is nothing new to report on the proposed River Heritage Museum. The Grand Canyon River Heritage Coalition is working diligently with the Grand Canyon Association in order to produce a mutually acceptable memorandum of understanding that would move the project forward. While GCA and Park personnel have stated repeatedly that they are enthusiastic about the project, progress comes only in baby steps. The already completed architectural plan for the repurposing of the historic Laundry Building details a welcoming display space that will provide the anchor point for a revitalized historic district and Heritage Campus at the south rim of the Grand Canyon. The museum will be a family friendly exhibit space housing a rotating selection of the Park's boat collection, historical artifacts, a multimedia theater and dynamic exhibits. Grand Canyon was virtually the last great unexplored region of the contiguous 48 states, and this museum will bring its history to life.



Springs Ecosystems of Grand Canyon

Larry Stevens

Introduction

Tucked in nooks and crannies, seeping from hillsides, or pouring out of cliff faces in joyous eruptions, the springs of Grand Canyon are miraculous emergences of water in the desert (Fig. 1). Arizona, vying with Nevada as the nation's driest state, has the highest density of springs. But each spring is unique, differing from all others by its unique combination of water quality, temperature, form, slope-aspect, and the plant and animal species they support. Springs are some of the most intriguing, biologically and socioculturally diverse ecosystems in the Southwest and throughout the world. Grand Canyon's Vaseys Paradise (Mile 32R; Fig. 2) is an excellent example of a spring with many co-occurring elements and processes. This multi-dimensional perspective is important to understanding the complex issues facing Grand Canyon springs, and why their protection is so extraordinarily important.

John Wesley Powell (1875:406) named Vaseys Paradise after his colleague George W. Vasey (1822-1893), a botanist who worked at the Smithsonian Institution and greatly improved our understanding of the grasses of the United States. However, Vasey never saw the rushing outflow and profuse jungle of vegetation that Powell named after him. Robert Brewster Stanton photographed the site from downstream in January 1890, and the U.S. Geological Survey photographed it in 1923, as have tens of thousands of river runners since then.

Springs as Ecosystems

Springs are places where groundwater emerges at the Earth's surface, and part of what makes them so intriguing is that they are groundwater-dependent ecosystems that develop in response to surface processes. Hydrologists are primarily concerned with the geologic context, aquifer functioning, and geochemical processes that bring water to the surface, while biologists and anthropologists focus on the surface and near surface characteristics and processes that influence biodiversity, population dynamics, human history, and sociocultural issues. Complex interrelationships among physical and biological variables make the study of springs dauntingly interdisciplinary, and require communication among disciplines that do not normally talk to each other. The few good examples of such studies include those by Odum (1957) on Silver Springs in Florida, Blinn (e.g., 2008) on Montezuma Well in Arizona, and Brock (1978) on

the hot springs of Yellowstone National Park, so there is much more to learn about springs ecosystems. Vaseys Paradise is an intriguing springs system because it emerges as a gushet, a springs type, the ecosystem characteristics of which have not received much scientific attention. Only some of Vaseys Paradise characteristics and processes have been studied.

Springs Hydrogeology

Vaseys Paradise emerges in several gushet sources and its diffuse flow across the cliff base and through the vegetation makes the measurement of flow rate difficult. Emery Kolb took a now-famous photograph of E.C. LaRue photographing Vaseys Paradise on the USGS Birdseye Expedition. That 1923 expedition was the first to try to estimate the springs' flow, considerably overestimating it at 10 cfs. The photograph shows the flow at that time was about normal

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PHOTO BY CHRISTY SCHENCK



PHOTO BY L.E. STEVENS --- VASEYS PARADISE AT MILE 32R ON THE COLORADO RIVER IN GRAND CANYON NATIONAL PARK, ARIZONA.

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for late summer (likely less than 2 cfs). Most Grand Canyon springs are smaller than Vaseys Paradise, although the Blue Springs, Havasu Springs, Thunder River Springs, Roaring Springs, Bright Angel Springs, and Ribbon Falls Springs complexes collectively contribute more than 300 cfs to the mainstream Colorado River, which is more than 20 percent of the historic baseflow of the river - a far larger contribution to the river than previously has been appreciated.

Springs flow is largely derived from precipitation and infiltration from the surface. Nearly 90 percent of the precipitation that falls on the Colorado Plateau evaporates, a few percent runs off, and a little is transpired by vegetation, leaving only a few percent to pass into the Earth's surface to recharge aquifers. The region's aquifers include shallow Cenozoic basalt flows, the progressively deeper Kaibab, Coconino, and Redwall formations, as well as the deeper, uprising groundwater from faulted basement rocks studied by Laurie Crossey, Karl Karlstrom and their colleagues (2006). The upper aquifers generally consist of fractured rock strata underlain by impermeable shale or mudstone strata, with springs emerging from within, or at the base of the water-bearing stratum (Fig. 1).

The geochemistry of a spring's water reflects the complexity of its flow path, the subterranean course from the point of infiltration to the spring's source. Springs that emerge from upper elevation basalt and limestone aquifers tend to have cool, high quality (low ion concentration) waters; whereas, those emerging from progressively deeper strata tend to have greater ion enrichment. Continuing infiltration of surface water along the flow path, downward movement of groundwater through overlying aquifers, and upward movement of deep crustal waters all contribute to the quality of a spring's flow. Snowmelt on the North Rim passes relatively quickly into the Redwall formation, and flows out along fault and fracture alignments. The flowpath duration for Vaseys Paradise is days to decades; whereas, that of some of the Redwall aquifer springs emerging on the Tonto Platform in central Grand Canyon is several thousand years (Monroe et al. 2005). Elsewhere in the West, springs' flowpaths may exceed 10,000 years, and in Australia's Great Artesian Basin, a million years.

Huntoon (1981) described the geochemistry and derivation of flow at Vaseys Paradise and other Marble Canyon springs in relation to surrounding bedrock geology and geologic structure of the North Rim. His hydrogeological explorations of the region revealed that the

numerous springs complexes emerging between Fence Fault (Mile 30) and the Eminence Break (Mile 44) are derived from separate, parallel fault and fracture systems from the North Rim. Each fracture system supports springs with slightly different water chemistry and thermal properties. Oddly, the Fence Fault springs emerging on the left (east) side of the river are derived from the North Rim, passing underneath the river and emerging on the far side. Huntoon reported that the springs' flow through the fractures travel for several miles, yet are highly responsive to seasonal and even daily precipitation events, helping account for the large seasonal differences in Vaseys Paradise flow. Its flow and water quality characteristics also occur at the other four coldwater springs complexes emanating from the Redwall formation on the north side of Grand Canyon, including: Bright Angel, Roaring Springs, and Ribbon Falls in upper and middle Bright Angel Creek; the Shinumo Creek sources; Thunder River and Tapeats Creek sources; and Deer Creek.

Biological Diversity

Many springs support rare and sometimes endemic (unique) species: I estimated that nearly 2 percent of the endangered species in the United States are springs-specialist taxa. Among the endemic springs species in Grand Canyon are: MacDougall's flaveria (*Flaveria macdougallii*) at mineral springs from Mile 136.5L downstream to about Mile 177L; the masked clubskimmer dragonfly (*Brechmorhoga pertinax*), which occurs only in the outflow of small, warmwater springs from Nankoweap Creek downstream to Stone Creek; the Arizona wetsalts tiger beetle (*Cicindela hemorrhagica arizonae*), whose range matches that of the masked clubskimmer; an as-yet-undescribed *Pyrgulopsis* springsnail; and a possibly new-to-science giant waterbug (*Belostoma* near *flumineum*), to name a few. Many rare but non-endemic aquatic and wetland species also are found at Grand Canyon springs. For example, although the protection of poison ivy (*Toxicodendron rydbergii*) is not a conservation priority, it is a rare species in the Colorado River corridor in Grand Canyon, with only three populations (likely single individuals), each found only at a riverside spring: Vaseys Paradise, Lower Deer Creek Spring (136R), and 142R Spring. Vaseys Paradise also supports a population of water smartweed (*Persicaria amphibia*), one of very few along the river. Springs like Leopard Frog Marsh at Mile 9L host several rare plants (American bugleweed - *Lycopersicum americanum*, rice cutgrass-*Leersia oryzoides*), as well as a population of Niobrara ambersnail (*Oxyloma haydeni haydeni*), and a now-extirpated population of northern leopard frog (*Rana pipiens*). At a larger scale, Rich Bailowitz, John Polhemus, and I (2008, 2009) reported 17 and 53 percent of the dragonflies and aquatic waterbugs, respectively, in the Grand Canyon region were found at 3 or fewer of more than 500 sites sampled, sites that were primarily springs.

Data compiled by Earle Spamer and Arthur Bogan (1993) reveal that Thunder River Springs has the highest concentration of landsnails (12 species) of any point inside Grand Canyon. Most of these are lovely but very tiny species. With 8 species, Vaseys Paradise is not far behind Thunder River. By far the best known of these landsnail species is the endangered Kanab ambersnail (*Oxyloma haydeni kanabensis*; Fig. 3). Discovered there by Dean Blinn's aquatic ecology crew in 1990, Vaseys Paradise supports one of only three known populations of this taxon. Mature ambersnails reach a length of about ¾ inch, and it is an obligate wetland species. The Vaseys Paradise population lives on

decaying monkeyflower (*Mimulus cardinalis*) stems, and on non-native watercress (*Nasturtium officinale*). A population at Three Lakes northwest of Kanab, Utah feeds on cattails and rushes.

The Vaseys Paradise population has an annual life cycle, emerging from eggs in August, increasing in size through the growing season. Ambersnails go into dormancy for the winter by using mucus to seal the aperture of their shells against firm substrata. Unfortunately, the snails do not make wise over-wintering site choices, rather commonly attaching themselves to fallen leaves that usually blow away. Consequently, relatively few survive the cold, shaded winters of Vaseys Paradise. The survivors that emerge usually in April, feed and grow into June, when they begin their strange, hermaphroditic adult life. They mate and lay several gelatinous masses of eggs. However, do they first function as males when they are too small to produce many eggs, saving their female personae for July when they can produce more eggs? More detailed research is needed. The adults die and the eggs hatch in August, starting the snails' cycle of life over.

Life is hard when one is slow, and as if things aren't hard enough, Kanab ambersnails are the only native wetland snail species large enough to support the only known Arizona population of the parasitic flatworm, *Leucochloridium cyanocittae*. Flatworm eggs that are dropped in bird faeces onto springs vegetation are consumed by a snail. The parasite develops in the snail's gut cavity, eventually occupying more than half the volume of the snail. This myricidium stage of the parasite produces lozenge-like sporocysts - acid pink and green capsules filled with metacercariae, the cyst-like next life stage of the parasite. The parasite drives its host to the edge of the vegetation patch and very conspicuously pulses the green and pink sporocysts in and out of the snail's eyestalks. A bird, attracted to the rapidly pulsing, brightly-colored eyestalks picks at the snail, stimulating the sporocysts to eject out of the eyestalks and wriggle around on the ground. Mistaking the sporocysts for worms, the bird consumes them and the parasite's life cycle is completed in the bird's gut. Unfortunately the now-blind snail can continue to produce sporocysts. About 10 percent of the Kanab ambersnail population at Vaseys Paradise is infected with *Leucochloridium*, so this rare snail supports an even more rare and bizarre parasite. Although far more rare than the ambersnail, the parasite does not qualify for endangered species status. Nonetheless, its presence demonstrates the level of ecological complexity that can develop at springs.

Another threat to the Kanab ambersnail is an as-yet-unpublished report that genetic analyses do not support the taxonomic legitimacy of the snail. Kanab ambersnail may soon be subsumed into the much more widespread Niobrara ambersnail, a change that eventually will greatly reduce the Vaseys Paradise population's importance to federal managers, as it would lose its status as an endangered species.

Ambersnail Habitat Stewardship

Ambersnail habitat at Vasey's Paradise is larger now than it was in predam time. Flow regulation by Glen Canyon Dam has increased the vegetated area of Vaseys Paradise by approximately 40 percent since 1963. Pre-dam photographs of the spring show that the vegetation required by the snail was trimmed by annual floods to above the 80,000 cfs stage. Increased post-dam habitat likely has allowed the

ambersnail population to increase concomitantly. Planned floods to manage sand and sandbars are federal management actions that remove some of the expanded post-dam Vaseys Paradise vegetation, and kill endangered ambersnails living in the flood zone. Each planned high flow from Glen Canyon Dam since 1996 has required much federal compliance, including the issuance of a U.S. Fish and Wildlife Service Biological Opinion to mitigate impacts to this endangered species. One result of these political discussions was the introduction of the Kanab ambersnail into Royal Arch Creek in the mid-1990s as an insurance population. That introduced population appears to be persisting.

However, nothing except the construction of Glen Canyon Dam has really changed life for the Vaseys Paradise population of this landsnail. It remains a rare species in Arizona, one whose population was expanded by Colorado River flow regulation, and one that will likely continue to live out its odd, hermaphroditic, parasite-afflicted life cycle in the profuse growth of monkeyflower, watercress, and poison ivy of Vaseys Paradise, as it likely has for millenia.

Dire Threats to Springs

Grand Canyon Wildlands Council (2002) reported that many Grand Canyon National Park springs were essentially in pristine ecological condition, and better protected from human impacts than other regional land management units. However, most springs on the flatlands of the southern Colorado Plateau are affected by human activities. Livestock management and flow regulation impacts are nearly ubiquitous on springs throughout the West. These undisturbed springs in Grand Canyon are remarkable laboratories at which to understand natural ecological processes. Most or all of the springs in this arid region stand to be negatively influenced by global climate changes that reduce precipitation, increase evaporation, reduce infiltration, or increase climate variability. But the most dire human impacts to springs involve unsustainable groundwater extraction and groundwater pollution. The possibility of greatly expanded urban development and possible groundwater pumping at Tusayan and elsewhere may threaten springs emerging from the South Rim, as well as Blue and Havasu springs. Uranium mining may contribute to groundwater and surface water pollution.

Ecological threats to springs are universal, and the failure to pay attention to springs has resulted in a global crisis for these "point sources of bio-cultural diversity." Even though Vaseys Paradise emerges in Grand Canyon, its care requires protection of the entire aquifer on U.S. Forest Service land on the North Rim. Even though many springs in the region have been strongly negatively influenced by post-emergence flow and land manipulation, springs can be restored relatively easily, provided the aquifer has not been strongly affected. Grand Canyon Wildlands, working with the Bureau of Land Management, has rehabilitated the Pakoon Springs complex in upper



PHOTO BY L.E. STEVENS---KANAB AMBERSNAIL SHOWING THE TREMATODE PARASITE SPOROCYST EXPRESSING IN ONE OF THE SNAIL EYESTALKS.

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Grand Wash, transforming the former cattle and ostrich ranch to one of the most impressive stands of wetland habitat in Arizona. Protection of springs flow everywhere requires clear information on the distribution and ecological condition of springs, and strong partnerships among land and water managing agencies. We all hope that such partnerships are forged and work to improve stewardship of springs in this region and throughout the world.

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JIM MACKENZIE'S FOSSIL FIND, 2010



"ENGLEMAN PRICKLY-PEAR" © MARI CARLOS 2010



"RAVEN" © MARI CARLOS 2010

On the Backs of Mules and from the Rivers of Images: The Amazing Ellsworth and Emery Kolb of Grand Canyon

By C.V. Abyssus

The Kolb Brothers, Ellsworth and Emery, arrived at the Grand Canyon 110 years ago, began taking photographs of mule trips and canyon scenery soon thereafter, built a studio and home on the brink of the canyon, and embarked on their "Big Trip" on the river through the canyons of the Green and Colorado Rivers, taking the first motion pictures of the canyons and fastwater that they ran in sixteen-foot wooden boats.

On the centennial anniversary of the "Big Trip," coinciding with that of Arizona statehood, it seems only appropriate that Grand Canyon National Park and the Grand Canyon Association help to celebrate their adventurous story with the first-ever exhibit devoted entirely to Ellsworth and Emery and their family. It opened in December 2011 and is planned to be semi-permanent. It will run until September 2012, returning in December 2012 for another nine months.

As their story is remarkable and there is a wealth of information about them, they are very deserving of a full-length biography. Many are the stories, sometimes approaching legendary myth, and as I wrote the exhibit text, I approached them as new information and attempted to verify their truthfulness. You may be surprised, as was I, of certain "facts," among others: why was Ellsworth called "Ed" when he had a brother named Edward?; Emery gave Ellsworth credit for naming Cheyava Falls based on a Hopi word meaning intermittent, but does it?; and can "carved in stone" really mean "unchangeable" when referring to the dates on Ellsworth's and Edith's headstones in the Grand Canyon Pioneer Cemetery?*

Though the Kolb Brothers built their Grand Canyon business on the backs of mules and received their reputation from their rivers of photographic images, the exhibit is much more than that, with topics covering the family and the community, other boating and Grand Canyon experiences, the "Grand Canyon Film Show," lectures and publications, the history of the studio cascading down over the edge and its renovation, and where to find more information about Ellsworth and Emery.

Though you will undoubtedly want to see the entire layout with artifacts, including the canoe that contained "the bones in the boathouse," until that time you may see the exhibit panels online through the Grand Canyon Association's website: <http://grandcanyon.org/kolb/currentexhibit.asp>. Also online are over 10,000 photographic images at Northern Arizona University Cline Library's Colorado Plateau Archives: <http://archive.library.nau.edu/>.

An experiential highlight of the exhibit took place on January 4th, when the Kolb family attended the grand opening reception. Emery Kolb's grandson, Emery (Sonny as a lad and Smokey in later years) Lehnert, son of Carl and Edith Kolb Lehnert, his wife Ruth, their daughter Jennifer Draper, and her daughter Kerstin Feldhaus, along with Emery and Ellsworth's youngest brother Ernest's grandson Steve and his wife Susana, attended the gathering. Emery and Ruth had not been back since after his grandfather Emery died December 11, 1976, at almost 96 years of age, the oldest resident at Grand Canyon. Smokey stated that there was nothing to come back for: his grandparents were gone, the house was empty, and the Park Service owned the house and closed it. For many years, Emery and Ellsworth Kolb had some ongoing acrimony with the Forest Service and the National Park Service concerning their business ventures. Kolb fan Brad Dimock explained: "It's an interesting thing to see the Kolb family and the Park Service on amicable terms. There used to be a three-way battle between the Kolbs, the Park Service, and the Fred Harvey Company, and it was vicious....So, it's cool to see the Kolb family come back as special guests to the park." The family was so appreciative of the efforts that the Grand Canyon Association took to stabilize and restore the house and studio and of the concern and support Grand Canyon National Park has taken for the building and the history of the Kolb Brothers. Emery and Blanche's daughter Edith eloped to Mexico to marry Park Service employee Carl Lehnert; their son Smokey also was a long-time Park Service employee.

Superintendent Dave Uberuaga and Deputy Superintendent Barclay Trimble were both on hand at the opening and hosted a luncheon for the family.

On January 5th, the Kolb family treated many of the GCNP rangers, interpreters, GCA staff, and other appreciative attendees to a get-together to share reminiscences of living at and visiting the Grand Canyon and to answer questions. At first Smokey's grandmother Blanche, Emery's wife, received only brief mention. I finally asked about her: Smokey lowered his head a bit, somewhat overcome with emotion, and softly said "she was a wonderful woman." With a little further prompting by others' questions, Emery, Ruth, and Jennifer opened up with some wonderful stories of Blanche, obviously a dear person to their lives and memories who holds a cherished place in their hearts. I always thought that it was lucky that Emery won the coin toss with Ellsworth in 1924, as "Ed's" wanderlust would probably have doomed the Kolb Brothers' business, while Emery's perseverance worked towards success. Jennifer countered with the fact that Blanche really ran the business, that it was her hard work and business acumen that was the real cause.

After all these years, there is finally an exhibit dedicated solely to the Kolb Brothers, their lives, business, and family. It will be in the Kolb Studio through September 4, and installed again in December. But please don't put it off - you owe it to yourselves, and the Kolbs, to view it, learn from it, and enjoy it.

* Ellsworth had a Chinese cook who had trouble pronouncing his name, so "Ed" it was. There is no Hopi word starting with Ch, or even C, or many other letters; Cheyava may be based on some Hopi, or perhaps other language, word that has a beginning sound similar to Ch. Ellsworth's birth date is December 27, 1876, not January 4. Edith's year of death is actually 1978, not 1979.

Postcards

I was on a Western Rig early in May with Lucky and Jonathan as crew. This was my fourth trip in as many years. Lucky was determined to show me parts of the Canyon that I had not seen on any of the other trips and I got into a lighthearted assignment of points for anything he could come up with. One night we settled in for one of those beautiful moonless canyon nights with the stars so numerous that the night sky looked like it was covered in clouds. Well, the quiet night was disrupted by a loud crash and obvious tumble of rocks off of the talus slope on the opposite side of our Research campsite. There was the splash into the river then just as quickly the night returned to perfect stillness.

The next morning at breakfast I had to tell Lucky that I really don't know how he had arranged it but surely I had to award him two points for the rock fall.

Lucky actually did show me many new adventures and later he would be lead crew on my ninth trip and while we had no night rock falls he had no difficulty showing me other corners of this incredible Canyon. Every trip I've taken has brought new adventures and every guide's respect, knowledge and love of the Canyon is remarkable. I hope to continue over the next few years to make more trips with my grandchildren so they can have the same experiences and the memories that I've had.



Cliff Bombard

Its easy to remember back to trips in the canyon:
 Magnificent night sky with little or no light pollution.
 Bats flying overhead to keep the insects at bay.
 The mixing of colors at the joining of Colorado and Little Colorado.
 The great hikes, both morning and afternoon.
 The great food.
 The whitewater, and the reverse currents in deep areas.
 The water fights with bailing buckets and fellow rafters on hot afternoons.
 The rock formations, the caves, and variety of geology.
 The ruins of ancient canyon dwellers and explorers.
 The faces and other shapes in clouds and rocks.
 The fun people in the groups, the guides and their interesting histories, and the spirit they set for the group.
 The balance of exercise, rest, reflection, food, learning, a walk with God, all make time in the canyon so special.
 I hear that lots of water has been let loose to refill Lake Mead, it would be a fun year to do the trip.
 I hope those who do get to run the canyon have wonderful times.
 From one who has had many memorable times in the canyon, both on the river and off.



Baron Battles

I knew I would love the spectacular scenery. What surprised me was how I came to cherish our nightly camping routine and the delight of sleeping out in the open. In the past, I've always been too nervous to camp without a tent. But I felt safe and peaceful as I lay down on my cot beside the river I was getting to know. I came to look forward to the new routine of turning in early as the bats emerged, falling asleep to the rush of the waters, gazing up at the Milky Way in the middle of the night, waking to watch the sun creep slowly down the cliffs, and padding barefoot through the warm sand to breakfast. There was great camaraderie not only in sharing the excitement of the rapids and the beauty of the canyon but in living this simple routine together with a group of strangers. It left me grateful for the simple things in life and for the privilege of spending a week in this place.



Susan Auerbach
 Pasadena, California

My best memory is a story that one guide, named Tyler, told me. It goes something like this:

In millions of years, intelligent beings will roam the earth. They will be somewhat like us, and visit the planet for pleasure. In the Grand Canyon, a pup asks his guide:
 "Hey, what is that black line in the rock?"
 And the guide answers, full of panic:
 "DON'T TOUCH THAT, IT'S RADIOACTIVE AND DANGEROUS! THAT LINE MARKS THE TIME OF HUMANITY!"

The story ends there, as it was told to me, but I have to add more.

The guide says: "We do not know whether they truly were intelligent beings, because they destroyed their ecosystems and their living habitats without any reason. Some say it was a big accident, others say they were too greedy and let it happen. There is evidence of multiple accidents, but they seem to have never learned anything from it."



Vincent Laberge

TRAVERTINE CANYON, LOOKING UPSTREAM --PHOTO BY CHRISTY SCHENCK

The Best Idea

by Lew Steiger

Our National Parks are a truly great concept when you think about it. I never did much, despite growing up right here (as a professional boatman) in one of the best National Parks ever. What came to mind on those rare occasions for me was Teddy Roosevelt sitting around a campfire with a bunch of cronies in 19th century Yellowstone under a vast and starry sky, dreaming the whole thing up more or less all at once, as the low flames softly danced and crackled and the horses stirred contentedly in the background. John Muir, out in California, entered into it too somehow, but how it all tied together was a little fuzzy.

The PBS documentary series by Ken Burns "The National Parks—America's Best Idea" (and particularly the companion book to it) was a huge eye-opener.

In a nutshell the saga that unfolds there is one in which the National Park system we know and appreciate today has been brought about through a never-ending series of, basically, pitched battles fought over the ages by a host of dedicated individuals who fell in love personally with these places one by one and gave of themselves—sometimes to astonishing degrees—to see each park protected and set aside... for all mankind, yes—but also for the sake of each place itself. John Muir, who entered the story as a logger in Yosemite, was a key figure, but the list of real heroes involved with the Parks in general is a long one, including wealthy and extremely successful businessmen like Stephen Mather, who teamed up with a Berkeley lawyer, Horace Albright, in 1914 to really get the thing off the ground; and many, many others.

This rumination here ends up, I promise, directly in the wheelhouse of anyone who cares enough to be a member of the Grand Canyon River Runners Association, or to read this publication. But it started for me a couple months ago, as the deadline approached for comments on the upcoming Glen Canyon Dam Long-Term Experimental and Management Plan EIS (LTEMP).

A stakeholder work group meets regularly to keep tabs on Dam Operations and to help make the big decisions thereof; and this new EIS, led jointly by the NPS and the Bureau of Reclamation, will determine the fate of the river and its riparian zone for the next 20 years. If we get it wrong,

in 20 years' time we'll have lost so much it probably won't matter after that. We won't have anywhere to camp and the riparian zone will just be rocks.

It was work to even think about Dam Operations yet again, especially since the issues at hand have been in play—and the competing interests of water, power, and long term care of the Canyon have often been at odds with each other—ever since Glen Canyon Dam was finished in 1963. But I was proud of the joint statement submitted by GCRRA, GCRG (Grand Canyon River Guides) and other organizations; and I was really proud of the more detailed response by GCRG alone, wherein they contrasted the mission statement of the proposed new EIS with the actual language of the 1992 Grand Canyon Protection Act. Long story there, but the short version is: the new statement of purpose A.) waters down the specific intent of the Grand Canyon Protection Act and B.) slips in a couple of friendly references to the economics of hydropower where before, markedly and deliberately, no such words existed. No surprise there—hydropower is where the money is, and the lawyers and other experts representing those interests get paid hundreds of dollars an hour to be there at the workgroups and at every single step of the way throughout the process. They don't dislike the Canyon, but human nature is what it is.

The fun part for me in having to think about all that stuff yet again is it reminded me of two genuine heroes I was privileged to know who really made a mark in Grand Canyon, each in their own way, before they died. Kenton Grua and Tom Moody each had the help of a gazillion others with the great things they did for Grand Canyon, but by and large they were the only ones alive who could have done the things they did when they did them.

Grand Canyon River Guides will be 25 years old next year. It was started by Kenton Grua in the dawning months of 1988 and nobody else but Kenton could've ever got it going in the first place (or even wanted to). Getting a bunch of river guides together on anything has always been like herding cats. Kenton was a little guy, but he had a fierce intensity that bordered on the maniacal. He knew he was going to be a boatman for life after the very first river trip he ever



KENTON GRUA PHOTO COURTESY OF MICHELLE GRUA

did, with Hatch Expeditions up in Utah at age 14 (on which a boatman named Shorty Burton taught Kenton how to bake biscuits in a dutch oven). Kenton motored for Hatch, then Grand Canyon Expeditions, before he switched over to rowing plywood dories for Martin Litton. Unlike any other boatman I've ever known, Kenton knew for a fact that being a river guide in Grand Canyon was his life's work—hook line and sinker, until the day he died. He drew everybody together through sheer force of will, coupled with his egalitarian background, and seasoned by the community's grudging respect for things he'd done earlier: the world speed record through the Canyon (in a dory in 1983 on 72,000 cfs) and an incredible hike he'd made before that, all the way through the Canyon, from Lee's Ferry to the Grand Wash Cliffs.

The other thing that drew everybody together was the need. Those who had really known the Canyon well since the time of the dam (boatmen who worked down there regularly) were stunned by the changes we saw in just 20 or 30 years. The beaches were leaving. Meanwhile the dam itself, along with the politics of water and the economics of hydropower, had combined to encourage the worst possible flow regime for the long term health of those beaches. Kenton's premise for Grand Canyon River Guides was that those who lived on the river and knew it best needed to stand up for it and be a voice at the tables where management actions that affected it were considered. His two great gifts to the river we know today were starting that organization in the first place and then about 3 years later realizing (before anyone else did) that it was time for him to step down as President and give that job over to someone who could take it to another level.

It was funny watching it evolve. The first big meeting Kenton went to as the new President of the new organization, he stood up in a roomful of engineers, scientists, lawyers and bureaucrats. He said a lot of really good stuff about the river at the time and no one paid him any mind at all. He had long hair and a beard. He looked like Ed Abbey's Hayduke from "The Monkey Wrench Gang." Next meeting, a couple weeks later, Kenton got up there again and said exactly the same things he'd said before. Suddenly people were falling all over themselves taking note of his wisdom and experience. Kenton was clean-shaven and had gotten a buzz-cut. (He was pretty handsome without all that hair.) That little subterfuge worked for a while but Kenton had an intensity he couldn't disguise and finally he realized it was working against the things he really wanted to get done.

Tom Moody was there (2 or 3 years into the life of the organization) the night Kenton announced to the GCRG board of directors that it was time for him to step down as President if only we could find the right replacement who would actually consent to doing it. Tom thought he might be able to



TOM MOODY PHOTO COURTESY OF LEW STIEGER

do it and everyone else knew, instantly, that he'd be perfect. And he was, too.

Tom had a perennially sunny disposition and a non-judgmental temperament along with the native intelligence and the training (he was studying to be a civil engineer) that lent themselves perfectly to the task at hand. He also had a vision. It had come to him years before, sitting around a campfire at night on a winter Grand Canyon trip with a group of college girls from Middlebury, Vermont, on a field seminar taught by a sedimentologist named Jack Schmidt. What the Canyon needed, they decided after scratching their heads over the fate of the beaches, was a law.

They called it then "the beach bill."

When Tom took on the Presidency of Grand Canyon River Guides (about 7 years after that campfire epiphany) he didn't flap his arms and shout from the rooftops that we now had to have this thing, he simply projected his innate optimism outward to everyone he encountered. He encouraged... everyone he met, really, to just do the things they personally did best and to do the right thing for the Grand Canyon too. He went to Washington, D.C. with that same attitude when the time came, and, lo and behold, California Congressman George Miller (with a lot of help from his aide Steve Lanich) and Massachusetts Senator Bill Bradley (ditto from Bradley's aide Dan Beard) wrote and sponsored a bill that was passed into law, which became known as the Grand Canyon Protection Act.

The great gift that Tom Moody gave to the Grand Canyon, and to everybody involved in a personal sense was—he came back in order to do this thing. He had grown up in the Grand Canyon, been a boatman, later became an outfitter of sorts, then moved on to other things: flying, commercial fishing in Alaska, international boating, engineering, family most of all. But he took a huge time-out personally and came back for several years for the sole purpose of giving something back to the Grand Canyon after all that it had given to him. He didn't do it all alone, by any means. There were lots of people and other organizations involved in a huge effort put forth by a great many people. But Tom was, if you will, a spiritual leader in the thing.

How has it gone in the 20 years since the Act was passed? We, meaning all involved (and particularly the Bureau of Reclamation), have tried really hard to do the right thing and take care of the Canyon. Thanks to good science and a humongous effort over the years, the beach-building flows we count on for sand down there have gotten exponentially better. But often the politics of water, which supersede all else, have undermined those efforts (see: beach erosion in 2011). The native fishes and endangered species are hanging in there for the moment, but that stuff is complicated. Archaeology seems to have gone well, but that depends on who you talk to. In short, as with our democracy as a whole, we have won a few and lost a few too. The forces affecting these things are relentless.

Where does the GCRRA enter into all this? Why should anyone reading this

publication care? Because right here, in the hearts and hands (and voices) of the average commercial river runner in Grand Canyon, is where the last best hope for the Grand Canyon always has been and always will be. Grand Canyon River Guides never did have (and never will have) any real political clout at all. We have some good ideas every now and again, and we see what is really happening on the river, but our power, all along, has always stemmed solely from the fact that we were able to hold our customers captive long enough to convince them to write or call their congressmen and senators about the Grand Canyon. The initial attention to Glen Canyon Dam and the entire decade-long process that led ultimately to the Grand Canyon Protection Act 20 years ago came about directly because of (and only because of) the cards and letters and phone calls of concerned constituents all across America. The defense of the Grand Canyon Protection Act, and the Canyon itself, in the months and years ahead will too.

It won't take much on your part. If your river trip(s) gave you something, all you have to do to reciprocate is write a letter saying so to your legislators and to the NPS. It could probably be the same letter sent to all of them. Just tell them you've been there and it mattered to you personally. You care and you want them to do the right thing for the Canyon. You're watching them.

If you really delve into the "The National Parks..." and the history told there, you will see that same theme repeated, time and again all across America.

This will be Lew's 40th year working in Grand Canyon. He'll run trips, proudly and gratefully, for Grand Canyon Expeditions, OARS/Dories, and Arizona River Runners. Tom Moody was a boatman on Lew's first trip ever.



LEW STEIGER PHOTO COURTESY OF ALAN GILBERG

Too Much Sun

by Chelsea Taylor

The greatest man I have and possibly ever will work for tossed me one of the most enlightening nuggets of wisdom as pertains to human vanities I might ever get: "From birth until mid-twenties, you care desperately about what everyone thinks of you. From your mid-twenties until fifties you desperately don't care what anyone thinks



ELVES CHASM © CHELSEA TAYLOR

of you. From fifties on, you realize no one was thinking of you in the first place." If I was feeling slightly more sentimental, I would tell you he bestowed to me that adage on my birthday at Fat City Camp after I had scraped over the cheese grater rock and almost lost the only passenger that had been brave enough to ride with me in the worst run through Lava Falls rapid I hope (against hope) to ever have. We sat together on my boat listening to Erica and Walt belt out Fire on the Mountain upstairs, me on the verge of trying not to blubber in front of Bill Gloeckler and, thereby, give away the fast apparent FACT that I was not cut out for this. Truth be told, the only thing he said to me on my 18 foot Avon that night was, "What the hell happened at Lava today?" I explained, he exited, and I sniffled myself to sleep wondering if my old bartending boss in San Francisco would hire me back on short notice.

It was the next day, celebrating the warm weather in October and enjoying a beer (or maybe three), chatting about nothing in particular with no significance whatsoever, when the Midas Gold popped out

of Gloeckler's mouth, knocked me right on my nose, and changed my view of the Grand Canyon and humanity within it forever. Well, not forever. That's the point I would like to make.

What hooked me on my first trip through the Grand Canyon was not the beauty—there's too much to untangle the first few days of a trip before you develop an eye for it—nor the geologic implications of the fluidity of space, time and matter. A nineteen-year old girl from Los Angeles couldn't possibly comprehend that, nor the thrill of the rapids—terrifying! What reeled me in was the unavoidable heat, and the ungrudging acceptance of it the group adopted. I had never spent much time out of temperature-controlled climates, and giving in to such obvious discomfort without complaining about it was a new and freeing philosophy. After all, we were all experiencing the same thing. Taking my boatman's lead, I decided to not take the 120 degree offense personally, and started sliding down a slippery rabbit hole into a new world where I was no longer the center, axis, and jeweled possession.

I won't go into the beauty of the Grand Canyon because many have explained it with more color and eloquence than I could ever hope to express. But I will say this, and mean it: the Grand Canyon is BIG. Big place, big weather, big geology, big time. Staggeringly big. Stephen Hawking big. Incomprehensibly big, which is why I think it will always draw scientists and artists alike who must comprehend it. Dinosaurs weren't even a glimmer in evolution's eye when the youngest layer within the canyon, the Kaibab Formation, was hardened. The canyon itself was formed twice again as long ago as the first homo sapiens appeared. I've heard it speculated that it took roughly 4,000 years to form each inch in the towering 500 foot cliffs of the Redwall Limestone. Come on—that's fourth dimension Big. More importantly though, maybe more so than it is big, we are just so so so small. It's only big because we say so, and who are we?

As I rack up more years as a guide for Arizona River Runners and Grand Canyon White Water, I am finally starting to understand what 250,000,000 years, the age of the youngest layer in the Grand Canyon, means. It means that evolution's greatest trick on the human race was to bestow us with a notion that we are significant in the grand scheme of things. Heat, Lava Falls rapid, 18 foot Avons, good bosses, Los Angeles, ALL fleeting. Not that they are not important and very real in my own little "desperately don't care what anyone thinks" space-time continuum. I won't be presumptuous enough to imply that I more so than any other human have transcended my biological and hormonal make-up to an enlightened, unaffected plan such as that. But I do think that spending copious amounts of time in the canyon tweaks one's perception processes. ("Which canyon?" one of my close friends always asks ironically, implying that Grand Canyon guides suffer from an elitism similar to San Francisco's "the City" locals). A general though not completely universal pattern has appeared to me as I've befriended and slyly studied the guides I have been privileged enough to spend arguably too much time and too little sleep with.

I have noticed that newbie swampers, armed with knowledge from this geologic book and that historical canon about Powell read

over the winter, tend to turn the Grand Canyon into a clinical, chewable, fragmented case study. A few years down the road in the realm I now occupy, the Grand Canyon evolves into a cohesive idea more so than a collection of facts. Even further down, say a couple decades, the Grand Canyon turns fickle lover. A female lover for that matter, since the majority of those boatmen tend to be men. And once you get into triple and quadruple decades like one of my favorite people to row with, veteran boatman and story teller extraordinaire Jimmy Hendrick, everything is just funny. I like this progression.

It seems that our continual proximity to the notion of the Grand Canyon's seeming infiniteness coupled with our developing awareness of our own mortality warps the brain a little. At first, like children, we want to understand it all, and right away. It is very important that everyone we know knows how much we know. As we relax a little and escape just enough carnage to finally be able to sleep through the night, we start to take ourselves out of the equation and live through the enjoyment and discoveries our passengers reap for their first times, while relishing the fact that the canyon is so much greater than all of us. Then, as we live through more and more carnage, seeing good friends and role models drop off but somehow luck out enough to stay in the game ourselves, we start morphing the canyon into a goddess-like entity/consort that will continue to allow us through if only we can keep saying the right words and refrain from hubris. "She loves us in Her way." How generous of Her. The fortunate few, whose dedication to the place outlives most men's dedication to their wives, have a common Buddha-like sense of humor, and quite a healthy dose of crazy to boot. An acceptance of impending death, because statistically speaking, they should have been dead long ago.

Finally, "Nature wasn't thinking about you in the first place."

All just thoughts from a still-novice city girl turned river guide with too much time during the off season to overanalyze people who deserve more from her. There really might be something to it though—maybe obscene amounts of time spent in the Grand Canyon could be just what our society needs to pull our collective head out of our collective arse and stop taking this life so seriously. We will all be dust before "She" even notices we've been here, after all. Or maybe we're just getting too much sun down there.

In 2002 I discovered the Grand Canyon as a passenger with my mom on a 13 day row trip, and spent the next five years elbowing my way—WFR, CPR, and Back Country Food Handler's license in hand—back into the most majestic ditch in the world. Since 2008, I have been blessed with the best job a city girl could dream for herself. I hope to spend the rest of my life learning more about the canyon, and sharing our little world with people just as excited about it as we are.

PHOTO COURTESY CHELSEA TAYLOR



Into the Canyon, Time, and Silence

by Ivo Lucchitta



PHOTOS COURTESY IVO LUCCHITTA

After 50 years—half a century—of being in, around, through and over the Grand Canyon, some of my boatman friends still do not view me as a proper river person, and I agree with them. To be one of that tribe, it is essential to take the keenest interest in rapids and currents, and certainly in negotiating them with greatest skill; one must know about the quality of the camps and one must rejoice in getting a good camp even in the face of heavy competition; one must be prepared to convey groups of passengers through all those river miles, catering to their needs and their safety, showing them special places, and then basking in their admiration as superwoman or superman. The experience fundamentally is that of a small cohesive group of nomads traveling through the wilderness, prepared to deal with whatever may come, as our hunter-gatherer ancestors did for thousands of years. It is a dynamic and social experience that reminds me of Siegfried's Rhine Journey described musically by Wagner when, young and strong and innocent, Siegfried set off down the river looking for adventure and for tests of his strength and skill (less so of his knowledge and wisdom). Above all, perhaps, being a boatman implies being a part of the tribe and delighting in that select membership.

My take is altogether different. Not better or worse, mind you, just different. It is not a matter of fearing rapids, for I have rowed my share of them in the West; it is not a matter of disliking traveling in groups, for I have led many over the decades; nor is it a matter of not appreciating the river people, for in my opinion there are none finer, representing as they do the qualities that are so badly needed in our country at this time, but are in such scarce supply. No, the issue is something quite different, and I will let the shoe drop right now: for me, it really would not make that much difference if there were no rapids at all in the Canyon, though of course I will always appreciate

fast water as opposed to the slack water that invariably brings forth headwinds. So, there it is, unthinkable and awful. Really, what is the matter with this guy?

The matter with this guy is that, for me, the Canyon lives most strongly in other things.

I love the sound of the river, from the silvery sparkle of shallow water making its way over gravel bars to the ominous sound, in the bass register, of the rapids.

I love the smell of the river, a rich compound of vegetation, clay, and the unmistakable perfume of desert water.

I love the returning swallows weaving spring into the air, and the canyon wren issuing his shrill descending cascade that bounces from one rock wall to another.

I love the redbud's sprays of purple set off strangely against the red-brown or gray of the cliffs behind.

I love the secret red light in the canyons that becomes redder downwards with each reflection off the walls.

I love the coals-red light of sunset or dawn creeping along the cliff faces, and the stark, pale, almost unbearable light of the moon doing the same thing in obverse fashion at night.

I love the constellations that, so bright when seen from that narrow slot, coyly reveal themselves only at the last moment, when the key star emerges from behind the cliffs.

All these are things that boatmen are not insensitive to, of course. Perhaps it is a matter of degree. But there are things that really are the special domain of the field geologist, a person who goes everywhere in the course of studying and mapping, who goes to places that no one else visits because they are not interesting or challenging enough, and to other places that perhaps are too challenging for most but still must be inspected and recorded. In doing this, the geologist

becomes suspended in time, which appears as a stately mental movie in which the present state is merely one of a long sequence of frames. Thus, for example, I often envision a Canyon quite thickly populated by prehistoric farmers, with fields and dwellings scattered about, with irrigation ditches sparkling in the sun, with wisps of smoke rising here and there into the morning air. Or I journey farther back in time, to one of the ice ages, when the Canyon looked quite different from its present stark self, being thickly mantled by forests of conifers and deciduous trees, much like today's Canyon de Ordesa in the Spanish side of the Pyrenees in Aragon. Above all, I see the great river relentlessly cutting down, leaving behind as testimony terraces that are tens or hundreds of feet above the present river, mute evidence to its endless, ferocious power.

More than anything else, field geology is an activity that is wrapped in solitude and silence because only in solitude and silence can one hear the stories of the Earth. Therefore, I am comfortable with and love

The solitude that sharpens the senses and nourishes the soul.

The silence so unbroken that even the faint whispers of Gaea, Earth, can be heard from time to time.

The dialog with the Ancient Ones, whose playful children left improbable stones on top of huge rocks near Comanche Creek for me to find eight hundred years later.

The ancient trails in places where we moderns do not walk but the geologist does and the Ancients did, still visible today to those who have eyes to see them, and identified as ancient by the scatter of potsherds.

The little ditch, still faintly visible today, as are the associated farming terraces, that starts at Kwagunt Creek (then 30 feet higher than today) and winds its way in and out of gullies and ridges, with perfect ditch gradient, to a cluster of dwellings where people lived, grew vegetables, and enjoyed the great view so many centuries ago.

The now-arid and improbable-looking flat ground near Comanche Creek where charcoal layers show that this was a field where prehistoric farmers were growing corn even before the great Pharaoh Ramses II ruled Egypt, or Tutankhamen, or Akhenaton, he who worshipped the sun as we in the Southwest worship the sun; before the Israelites led by Moses left Egypt; and when the sack and burning of bronze-age Troy described by Homer were still far in the future.

The strand lines that mark ancient, mostly pre-dam, floods of the river, and show how the river functioned in the days before it was importuned by Glen Canyon Dam. These strand lines are fun to study

because they tell so much about what was going on in the region. The great flood of 1884, estimated at 300,000 cu.ft./sec., left huge trees and almost no artifacts excepting a few mine timbers; the 1921 flood also left large trees, and quite a few artifacts, but no beer cans or plastic objects; the bigger floods going back to shortly before the dam was completed reached about 125,000 cu. ft./sec., and include decent trees and lots of artifacts, including steel beer cans of the kind that you had to open with a church key, but very few plastic objects; the 1983 flood, when the dam almost failed, only left small wood because trees were captured by Lake Powell, but the artifacts are very numerous and include aluminum beer cans and abundant plastic containers.

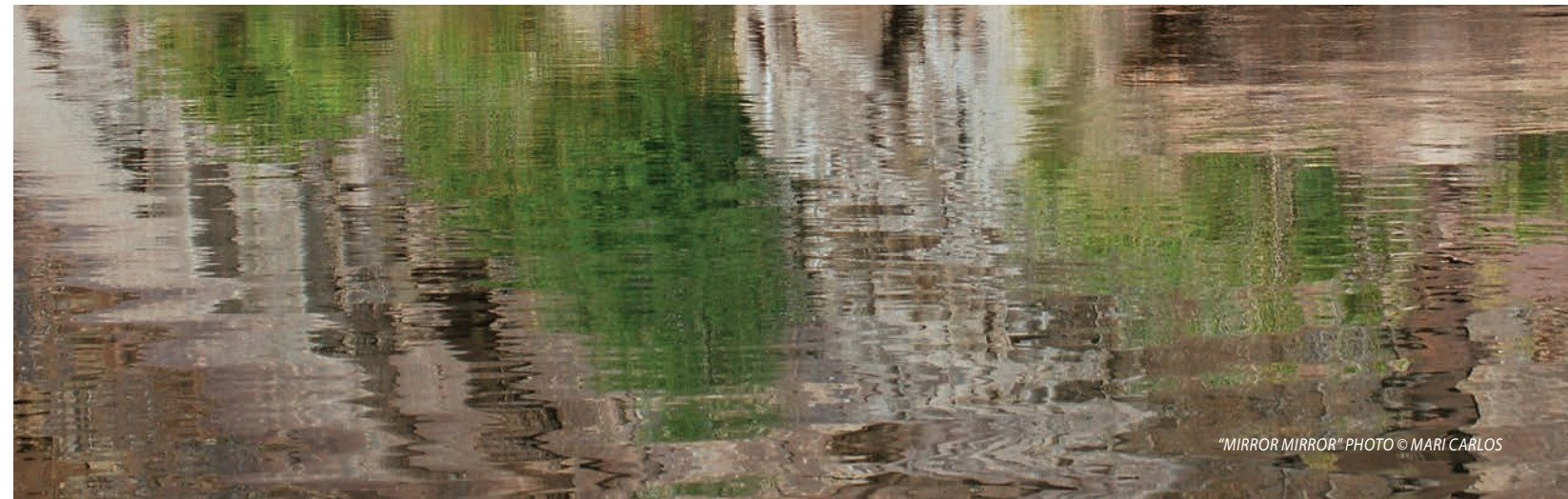
I could go on and on about the many interesting things that have been learned, but this is not the place to do so. Instead, I'd like to finish by mentioning how the gods of the Canyon showed me that they do appreciate silent unobtrusive interest and reverence.

On the last day of my last research trip we were camped at Tanner Beach. In addition to us geologists, Ann Zwinger was there, I think; Raechel Running definitely was, acting as camp cook, La Cocinera. The weather was bad and a restless wind played fitfully with the sand. Gray turbulent clouds, mists and curtains of rain swirled around the Palisades and Comanche Point. It was not a heart-warming scene. Then, suddenly, the setting sun emerged from below the edge of the clouds far to the West, and the world was transformed. The angry swirls became an amazing play of colors—purple, orange, electric blue, gray blue, yellow, restless, always moving, constantly changing. In between, the great cliffs shone through in places, the color of live coals. There was no question of trying to photograph any of this—it would have been a sacrilege. The task was to see, to absorb, to remember, indelibly and forever. Absorb and remember I did then, and remember I do to this day.

The gods had spoken, telling me that the solitary, silent and respectful geologist, the wanderer, was also a member in good standing of the Grand Canyon People.

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Ivo Lucchitta, Scientist Emeritus with the U.S. Geological Survey and Research Associate with the Museum of Northern Arizona, has spent 50 years doing research and generally rummaging around the Grand Canyon. His first river trip into the (western) Grand Canyon was in 1962, with Bill Belknap and Dock Marston.



"MIRROR MIRROR" PHOTO © MARI CARLOS



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Have you experienced a fantastic commercially outfitted trip down the Colorado River? Are you planning to have one in the future? Do you think that the opportunity to see Grand Canyon from river level should be available to everyone, even if they do not have the skill or strength to row their own boat? Did you know that the Park Service can change its management plan, including adjusting the number of visitors and kinds of trips permitted, from time to time? If you care about these issues, GCRRA speaks for you, with the Park Service and in the courts, helping preserve your opportunities to participate in a commercially outfitted river trip. Have your voice heard! Join us today! Use the membership reply envelope included with this issue, or log on to our website : www.gcriverrunners.org to learn more. We have an online interactive membership form and can accept PAYPAL for your convenience.

Membership includes half-yearly issues of the beautiful Grand Canyon River Runner newsletter. GCRRA is a 501(c)3 organization that has donated a portion of membership dues to Grand Canyon related causes, over \$12,500 through December, 2011.

CALLING ALL RIVER RUNNERS!

YOUR LITERARY AND ARISTIC CONTRIBUTIONS CAN BE SHOWCASED IN THE NEXT GCRRA NEWSLETTER

Send us your journal entries, poetry, postcards from the canyon, humorous stories, photos, and original art work for publication in the next newsletter or on the GCRRA website. Electronic submissions are preferred. EMAIL materials to : gcriverrunners@gmail.com Technology challenged? Mail your contributions to : GCRRA, P.O. 20013, Sedona, AZ 86341-20013.

If you need more information your question will be routed to the Editor.

Submission deadline for the WINTER Issue is SEPT. 1, 2012.

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