

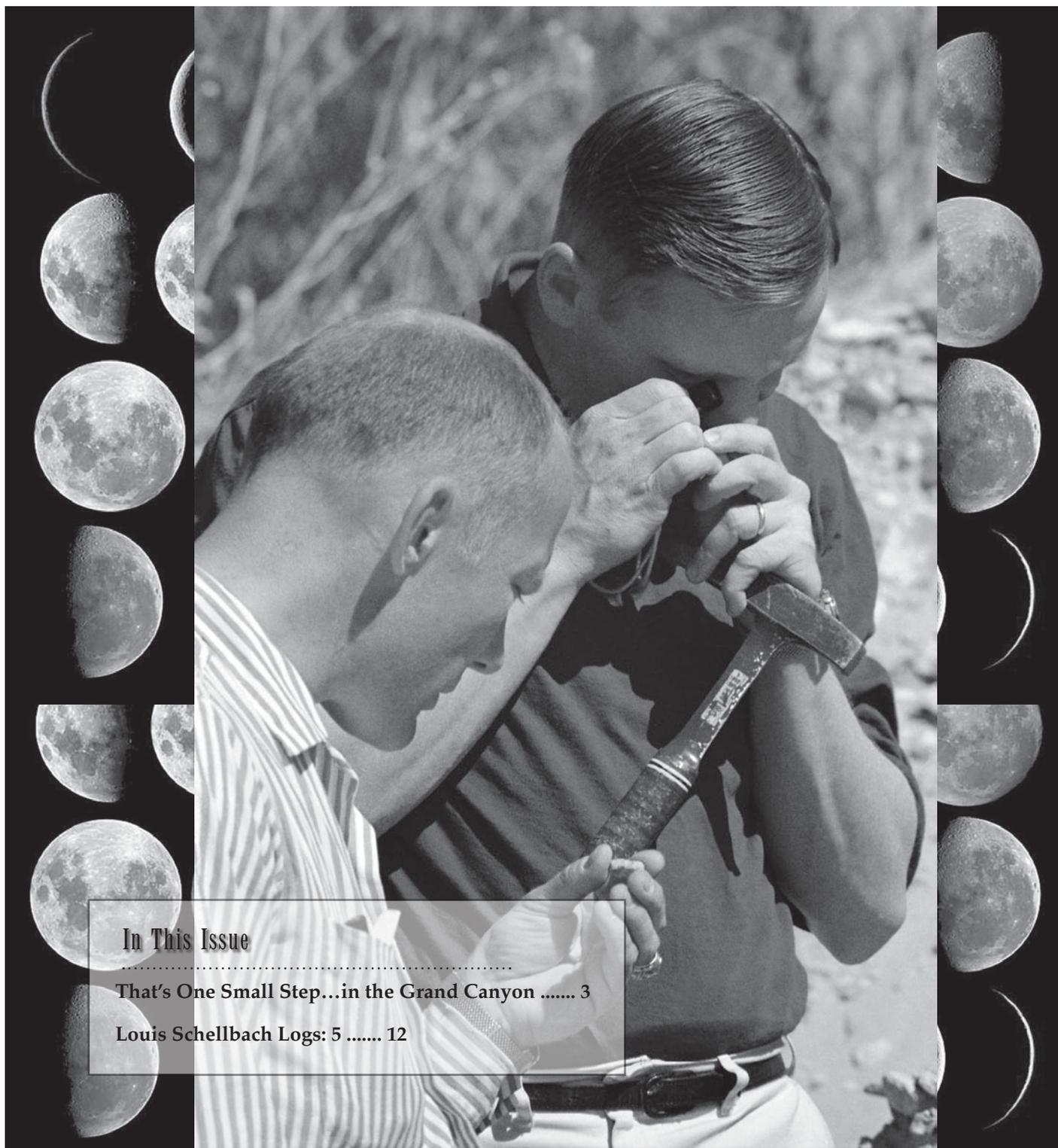
The Ol' Pioneer

The Magazine of the Grand Canyon Historical Society

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In This Issue

.....
That's One Small Step...in the Grand Canyon 3

Louis Schellbach Logs: 5 12

President's Letter

It was great seeing everybody at the rim in January for the third Grand Canyon History Symposium! It was a truly wonderful event. Each day, the program (and the auditorium) was packed with interesting presentations that covered everything from rim to river and the ancient past to fairly recent events. And when the presentations were not in session, there was a constant swirling of shared ideas, passionate debate, story swapping, the renewal of old friendships and the formation of new ones. As a long-time reader and researcher of canyon history, it was amazing to see so many well-known and respected writers, historians, and canyon residents all gathered together under one roof – a historic event in its own right.

I have said it before, but I want to say it one last time... this symposium could not have been done without a tremendous amount of passion, enthusiasm, resources, brain power and elbow grease from the numerous volunteers. The symposium was planned, coordinated, and operated entirely by volunteers many of whom probably put in well over a hundred hours apiece over the last year. Even now with the symposium completed, work is still continuing on a symposium proceedings publication which should be out by the end of the year. The symposium also could not have been done without the excellent cooperation of the society's partners who contributed people, expertise and resources – notably the Grand Canyon Association, Grand Canyon National Park, Xanterra South Rim, Xanterra Grand Canyon Railway and Northern Arizona University Cline Library Special Collections. And lastly, I would like to thank those people whose generous donations to the symposium helped fund the numerous starting and material expenses that would have proven very challenging otherwise. To all of you, I would like to say a big THANK YOU.

I would also like to extend a warm welcome to our new members (we picked up quite a few during and after the symposium). I think you will find that the society embodies much of the same passion for canyon history, opportunities for learning and sharing, and informal camaraderie that marked the symposium. I would strongly recommend that you check out our society website (<http://www.grandcanyonhistory.org/index.html>) where you will find useful information about the society, events and outings, and back issues of the *Ol' Pioneer*. Be sure to mark the annual Shoshone Point picnic on your calendars for July and browse the awesome new official society t-shirts and other GCHS gear featuring the logos designed by James Hayford (you can reach the society store through the 'Shop' link on the website). As always, I welcome suggestions and comments from old and new members alike.

Erik Berg
GCHS President

COVER: Buzz Aldrin and Neil Armstrong during geological training in West Texas near the ruins of Fort Quitman, February 24, 1969. Photograph courtesy of the National Aeronautics and Space Administration

The Ol' Pioneer submission deadlines are going to be roughly January 1, April 1, July 1, and October 1 and we will publish either three or four issues a year, depending on content volume.

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That's One Small Step...in the Grand Canyon

by Don Lago

When Neil Armstrong climbed down the ladder of the *Eagle* and took the first human footsteps on the moon, his footstep contained thousands of footsteps he had taken into the Grand Canyon. When Armstrong picked up the first moon rock, he saw it with insights he had picked up in the Grand Canyon.

Five years previously, in March 1964, the crew of Apollo 11—Neil Armstrong, Buzz Aldrin, and Michael Collins—had spent two days hiking to the bottom of the Grand Canyon and back up. They were part of the first of three groups of astronauts to make this hike. All but one of the twenty-four astronauts who journeyed to the moon hiked into the canyon.

The March 1964 hike into the Grand Canyon was the first event in a new NASA program to train the astronauts in geology. This hike also served a larger purpose: to inspire the astronauts to take an interest in geology. When the astronauts were first told that they would need to study geology, many were openly hostile to the idea.

When President John F. Kennedy stood before a joint session of Congress on May 25, 1961 and committed the nation to going to the moon, Kennedy did not say anything about going to the moon to study geology. Everyone understood that Americans were going to the moon as an assertion of national pride. American national pride had been deeply wounded by the Soviet launch of Sputnik in 1957, and it was wounded anew when the Soviets launched the first human into space on April 12, 1961. A central element of American national identity was that Americans were superior at exploration and technology. Americans had long offered their technological superiority as proof of the superiority of their democratic system. By this standard, the Soviets

now had the right to claim that their system was superior. Kennedy's speech, delivered only six weeks after Yuri Gagarin's flight, placed the moon goal almost entirely within the context of proving national superiority: "If we are to win the battle that is going on around the world between freedom and tyranny, if we are to win the battle for men's minds, the dramatic achievements in space which occurred in recent weeks should have made clear to us all, as did the Sputnik in 1957, the impact of this adventure on the minds of men everywhere who are attempting to make a determination of which road they should take." After Kennedy announced the goal of "landing a man on the Moon and returning him safely to the Earth," his next line was "No single space project in this period will be more impressive to mankind..."¹

Privately, Kennedy had been alarmed by the audacity of such a goal, and he'd asked his advisors if there were some other—and cheaper—technological goal at which the United States might prove its superiority. No one could assure Kennedy that a moon landing was even possible. But the moon goal did appeal to Kennedy's personal taste for adventure and bravado; five years later this bravado would lead Kennedy's brother, Senator Robert Kennedy, to ignore the strong warnings of his raft guide and jump into the Colorado River in the Grand Canyon and swim through a dangerous rapid. And President Kennedy did recognize the importance of exploration and the frontier in the American psyche. He called his administration "the New Frontier," which invoked the glamour of the space frontier. After citing how the moon goal would be "more impressive to mankind," Kennedy added that it was also "more important for the long-range exploration of space." But in the American psyche, exploration was more about national destiny than science.

The military pilots who responded to America's call for astronauts readily felt the importance of national pride and technological superiority and exploring frontiers. They did not feel the call of geology. The astronauts were the knights of the Right Stuff, the daring masters of the most roaring, soaring, cutting-edge technology. Collecting rocks was for nerds.

Besides, in the first years of America's space program, the astronauts were seriously preoccupied with matters of life and death. The astronauts needed to learn how to fly new, complicated, dangerous spacecraft, how to respond to a thousand emergencies that could ruin a mission or kill them. The astronauts had to train for survival in case their capsules crashed in remote deserts or jungles or seas. The astronauts were also assigned duties to help design and test spacecraft and other equipment. The astronauts didn't have enough time for life-or-death training. Knowing about the origin or mineral composition of moon rocks wouldn't help astronauts land on moon rocks.

While the astronauts were preoccupied with the piloting challenge, much of the rest of NASA viewed the Apollo program as an engineering challenge. Tens of thousands of engineers, under high pressure from deadlines and budgets, had to come up with new ideas and materials and designs, test them, and redesign them. Hundreds of thousands of components had to be integrated perfectly, and any one component might trigger the difference between success or failure, life or death. For the engineers the whole point of Apollo was to build a successful machine. The astronauts were there to prove that it was a successful machine. It hardly mattered what the astronauts did when they got to the moon. The first designs for the Apollo spacecraft made no allowances for space or weight for taking scientific instruments to the moon or for bringing moon rocks

back to Earth. It was nearly a year after President Kennedy's speech that NASA convened a meeting to consider what kind of science the astronauts should do on the moon.

For geologists, Apollo would be one of the greatest opportunities in the history of science. For ages humans had wondered about the moon, and now they would finally have a chance to examine it. For decades scientists had debated what the moon was made of and how it had formed. They had debated what the moon said about the formation of Earth and the solar system. They had debated whether lunar craters were formed by volcanic eruptions or by asteroid impacts. Yet many other scientists felt that the geologists and their moon theories were presumptuous, for the moon did not belong to the realm of Geo, it belonged to the realm of astronomy, which couldn't determine much about distant rocks.

Even after President Kennedy pushed human hands towards the moon, geologists remained a small and relatively powerless part of the Apollo program. They had to push hard and long to get geology taken seriously, to obtain NASA funding and facilities and astronaut time and engineering planning. At least it seemed obvious that after all the effort and money spent to get astronauts to the moon, they shouldn't leave without taking a look around. And geology could turn out to be a matter of life or death. Cornell University astronomer Thomas Gold had theorized that the lunar surface consisted of a thick layer of fluffy dust, into which a landing spacecraft might sink and disappear. Other scientists wondered if the lunar dust might prove explosive when exposed to oxygen from the lunar lander. Few geologists took these ideas seriously, but NASA couldn't afford to ignore such possibilities.

It was October 1963 before NASA made an official commitment to include geology on Apollo, but still there were no promises about what this would involve.

NASA assigned the U. S. Geological Survey (USGS) the job of training the

astronauts in geology. At first this was mainly classroom lectures, fifty-eight hours of lectures. The astronauts became restless, partly because they were busy training for the Gemini program, which would not go to the moon. Yet the geologists had already discovered that the astronauts became much more interested in geology if it was taught in the real world.

In January 1963 geologist Eugene Shoemaker had made a trial run at geology training by taking nine astronauts—including Neil Armstrong—to Meteor Crater in northern Arizona. It had been only two years since Shoemaker and his colleagues had proven that Meteor Crater was indeed a meteor crater, formed by a cosmic impact and not by volcanic action. Meteor Crater was the best-preserved impact crater on Earth, and a natural classroom for showing the astronauts the craters they would encounter on the moon. A few dozen miles west of Meteor Crater was a volcanic range that included 600 dead volcanoes of various kinds, and they offered a natural classroom for the volcanic features on the moon. In the center of this volcanic range was the town of Flagstaff, where Lowell Observatory, proud of its discovery of Pluto, had spent decades studying the planets and moons while most other astronomers had been preoccupied with stars and cosmology. An hour north of Flagstaff was the Grand Canyon, the best display of sedimentary strata on Earth. Shoemaker was in charge of the Apollo geology program and decided to base it in Flagstaff, mainly because of all the nearby assets for hands-on preparation for the moon. Shoemaker had many other responsibilities, including preparing maps and tools and cameras and surface instruments for the moon, and planning and supervising the actual lunar field work, so Shoemaker turned over most of the astronaut training to other geologists. He placed in charge Dale Jackson, a former U. S. marine and veteran of the battle of Iwo Jima, whom Shoemaker hoped would hit it off with the astronauts, knock the right

stuffiness out of them, and cure them of their stereotypes that geologists were nerds.

The geologists decided to kick off their astronaut training with a hike into the Grand Canyon. The Grand Canyon could teach some of the basic principles of geology, especially stratigraphy, the idea that older rocks are lower down. The canyon could teach that erosion and faulting could alter original, orderly strata. The canyon contained all the basic types of rocks. The canyon could teach geological map reading, high-altitude photograph recognition, and long-distance descriptive accuracy. This latter skill became more important as the Apollo missions went on, as they went from landing in the blandest landscapes to landing amid mountains and valleys. Apollo 15 landed right next to a deep, sinuous valley called Hadley Rille, which the astronauts needed to look across and along and describe accurately, a skill they had practiced at the canyon of the Little Colorado River near the Grand Canyon.

Yet the Grand Canyon was also an unlikely place to learn about the moon. The Grand Canyon was made of sedimentary rocks, and no one was expecting to find sedimentary rocks on the moon. The Grand Canyon held ocean-deposited limestone full of fossils, and sandstone piled up by winds, and it had been carved by a powerful river, and no one was expecting to find oceans or wind or rivers or limestone or fossils on the moon. To teach the astronauts about stratigraphy it would have been easier to go to a road cut on the Interstate highway than to spend two days hiking in and out of the Grand Canyon.

The geologists did have other motives for selecting the Grand Canyon as their first training event. They wanted grandeur, the greatest grandeur on Earth. They wanted to inspire the astronauts with the power and beauty of geological forces. They wanted to make the point that doing geology was a great adventure, an adventure worthy of macho

astronauts. Elbert King, one of the geologists who went on the canyon hikes, explained: "In addition, the Grand Canyon is such a scenic place that we hoped to get even the most reluctant astronaut students 'hooked' on the charisma of geology and field work."² With so much NASA inertia and resistance working against geology, the geologists needed to get the astronauts on their side.

The geologists also wanted to prove that it was indeed possible to do realistic and valuable training for the lunar surface. And for the scientists who scoffed at the idea of "astrogeology" (the term the Apollo geologists had chosen for their field), the geologists were glad to show that this was not only a legitimate field but one that now had the power and prestige of NASA behind it.

The geologists planned to spend a day taking the astronauts down the South Kaibab Trail. They would separate into groups of two or three astronauts led by one geologist. They'd spend the night at Phantom Ranch and hike up the Bright Angel Trail to Indian Garden, about half way up, and from there the astronauts could ride mules the rest of the way out. The astronauts were divided into two hikes, one on March 5-6 and the other on March 12-13, 1964. The first hike included eighteen astronauts, two of them from the original seven Mercury astronauts, Alan Shepard and Scott Carpenter, plus two from the second group of astronauts, Neil Armstrong and Elliot See, plus all of the third group. The second hike included ten astronauts, four of them Mercury astronauts, Gus Grissom, Wally Schirra, Gordon Cooper, and Deke Slayton, plus the rest of the second group. Two years later, on June 2-3, 1966, eighteen astronauts from the fourth and fifth groups hiked into the canyon.

Some of the geologist-instructors were not sufficiently familiar with the Grand Canyon, so they did their own training hike on February 27-8, led by Eddie McKee. McKee, now with the USGS, had been a longtime Grand Canyon National Park ranger-

naturalist and had done important geological field research there, and he was organizing a major conference on Grand Canyon geology for later that year.

We are fortunate that the 1964 Grand Canyon hikes were covered in detail by William Hoyt of the Flagstaff newspaper, the *Arizona Daily Sun*. Hoyt was very enthusiastic about astronomy and space exploration, and he would soon start a career as an important astronomy historian, writing books about Percival Lowell and Mars; the discovery of Pluto; and the long controversies about the origin of Meteor Crater. Hoyt covered the astronaut hikes better than did any other newspaper or magazine. The coverage in the Phoenix newspaper, the *Arizona Republic*, was more in the spirit of celebrity gossip. Unfortunately, Hoyt left the Flagstaff newspaper in 1966, and the newspaper offered no coverage at all of the 1966 astronaut hike, though this was mainly because NASA did not invite any reporters to cover that hike.

The first hike included half of the twelve astronauts who would later walk on the moon: Neil Armstrong, Buzz Aldrin, Alan Bean, Eugene Cernan, Dave Scott, and Alan Shepard. It also included three astronauts who would orbit the moon: Michael Collins, William Anders, and Dick Gordon.

The astronauts were supposed to land at the town of Valle, which held the airport nearest to the Grand Canyon, but a snowstorm left its dirt runway too muddy, so the astronauts landed in Flagstaff instead, at 8 a.m. They arrived in two planes, one of them a scheduled Frontier Airlines flight, a precaution against an accident wiping out most of the astronaut corps. About thirty local officials and residents greeted them. The public and press were mainly interested in Alan Shepard and Scott Carpenter, the only astronauts who had already flown in space—the first Gemini mission was still a year in the future. The Phoenix newspaper wouldn't even call the others "astronauts," only "new trainees." Most of the astronauts

quickly gathered their luggage and climbed onto a bus, but Shepard and Carpenter took twenty minutes to extract themselves from the attention of the local officials, including the president of the Chamber of Commerce, who required official greetings and autographs and photo poses.

"All were dressed," William Hoyt reported, "in unmarked jackets and slacks and their luggage consisted of loaded backpacking gear for their hike into the Canyon. Carpenter, the target of more than a dozen young autograph seekers on hand at the airport, was dressed...in blue denim jacket and pants."³ The astronauts had to provide their own boots, some of which were ill-suited for a Grand Canyon hike. Carpenter wore white tennis shoes on the hike.

The astronauts headed for the South Rim and the Yavapai geology museum, where Eddie McKee greeted them and gave them an hour-long orientation about Grand Canyon geology, using a large relief map to illustrate his points.

At 11 a.m. the astronaut groups started down the trail, at five minute intervals. At least they didn't need to worry about heat; the temperature when they started out was a bit above freezing. The Phoenix newspaper reported that "Jay Goza, chief wrangler for the Grand Canyon mules, said 'I hope they aren't afraid of high places.' Shepard assured Goza that they were not."⁴

Each astronaut was provided with an aerial photograph of the canyon so that they could try matching its features with the landscape they saw before them, a skill that might prove useful when they were trying to recognize a planned landing site on the moon, or when they landed in the wrong place and needed to figure out where they really were—which would indeed happen on Apollo 11.

The hikers stopped frequently so that the geologist could point out types of rocks or large landscape features, or talk about geological ideas. The geologists and astronauts carried rock hammers and had permission from the National Park Service (NPS) to chip

off rocks. The geologists tested their “students” with questions, and they were impressed by how fast and how well the astronauts were learning. The astronauts also practiced making field notes.

The hike took most of the day, and they arrived at Phantom Ranch fairly late. When the hyper-competitive Alan Shepard got within 100 yards of the guest cabins, he challenged NASA public affairs officer Paul Haney to a race, and Shepard won by a yard. Ranch manager Ben Clark reported that they arrived “real good, with nobody crippled up from hiking. But they were very hungry, believe me.” The hikers feasted on “a hefty amount” of roast beef, mashed potatoes, carrots and peas, cake and coffee. “They were pretty serious young men,” reported Clark, “and very nice, and they seemed to enjoy the Canyon very much. Both Astronaut Shepard and Astronaut Carpenter were particularly enthusiastic about the Canyon.”⁵

This comment about Alan Shepard didn’t recognize that Shepard was and would remain one of the most anti-geology astronauts. He may have enjoyed the Grand Canyon for the adventure of it, but the canyon didn’t inspire him about geology. Some geologists would blame Shepard’s lack of enthusiasm and preparation for his failure to locate the crater that was the main objective of one of his Apollo 14 moonwalks.

Yet for other astronauts, the Grand Canyon worked its magic. Apollo 11’s Buzz Aldrin wrote:

There was a tendency among most of us, myself included, to regard the training rather disdainfully, like going to camp. It didn’t take long, however, before I was a willing convert, especially to the many geology field trips...

Geology opened my eyes to the immensity of time when one day I found myself standing at the bottom of the Grand Canyon paying rapt attention as the instructor talked about things that took place eons before man existed on this earth.⁶

Apollo 11’s Michael Collins recalled:

Our first geology trip was to the Grand Canyon and was one of the most interesting, partly because it was the first trip and partly because of the natural beauty and awesome grandeur of the place. Of course, the idea was to give us an opportunity to augment our classroom knowledge with field experience, to see not just a half-pound chunk of 801 on a desk top, but miles of it clearly delineated in a horizontal bed...About a dozen different rock formations have been exposed as the Colorado River cuts ever deeper into the Arizona desert, crashing along nearly a mile below the rim... As we descended the south rim along the famous Kaibab Trail, we examined and recorded (“hypidiomorphic granular”) each succeeding layer of rock, passing from the upstart limestones and sandstones through the older shales and finally, near the bottom, discovering very old rock, the tortured and baked Vishnu schist, over two billion years old. The flaw in all this was that...the rocks we saw were sedimentary types, having been water-deposited, and many contained fossil plants and animals, including shark teeth. Of course in 1964 no one knew what rock types awaited us on the moon, but no reputable scientists believed we would find sedimentary rock there...In fact, we used to joke about carrying a few fossils to the moon to mix in with the lunar rock samples, and I am surprised that no lunar crew has announced the discovery of a fossil or two on the radio, just to shake up the geologists in Mission Control.

Nevertheless, it was a beautiful trip down in the Grand Canyon... we relaxed and chipped rocks with our hammers, enjoyed the magnificent scenery, and wondered at the changing world we were entering...I confess that on this trip—indeed all geology trips—I found the flora and fauna

much more interesting than the rocks. Some in our group, like Roger Chaffee, were becoming damned good geologists, perhaps because they truly enjoyed it or perhaps simply because they were quick studies. However, I never quite did get into the spirit of the thing, and spent as much time engaging in rock-throwing contests with Gene Cernan as I did filling my field notebook with maps of outcrops and such.

Our trip down into the canyon took nearly the whole day, so we spent the night in a charming inn at the bottom, and the next morning those of us who wanted to rented burros for an expedited ascent. I chose to ride, but picked an animal which stopped walking whenever I stopped kicking, so I got as much exercise as if I had been afoot. I also had plenty of time to contemplate the rapid pace at which I was speeding toward the moon. From supersonic jets at Edwards, I had progressed all the way to kicking a burro up out of the Grand Canyon. Just as the jets had their tricks, so did this creature...I certainly was willing to share my burro with a deserving scientist or two, provided they did their share of kicking and I got to steer.⁷

Ten of the eighteen astronauts on the hike had visited the Grand Canyon previously, as tourists, but only two of them had hiked into it. One of them was Neil Armstrong. In 1952 Armstrong returned to the U.S. from air combat duty in Korea and had a period of military leave. Earlier that year Neil had paid \$2,000 in cash for his first car, a new two-door Oldsmobile 88, the same model his father owned. Neil’s brother Dean traveled from Ohio to California to join Neil, and they went on a long road trip that stretched from Canada to Mexico and included ten national parks. They camped out most of the time. At the Grand Canyon they hiked to the bottom and back out. This Grand Canyon hike may have been the highlight of their

adventure. Armstrong probably was remembering that hike during his astronaut hike. Armstrong did feel the charisma of the canyon and of rocks. Armstrong became one of the most eager geology students. Apollo historian Andrew Chaikin said:

For years, the geologists had the feeling that Armstrong was genuinely interested, and that he was picking up more than most of the other pilots; Armstrong turned in an excellent performance on the moon. In the postflight briefings he was full of detailed comments on what he had seen, and he made clear the potential for a scientific observer on the moon.⁸

I was told this again in a conversation with Gordon Swann, one of the leaders of the geology training. Swann wasn't on the 1964 hikes but did conduct briefings with Armstrong. Swann said that Armstrong was more motivated and perceptive than most of the astronauts, and Swann wished that Apollo 11 had been able to spend more time on the moon so that Armstrong could have done more geology.

In response to my inquiry, Neil Armstrong responded with an e-mail recollection of his Grand Canyon hike:

I do remember the trip (it was my second trip to the bottom), staying at the lodge at the bottom, riding out the Bright Angel trail on mules (I walked out the first time), and studying the stratigraphy...I thought all the 'students' in the geology field trips took the opportunity to making it a true learning experience. They recognized that their proficiency in this subject (generally not previously known to them) might have an influence on their Apollo assignments. As for myself, I found the geophysics more akin to my engineering background than the geology. Although I enjoyed the geology, I never had a 'passion' for it and, consequently, never considered myself a real geologist.⁹

Armstrong did recognize his mount to be a mule and not a burro. Yet Armstrong may have shared Michael Collins's musings about the dubious trajectory of his career, from super jets to cranky mules. There is a photo of Armstrong riding his mule out of the canyon, and he does not appear to be very inspired.

Also on the hike was Eugene Cernan, who would be the commander of Apollo 17 and the last man on the moon. To my inquiry, Cernan answered:

The intent was to walk through the millennium of time that was exposed in the walls of the Grand Canyon from top to bottom where the Colorado River now flows to get a better understanding not just about geology or the geologic times that were evident, but as well to get a feeling for the enormous impact of nature...It was a day-long trip from top to bottom and back up to the top again. What I remember very vividly is that all of us in the group walked down to the River and most of us, but not all, walked all the way up. Those who didn't, chose to ride on the back of a burro. Those who chose to walk up were probably the more competitive of our group. Although I couldn't tell you by name who they were, but yes, I was one of them.¹⁰

Another astronaut on the hike was Alan Bean, who walked on the moon on Apollo 12 and who later became a full-time painter, painting scenes from the Apollo missions, including scenes of astronauts doing geology on the moon. In 1998 Bean and Andrew Chaikin published a book about Bean's art, and in the introduction John Glenn (who wasn't on the Grand Canyon hike, having retired from the astronaut corps to run for the U. S. Senate) compared Bean with Thomas Moran. Moran's 1870s paintings of Yellowstone and the Grand Canyon had given Americans their first visions of the great landscapes of their West. Alan Bean would inspire Earthlings about the moon.

But Bean needed the Grand Canyon to help inspire him about geology. Chaikin wrote:

...the future lunar explorers were expected to learn geology. That meant hours of difficult lectures and laboratory exercises on subjects such as rock and mineral classification. Strange as it may seem, Bean had never heard of terms like "aphanitic vesicular basalt" or "plagioclase feldspar phenocryst." Now he was expected to make them part of his working vocabulary. But there was good news, too: field trips to spectacular places like the Grand Canyon, where a billion years of history were written in layers of rock.¹¹

The astronaut who became most devoted to geology was Dave Scott; his enthusiasm helped motivate his fellow Apollo 15 crewmembers, Jim Irwin and Al Worden, to take geology seriously. They needed to do so, for their mission was the first mission with a multi-day stay on the moon, a lunar rover for more extensive travel, and nearly twenty hours for science on the ground. When NASA planners were debating where Apollo 15 should land on the moon, Scott argued for a more difficult landing site, Hadley Rille, because it offered the best geology. When the HBO mini-series "From the Earth to the Moon" devoted one episode to lunar geology, it was centered on Dave Scott.

Scott was on the first Grand Canyon hike. Andrew Chaikin wrote:

Early on, Scott had shown more enthusiasm for geology than most of the pilots. He'd long harbored an interest in archaeology; as a fighter pilot stationed in Tripoli he'd visited the ruins of Roman cities in the Libyan desert. When the astronauts hiked into the Grand Canyon...Scott saw nearly two billion years of history written in twisted metamorphic rocks and perfectly exposed strata of limestone, sandstone, and shale. For the first time he understood what it meant to talk about

geologic time, in which millennia are reduced to moments. And each outing brought new spectaculars... At his home in El Lago [Texas], Scott proudly displayed his rock collection in a specially made wooden cabinet.¹²

Scott's wife began taking a college class in geology so she could share his interest. Scott became very frustrated at the lack of interest among NASA managers. He had to argue strenuously to get them to include on his mission a light aluminum geology rake and a telephoto lens for taking high-resolution photos of features too far away to visit. One small tool Scott took to the moon was a hand lens he borrowed from Gordon Swann. Swann told me that a year after Apollo 15, Scott came through Arizona and took his family to see the Grand Canyon, and afterward Scott came through Flagstaff and gave Swann back his hand lens, now in a shopping bag from the canyon's Verkamp's Curio Store. Scott had named a lunar mountain range for Swann.

The astronauts left Phantom Ranch at 7:45 a.m. and headed up the Bright Angel Trail in the same groups as the previous day. On the way up, the geology instruction consisted mostly of the geologists quizzing the astronauts to see how much they had learned and could identify. They ate lunch at Indian Garden. Mules were waiting to carry them out, but the more competitive astronauts, led by Alan Shepard, insisted on hiking. Eight astronauts hiked out, and ten rode. William Hoyt reported in the Flagstaff newspaper: "Shepard was the first of the 18 Astronauts...to reach the South Rim...reaching the head of the Bright Angel Trail at 2:05 p.m., a full hour before the first group on muleback. Chomping a cigar, he gleefully greeted his saddle-sore companions as they climbed down off their mounts."¹³

Also hiking out was Scott Carpenter. In the lobby of the Bright Angel Lodge someone asked Carpenter why he wanted to go to the moon, and, according to the Phoenix newspaper,

Carpenter "waved his hands and answered 'Because it's there.' You would expect that kind of answer from a mountain climber, and Carpenter got his spurs in that field while attending Boulder, Colorado, High School and the University of Colorado at the foot of the Rockies."¹⁴

The Phoenix newspaper also reported: "The climb was comparatively easy for one astronaut trainee. Walt Cunningham...once climbed Mt. Fujiyama in Japan."¹⁵

Cunningham was the only other astronaut, with Neil Armstrong, who had hiked into the canyon before. But Cunningham remained a cynic about geology. In his memoir Cunningham complained that geology lectures were boring and said that new astronauts attended the optional lectures only because "we were looking desperately for an edge," a way of standing out. But: "The professors had zero influence, and there weren't many dramatic possibilities in that situation: no safely bringing down a burning aircraft, no untying little Nell from the railroad tracks."¹⁶ At least hiking out of the Grand Canyon offered a chance to prove something.

Some of the geologists were well-conditioned by years of field work, but according to Elbert King: "The astronauts' better physical condition annoyed the geologists throughout the geology training course. Some of the instructors started running and exercising regularly, but it always seemed the astronauts were far ahead of us...In the end, it was just a fact of life we had to accept."¹⁷ The truth was that the astronauts suffered quite a bit too, mainly from using the wrong footwear, but they wouldn't admit it.

Elbert King, whose hike students were Michael Collins and Roger Chaffee, was also impressed by their mental prowess: "They were willing students who had no trouble grasping the concepts we wanted them to understand...The astronauts much preferred this form of instruction to formal lectures and classes. The geologist instructors agreed that a lot of teaching and learning had been accomplished in the field with relative

ease."¹⁸

In the lobby of the Bright Angel Lodge the astronauts held a press conference, though Alan Shepard did almost all the talking. "I'm just a little old farm boy from New Hampshire," he said, "but to me the Grand Canyon was very impressive indeed." His mention of New Hampshire prompted reporters to ask Shepard if he were going to vote in the upcoming New Hampshire primary where Arizona's Senator Barry Goldwater was launching his presidential candidacy, and Shepard said no, though he'd vote in November. Another reporter asked Shepard if he, like John Glenn, had any plans to run for office, and Shepard admitted that he'd been asked to run, but he wasn't interested. The Phoenix newspaper's story was mostly about Shepard's political comments. At least William Hoyt was interested in the purpose of the trip:

Dr. Jackson and other geologists explained briefly at the press conference that the Astronauts were studying the geology of the Grand Canyon "to make them more competent as scientific observers and sample collectors when they reach the surface of the moon."

The Astronauts will take the samples they collected on the trip back to Houston where they will study them in laboratories.

"This will give the Astronauts a representative geological collection, Dr. Jackson noted. "We're interested of course in training them to be good geological samplers so they'll know what to look for and bring back from the surface of the moon. We will be able to learn a great deal from such geologic samples..."

...All have flown over the Canyon and Carpenter said he went over it during his triple-orbit flight "but I didn't get much of a look as it was covered with clouds."

Following yesterday's press conference, the astronauts watched briefly as the Canyon's

Hopi Indian dancers performed in front of Hopi House and then ate dinner at Bright Angel Lodge...¹⁹

The newspaper article included photos of Alan Shepard mobbed by local Boy Scouts, Elliot See signing his autograph on a girl's forehead, and an older lady tourist in Hopi House warning Scott Carpenter: "Please don't go up there again, and the rest of you should stay down here too." There was no report of why she was worried. Perhaps she was reading the Dick Tracy comic strip—which abutted Hoyt's articles—that detailed Dick Tracy's adventures flying in a "moon coup" and meeting a sexy moon maiden with forehead antennas. Moon fever was in the air.

A week later the rest of the astronaut corps arrived. Once again the center of attention was the Mercury astronauts, Gus Grissom, Cordon Cooper, and Wally Schirra, who had already flown in space, plus Deke Slayton, who had been grounded due to a heart condition. It was Schirra's 41st birthday, and at the Flagstaff airport city officials presented him with "a chocolate birthday cake suitably inscribed and contained in a bright pink cake carton..."²⁰ Schirra, wearing a cowboy hat and a camera, happily showed off his cake to his fellow astronauts.

The second hike included two astronauts who would walk on the moon, Pete Conrad and John Young, and three who would orbit the moon, Frank Borman, Jim Lovell, and Thomas Stafford.

This group of astronauts repeated the schedule of the first group, starting with an orientation lecture at the Yavapai geology museum, though this time USGS geologist Al Chidester substituted for Eddie McKee. They took six and a half hours to reach Phantom Ranch. After dinner they sat in the dining hall for awhile and talked. "But they went to bed early," according to ranch manager Ben Clark, "they were all in by 8:30 p.m. and they sacked right out."²¹

During the night snow began falling on the rim and it continued

into the morning, five inches of it by the time the astronauts started their hike at 8 a.m. Lower in the canyon, it was rain. There was also lots of fog. The astronauts were warned that the trail ahead was a muddy and slippery mess, and this time all of them chose to ride mules from Indian Garden to the rim. "It was a bit chilly," commented Frank Borman. An *Arizona Daily Sun* photograph of Borman and Pete Conrad on mules was captioned that they "looked more like a couple of veteran mule skinnners than spacemen as they ride out of the Grand Canyon."²² The Phoenix newspaper captioned its photo "Orbit Canyon on Mules: Some members of the astronaut space team orbit the spaces of the Grand Canyon."²³ At the rim the mule wranglers gave the astronauts certificates declaring them to be Genuine Grand Canyon Mule Skinnners.

William Hoyt asked Deke Slayton whether the heart fibrillation that had grounded him was an issue on the Grand Canyon hike, and Slayton replied that, on the contrary, vigorous exercise made his heart fibrillation go away. Slayton also said that the geology training was a success: "We really learn something when we actually see the rocks and formations. They say the best geologist is the one who has seen the most rocks and we've seen a lot of rocks in the last two days."²⁴

Unlike the astronauts on the first hike, the participants on the second hike have left few comments about it. In his memoir Gordon Cooper didn't say anything about the hike but he did mention that when he was hosting some Soviet cosmonauts on a goodwill tour of the U.S., he took them to the Grand Canyon, and Disneyland too. Frank Borman said of the overall training:

Some of it was valuable; some I judged to be a waste of time. They gave us about fifty hours of geology, which included trips to such fun places as the Grand Canyon and Meteor Crater in Arizona. The idea was to prepare those astronauts who would be

assigned moon landings and subsequent exploration of the lunar surface, but fifty hours? I didn't think that much was necessary.²⁵

It probably wasn't necessary for Borman, who never landed on the moon. But the geologists considered the canyon hikes a great success. In a 1965 *National Geographic* article about all aspects of the astronaut training, which included photos of the astronauts working in the canyon, geologist Uel Clanton was quoted: "Grand Canyon makes a magnificent classroom."²⁶ Thus when two newly-selected groups of astronauts needed to start geology training, the geologists brought them to the Grand Canyon, on June 2-3, 1966.

This hike included eighteen astronauts, with three future moonwalkers, Charlie Duke, Jim Irwin, and Edgar Mitchell, plus six astronauts who would see the moon from above: Ron Evans, Fred Haise, Thomas Mattingly, Stuart Roosa, Jack Swigert, and Al Worden.

It's not clear why no reporters were invited to cover the 1966 hike, but for NASA 1966 was a very busy year, with five Gemini missions, and many astronauts felt that reporters and public relations duties were a huge distraction. This hike followed the same schedule as the first two, beginning with a talk at the Yavapai geology museum, again with Eddie McKee. The main difference was that it was now summer and very hot at the canyon bottom. This time the astronauts would camp out.

Future Apollo 16 astronaut Charlie Duke knew what the canyon was like in summer, for he had been there in July of 1964. He and his wife Dotty were driving from Boston to Edwards Air Force Base in southern California, where Duke was to begin his career as a test pilot. They'd had time to spare so they went camping in the Rockies and spent a few days at the Grand Canyon, including riding mules into the canyon. Duke recalled his 1966 hike:

At first we thought of our field

trips in terms of, "Ho hum let's go out and look at some rocks." We soon learned that such trips can be demanding exercises...

Our first trip...was a hike to the bottom of the Grand Canyon. When Dotty and I had visited the canyon several years earlier, we had ridden mules from the north rim. This walk was to start from the south rim...

It took us all day to reach the bottom, and by the time we got there most of us had feet that were just one big blister. My flying boots really didn't double as hiking boots.

Blisters and all, it was great to have arrived. I was surprised to find a virtual oasis of cottonwood trees and a grassy meadow in the bottom of the canyon...

We were all ready to jump into the river to cool off, then were delighted to find that someone had been foresighted enough to bring some beer down for us to have a cool one. Once cleaned up and cooled down by a few beers, we enjoyed a hearty meal that had been prepared by the ranch staff.

It was a beautiful night—so we threw our sleeping bags on the ground and settled down to get some rest...The moon was out and the walls of the canyon were silhouetted in its light. Lying in my sleeping bag, I was transfixed by this magnificent sight above me. I couldn't help wondering if one day I might actually set foot on that moon.

I was sleeping soundly when suddenly I awoke with a start! *Something ran over my sleeping bag!*

I sat up quietly and looked around. I don't know whether it was a male chasing a female or two males, but a pair of skunks were engaging in a big fight, running wildly about among our party of ten guys.

We're really in trouble now, I told myself. If one skunk catches the other on top of our sleeping bags, we're going to get wiped out! I stayed very still so that they wouldn't know I

was awake. If I frightened them, they surely would have gassed us all. Eventually they ran off into the night.²⁷

Most of the other astronauts never learned what nearly hit them. NASA was spared from having to explain why America's bravest men went fleeing from a cute little animal.

While Apollo 15's Dave Scott and Jim Irwin were doing geology on the moon, Al Worden was circling miles above them in the command module. Worden too had become captivated with geology, partly from the influence of Dave Scott, and partly from the Grand Canyon:

The dry training style our teachers used in the classroom never really gripped me, but my attention picked up when we started to make geology field trips. To be out in the wild landscape made a huge difference...I loved the feeling of being out in the field and so, it turned out, did my fellow Apollo crewmates...

If I hadn't already been awed by natural wonders, the long trek down to the floor of the Grand Canyon would have done the trick...Hiking down from the canyon rim, we examined the layers of rock all the way down to the primeval crust. The experience taught us little about the moon. Nevertheless, it exposed us to more geological processes and examples. We were better prepared, because we were seeing things in context, a whole awe-inspiring mile of context.

This sense of context was particularly important for me. I already knew I wouldn't be walking on the lunar surface. Instead, when I made my flight, I would have an incredible view of the grand sweep of lunar features from only a few miles up. I would be looking at the big picture, and that could often tell us much more than standing on the ground in one place.²⁸

Unfortunately American politicians

didn't share this interest in science. They cancelled three planned Apollo missions, though the hardware for them had already been built, the training done. The long frontier experience that had given Americans all the practical skills to reach the moon had also failed to give them the values required to justify going to the moon, the values of wonder and exploration for its own sake. Half of the men on the 1966 hike would never fly on an Apollo mission. But some of them would fly on Skylab and on the Space Shuttle.

Among these was Paul Weitz, who was so impressed with northern Arizona that he moved there after his NASA career. Thus I was able to have breakfast with Paul Weitz one morning at the Weatherford Hotel in downtown Flagstaff.

Paul Weitz was on the first Skylab mission and the first launch of the Space Shuttle *Challenger* (the sixth flight for any shuttle), and later he became the deputy director of the Johnson Space Center. Weitz was selected as an astronaut in the fifth group of astronauts, in April 1966. By then NASA was looking for stronger science credentials, not just piloting skills. Only a few weeks after being selected the new astronauts found themselves hiking into the Grand Canyon. Weitz had never been to the canyon before. Weitz was paired with Jack Swigert, who would be the command-module pilot on the ill-fated Apollo 13 mission, and for an instructor they had Aaron Waters, a UC-Santa Barbara volcanologist who was on Eugene Shoemaker's team for planning the actual lunar field work. Waters had been in charge of one of the first astronaut training trips, to the volcanic fields near Bend, Oregon, in October 1964. Weitz would also go to Meteor Crater with Eugene Shoemaker. Weitz told me that he recalled Eddie McKee's orientation talk, but he was vague about the details. He found the instructors to be very capable, and very personable. The trip was well organized, except for NASA's continued neglect of proper boots for a Grand Canyon hike. NASA

left it to the astronauts to guess their own footwear. Like other astronauts, Weitz got bad blisters. But at least someone brought along moleskin. That night Weitz slept outside. I asked him about Charlie Duke's encounter with the skunks, and Weitz said he must have slept right through it. But on one of his later geology field trips in Alaska, Weitz was chased by a bear. As on the first two canyon hikes, the out-hiking astronauts were met by mules at Indian Garden, but the mules too caused blisters, another subject on which the astronauts kept quiet. Weitz wasn't sure which type of blisters was worse. The geology training was done on the way down the trail, and included many stops. Weitz found the training to be very valuable, and the canyon very inspiring. Weitz wasn't aware of the behind-the-scenes political struggles that had prompted the geologists to use the Grand Canyon to inspire the astronauts and impress NASA managers. In later years Weitz came back to the Grand Canyon just to see more of it. Weitz did find his geology training useful on Skylab, much of which was devoted to studying Earth landscapes.

I also heard from three other astronauts who were on the third hike.

Jack Lousma was on the second Skylab mission and commanded the third Space Shuttle flight. His memories of the Grand Canyon hike included the same highlights as the other astronauts: the drone of classroom lectures, the drama of the hike, the vivid rock layers. Lousma added: "We were equipped with standard geology tools and equipment; just enough to be dangerous!...It was hot. We came across a few visitors who were stalled out and without water, so we got help for them. We slept under the stars at Phantom Ranch."²⁹

Bill Pogue was on the third Skylab mission. In 1955, as a gunnery instructor at Luke Air Force Base in Phoenix, Pogue led one training flight over the Grand Canyon and was awed by the view from close above the rim. Now he got to see that view from the inside. Pogue sent me an excerpt from the autobiography he was writing:

The one I'll never forget was the first one, a two-day field trip to the Grand Canyon...After we reached the bottom we walked to Phantom Ranch. They didn't have rooms for us but did provide the evening meal. Sleeping bags had been transported down on donkeys and we unrolled them and slept on the ground. It was a beautiful starlit night and we practiced a little of our star and constellation identification. The muscles in the front of my thighs were quite sore from the downhill walk so I was a bit uncomfortable and had difficulty going to sleep. However, that was the least of my worries.

I heard a disturbance and raised my head to see what was going on. Two skunks were leaping over and around our sleeping bags: one was chasing the other, which I assumed was a mating ritual. I kept very quiet and didn't move. Suddenly Charlie Duke who had already fallen asleep rose up out of his sleeping bag and I said "Charlie, don't make any noise; there are skunks among us! He lay back down and I pulled my bag over my head for protection in case they hosed down the area. Soon they left and the rest of the night was peaceful...

It was really a quite interesting and enjoyable field trip.³⁰

Gerald Carr was the commander of the third Skylab mission. He illustrated the astronauts' sense of humor:

The next morning we began the hike up Bright Angel Trail and got to a rest stop part way up where mules were waiting for us for the rest of the hike. We had a television camera man with us who documented the training exercise, and by the time we got to the rest stop he was exhausted. He laid down his large, heavy camera on a table and went to sleep next to it. Astronaut Jack Swigert sneaked over, stole his camera, and while someone held up a mule's tail Jack took extensive footage of the

south end of the animal. Then he quietly placed the camera next to the sleeping camera man, and not another word was said.

We all enjoyed the mental picture of the video people reviewing the tapes, but they never gave us the satisfaction of acknowledging the camera work.³¹

One astronaut told me a story about an unnamed astronaut who wanted to collect a fossil trilobite from the Bright Angel Shale. His instructor warned him that he would probably break the fossil, but he tried anyway. He broke the fossil.

Of the twenty-four men who flew to the moon, the only one who missed going on a Grand Canyon hike was the only astronaut who was also a geologist. Harrison "Jack" Schmitt studied geology at Caltech and got a Ph.D. in geology from Harvard, and he walked on the moon on Apollo 17, the final mission. There's no record of why Schmitt wasn't included on the 1966 canyon hike, but clearly Schmitt didn't require an introduction to geology.

By 1967 NASA had expanded its standard geology training to 100 hours in the classroom and ten field trips, but for the last three, science-rich missions, there were about twenty field trips designed to fit each mission. In all NASA conducted about 200 geology field trips. Many of these occurred in northern Arizona, which offered Meteor Crater, many volcanoes and lava flows, and especially an artificial moonscape where technicians had blasted dozens of craters into a volcanic cinder field and set up a mockup of the lunar lander. Other field trips included Hawaii, Iceland, Alaska, Big Bend, the Mojave Desert, and Craters of the Moon National Monument in Idaho. Yet when the astronauts came to write their memoirs, it was the Grand Canyon hike they remembered best.

Somewhere along the South Kaibab Trail there are dozens of boulders and cliff faces with pieces missing, pieces chipped off by the astronauts,

by the same hands that chipped off moon rocks and brought them back to Earth. The South Kaibab Trail was the pathway to the moon. The Grand Canyon held the same eons and primordial forces and wild grandeur as the moon; it inspired the same ancient human awe at the mystery of the world and the mystery of ourselves.

(Endnotes)

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Louis Schellbach's Log Books: Part 5

by Traci Wyrick

OVERVIEW: Second half of 1944

From air men being stranded in the canyon, to their subsequent rescue and what part, if any, did Emery Kolb play—to the discovery of a new agave, or the detailed work of an entomologist—1944 was a “happenin” time. There was trout fishing in Clear Creek, interesting weather, to-do with squirrels, and a Presidential wedding. Work on eradicating Russian thistle was ongoing. On August 29th, the Dragon formation on the North Rim caught on fire. Eddie McKee was welcome company at the Schellbach's home during his frequent visits to the Park.

The following are the diary entries I selected for the remainder of 1944. As a reminder, I have recorded the entries as originally written.

Friday June 23, 1944

Routine service to public at Yavapai. At close of station 5:00p.m., had to take a member of the U.S.G.S. to shop to supply him with a series of lithologic specimens from the Canyon formations—he working on potrolothic determinations. After dinner to shop again to prepare entomological specimens on research rearing of larvae. Today notified that three air men had

parachuted from disabled plane two nights ago and were supposed lost in the Canyon. Spent time searching with glasses for them.

Saturday June 24-1944

Routine at Yavapai, cleaning windows and grounds for weekend visitors. A parachute has been reported discovered below Point Sublime. Arrangements being made by Spud Bill to go in after the men and rescue them. They will go in over Tonto Platform on north side from Phantom Ranch. (No, on South Rim to Tonto along Hermit). King and another ranger to meet them from the north side at Phantom. Carpenter Payne building a canvas boat to bring the men across the river, somewhere at mouth of Tuna Creek. A party from South Rim to go down and with a harpoon gun shoot a line across the river to the party on the north side, for hauling boat across and bring out the air men. Two only of the three parachutes have been so far discovered from the air. In evening with family to movie.

Sunday June 25- 1944

Called on the phone this a.m. at 7:45 by Asst. Supt. Davis, that I will have to take over Yavapai Station for the day as there is no one available to relieve

me on this my day off. Dr. Bryant still at Clear Creek and not expected back until Tuesday. Hope he and the “Arizona Highways” man have good trout fishing. Ten moths have emerged from the pupae reared from larvae during the night and morning. Will have to prepare them as specimens this evening. So at present I have a full day before me. Eight of the moths are from the Wild Currant and two from Lomatium. Showers at 10:00 a.m. (M.S.T.) Thunder. At work spreading the 8 moths that had emerged this evening at Workshop until 9:40 p.m.

Monday June 26, 1944

Attended rain gauge weekly report and also another moth of the Lomatium series emerged. The two others kept alive since Saturday and the one of today were placed in cyanide bottle. Will spread them this evening. After dinner last night, went out to Pima Point to see the parachute on Tonto Platform below Point Sublime west of Tuna Creek. It was very plain as a white spot and through the glasses could be made out. Our rescue party could be seen below Pima Point, making camp in the creek bed below the old Hermit Rest camp site.

This a.m. an Army Red Cross ambulance arrived and also an Army staff

car. Up to the present have not heard if the other two men of the group of three that had parachuted from the disabled plane, had been located. The one at the above, had been contacted by note and supplies dropped to him. 1:00 p.m. All three men are reported to be together at the site of the parachute. This was made known by flares, lit by them as instructed by note dropped at that place. A great relief is felt by all locals here at Grand Canyon at this news. The next hard problem is getting to them across the river and gorge.

Evening at workshop on reared specimens. During the afternoon one of the black pupae moths emerged and is different from those of brown pupae. So have two species feeding on the same *Homatiuss* moth?. This is interesting as the black fed on the leaves and the brown on the flowers. After 7:30 p.m. contacted Jackson of the Arizona Highways magazine and took him to the shop to see Northups photos, kodachrome collection and to give him information on the work of the interior dept until 10:20 p.m. He said he had a good trip with Dr. Bryant into Clear Creek and they had good fishing.

The portable sending and receiving radio with Spud Bill on the rescue expedition seems to be out of order. Poor batteries seem the trouble. Could not contact them in the evening. New batteries have been sent from Santa Fe and will go down in the Canyon with the second party carrying in provisions and a coast guard man with harpoon gun for firing a line across the river.

Tuesday June 27-1944

Before going to Yavapai, checked over the rearing jars at shop. Placed moth that had emerged yesterday in cyanide jar and sometime this noon will place it in relaxing pan for spreading this evening. Picked up paper and refuse about station and wiping and dusting and watering of plants. 1:00 p.m. Mr. Jackson of Arizona Highways magazine requested that he would like to again go through the workshop for making some special notes—complained and got back to Yavapai at

2:00 p.m. for the afternoon. Evening at workshop for spreading the above moth and taking other specimens set from spreading boards and placing in collections. Another of the above moths from the black pupae emerged during the afternoon and one red and black striped moth was captured this evening. Republican convention is in session in Chicago. No further word on the men down in the canyon.

Wednesday June 28-1944

Before 9 a.m. at shop placing live moths of yesterday in cyanide jar. Dug out title of readers book for H.C.B. To office to check paper on desk then to Yavapai. Watered plants and working on correspondence. Yavapai routine. The rescue party under Chief Ranger Bill and the second string of pack mules with supplies returned without success. The Colo. R. rose 15 feet and no place was found where the Party could cross. There appears to be a route down from the North Rim off Grama Point just east of Point Sublime to the head of Tuna Creek. The wall of Coconino sandstone is broken down into a talus and just east of the head of Tuna Creek the redwall limestone shows a break down onto the Tonto Platform. Ranger Ed Laws will descend on foot with one other man (Max Rae, an annual visitor to GC) this afternoon. They will be followed tomorrow with another party carrying supplies and water. Laws will show the stranded men the way out and at a halfway place meet the second party. This route is about 5 miles long, so should not be very difficult on foot. "Walkie-talkie" radio sets have been brought in, one of which was dropped by parachute to the men down below. They talked to the Army officers on the rim and report that all three are well and uninjured and want orders permitting them to walk out or climb out. Went to Pima Point after dinner and with my glasses saw their parachutes spread on the ground just beyond Tuna Creek on the Tonto Platform. Bill and Davis left for north rim to supervise the party organizing there and

to contact Army convoy carrying in to establish a base camp for rescue work. At shop upon return from Pima Point to spread entomological specimens. Wrote Natt Dodge, cet. Reg. naturalist at Santa Fe.

Thursday June 29-1944

A.M. Yavapai routine. Warmest day this year so far. 83 degrees at the porch of Yavapai. The record hot day at Phoenix. Ranger Ed Laws and professor Max Rae reached the parachutists and started out. Will camp at the redwall for night. Radio broadcasts were held several times this evening at Hermit Rest, giving out news on the progress of the rescue. Emery Kolb is very much peeved that he was not asked by the Park Service to help in the rescue work. In his own opinion he is the most logical man to head up the rescue work, for he and he alone knows all about the Colorado River



photo: Grand Canyon National Park #06688

and Canyon. He started out alone, with his grandson Sonny, down the Boucher trail, hoping to beat the organized party in the rescue. He started the same sort of a stunt in 1937 in wanting to beat the American Museum of Natural History's Shiva Temple Expedition to the top of Shiva. He was warned to keep away from Tiyo Point and Shiva—he ignored the orders and sneaked out there. He evidently has a persecution complex.

Friday June 30-1944

An Army rescue party from Kingman AZ, an elaborate outfit, moved in on the North rim yesterday. Posted large signs from Jacob lake down to Park. A strange incident that one of our own rangers, Sam King, had to get a permit to go to Point Sublime for the Army. How come?

Signed letters to Natt Dodge and McKee and proceeded with daily routine at Yavapai. A short talk with Supt. Bryant getting some details on the rescue progress. P.M. The three Army men have reached the rim and Bright Angel Point and are proceeding by car to South Rim. This being our wedding anniversary, Ethyl, Don Lou and Preston and yours truly had dinner at the El Tovar hotel. The rescued men arrived and had dinner, cleaned up and the N.B.C. radio men, put them on the air in an interview of their experiences after having parachuted into the canyon and being marooned 10 days. This was at 10:05 p.m. (war time) Had quite a chat with Mrs. Frank Oesler.

Saturday July 1st 1944

Another moth emerged yesterday on the Lomatum from a brown pupae. The remaining black pupae do not seem to be alive and are not as large as the previous ones. General clean up at Yavapai and the changing of monthly record sheets. The three lost parachutists visited Yavapai this a.m. with Supt. H.C. Bryant and I had quite a talk with them and learned that there are pools of good water in Tuna Creek and that there is a spring below the rim on the west side of Grama Point. To Community House in evening for "movies" with the fam-

ily. Thunder storms in vicinity during the day. H.C. Bryant to relieve tomorrow at Yavapai.

Friday October 6, 1944

To shop servicing stoves so that the place may be comfortable this evening for Mrs. Haring's talk and exhibit of mosses. Prepared blackboard. Yavapai routine. Cannot somehow or other get on preparing monthly report. So many other items calling for attention. Notified that I am to accompany Guy Jackson, Asst. Supt. Davis, on trip into Clear Creek tomorrow. To be gone until Thursday the 12th. Evening preparing for a talk on "Mosses" by Mrs. Inez Haring at the workshop. Very successful evening and enjoyed by group. Mr. & Mrs. Bryant, Mr. & Mrs. Spud Bill, Mr. & Mrs. Davis and children, local school teachers, some 20 people in all.

Saturday, October 7th 1944

A.M. preparing equipment and purchasing supplies for trip into Clear Creek. Purchased fishing license. Left So. Rim 2:55 p.m. six in party, 9 animals, from Yaki Point down Kaibab Trail. Trail very dusty. Encountered the State Teachers College, Hiking Club, enroute. Arrived Rock House, below Phantom Ranch 7:00 p.m. Rock wrens fairly common. Little bats numerous along river & B.A. Creek. Ringtailed cats. Spotted skunk under Rock House, walked about during dinner.

Sunday, October 8th 1944

Packed outfit, saddled up and started up for the Clear Creek trail about 9:00 a.m. Trip over Tonto Platform into Clear Creek, warm but uneventful. Reached C.C. approx 3:00 p.m. Unpacked and rigged fishing tackle. By supper time all were in with their limit of Rainbow Trout. Stream heavily overstocked. Around the lantern, captured moths for study collection.

Monday, October 9th 1944

John Davis started down Clear Creek for the falls and Colo. River, with Guy Jackson and Edick, taking lunch. Schellbach, Roy James and Miller up Clear Creek fishing and

collection specimens. Collected specimens of Agave new to Grand Canyon at Junction of Clear Creek Forks, some 15 specimens of mosses. The right hand fork was dry. Returned to Camp about 2 p.m. and had light lunch. Those who went down the river drifted back singularly and had trout dinner around 7:30 p.m. This day took kodachromes of Agave at forks and some scenic views. Black ring-necked lizard observed. Golden eagle, juncos, flickers and western robins also a towhee, and many wrens – pack rat. Coyote sign, plentiful but not fresh. Black swallow tail butterflies quite numerous.

Tuesday Oct. 10th 1944

Prepared specimens collected yesterday and did some photographing. Movies of outfit and trout. On upper left hand fork of Clear Creek the trout proved to be Eastern brook trout with not a sign of Rainbow. They were above a 12' fall. This is strange, and can only be accounted for as having survived the flood of '36. Eastern Brook Trout eyed eggs were planted in the stream in the late 1920 (1927?) by Art Brown and Jim Brooks. Took a specimen for collection. No. F-15. Trout dinner again this evening. Dried some for taking out tomorrow.

Wednesday Oct. 11th 1944

Broke camp, cleaned up and pulled out for Bright Angel Creek and the Rock House. Sky overcast with occasional sprinkles. Took more Kodachromes enroute and some movies 16 m.m. Arrived Rock House around 3:00 p.m. Had dinner at Phantom Ranch. Took view's of mouth of B.A. Creek. This day observed numerous millipedes along Clear Creek Trail. At Phantom Ranch along B.A. Creek saw a pair of Water Ouzel or Dippers.

Thursday, Oct. 12th 1944

Broke camp and pulled out for South Rim at head of B.A. Trail. Trip uneventful, took several exposures, saw one Boyle King snake at Pipe Creek. Arrived rim about 4:00 p.m. Unpacked and headed for home. Trip a success. Regret I did not take more

collecting equipment for entomological specimens and botanical material. Evening to Community House for "Bingo". Party given by Amer. Legion.

Sunday Nov. 5, 1944

Day off. Chief Ranger H.L. Bill relieving me at Yavapai. Sky partly overcast and quite winter. At the shop preparing specimens of moths from Clear Creek that were on spreading boards and accessioning new books received last month for Reference Library.

Monday, Nov. 6, 1944

Routine at Yavapai. Unloaded mail sacks of "Views from Yavapai" and "Grand Canyon Facts" and stored this printed matter in cabinets 3 and 4. Letter from Ms. Collum re agave of Clear Creek and milkweed. The agave is "Agave parryi", new for Park. Rain and snow at 2:45 p.m. First snow of the season. Completed October book sales and bank deposit.

Tuesday, Nov. 7, 1944

Election Day. Roosevelt and Dewey for the Presidency. Sky heavily overcast with rain and snow. On duty at Workshop. Supt. Bryant relieving at Yavapai. Made bank deposit for association. Attended cataloging and filing of fish specimens and trilobites returned from Mus. of No. Arizona. Mailed order slips for library catalog cards from the Library of Congress. Rain and snow ceased in the p.m. Franklin D. Roosevelt was again elected for the fourth term, defeating the Republican candidate, Dewey.

Wed. Nov. 8, 1944

Routine duty at Yavapai. In for staff meeting at 10:00 a.m. Weather clear and cold. The north rim white with snow. Letter notifying me that I am a member of the Boy Scout Committee to attend meeting Friday at 8p.m. Had to skin a Abert squirrel over at the Asst. Supt. Davis home. He wanted the meat. It was shot with a 22 cal. Rifle.

Thurs. Nov. 9, 1944

On duty at Yavapai Observation Station. The fish specimens arrived from the U.S. Natl Museum and of which

Bob Miller wrote some time ago. Returned to the Shop and made a study skin of the Albert squirrel skinned last night at Davis's. The underparts are dark, almost as dark as the belly of the Kaibab squirrel on the North Rim, hence its desirability as a specimen. It shows a connection between the North and South Rim squirrels. Catalog NO. M-511.

Tues. Nov 21st 1944

Relieved from Yavapai duty by supt. H.C. Bryant and worked on correspondence at Shop. Wrote Haring, Disher, McKee, Tempe St. college and Trask. Cleaned shop and placed Agave Parrii in press. Evening at Shop degreasing some entomological specimens. Received catalog cards from Library of Congress for Reference Library.

Thurs. Nov 23, 1944

At shop to attend stove. Then to Yavapai on routine station duty. THANKSGIVING DAY. All government employees working on holiday. Kodachromes taken in October on Clear Creek trip received, that is the 4th roll. All turned out well. A letter from Arthur Chavez, (a former CCC enrollee assigned to Naturalist Dept.) who is now a corporal with the Armed Forces in France. He served in Africa and Italy. A very fine letter. H.C.B. notified me he had word from Regional Office at Santa Fe to send me there for a month to prepare P.C.P. sheets on a Regional Workshop.

Fri. Nov, 24, 1944

Started to snow around 6 a.m. (MST) High winds. Routine duty at Yavapai. Had to place chains on tires. Stopped snowing around 10:15 a.m. High winds and cold. No attendance in a.m. Canyon most of day obscured by clouds. Good attendance at 3:30 p.m. talk. To scout meeting at 8:00 p.m.

Tues. Nov 28th 1944

Relieved from Yavapai duty to do work at Workshop by Asst. Supt. John Davis. Made signs and notices for public display of the change in hours at Yavapai starting Dec. 1st. Wrote letter to Regional Director for Supt. Sig-

nature on Grand Canyon Natural History Assn. annual report and close of the active year. Cataloged specimen of Abert squirrel prepared on the 9th and attended two entomological specimens captured earlier in the month. To Shop in evening from 7:00 p.m. to 9:00 p.m. on some filing work.

Friday, December 1st. 1944

Yavapai Observation Station closed in the a.m. starting this day. Attended stove at Workshop and then to Yavapai to attend stove and thermo. reading. Closed record sheets for month and posted new sheets. Brought in book sales fund for month. Attended close of month report on rain gauge for U.S. Weather Bureau and changed graph sheet. At work in a.m. at Naturalist Workshop on correspondence.

Saturday, December 2, 1944

A.M. duty at Workshop on monthly report. P.M. Yavapai duty. Evening to movie. Called from movie on phone and notified that Col. Elliot Roosevelt (son of the President of the U.S.) and his wedding party had arrived and to come to the El Tovar hotel to meet him and his best man Mr. Freye, Pres. Of the T.W.A. Airlines, to make arrangements for the wedding tomorrow. Mr. Stevens and I, together with Chief Ranger Bill, spent up to 12:00 a.m. with them. Took them to Community Building and then to Yavapai. It was decided to hold the wedding at 9:00 a.m. at Yavapai Observation Station. Pretty tired, hit the "hay" at 1:15 a.m. Supt. H.C. Bryant and wife and Asst. Supt. Davis and wife to leave early tomorrow for Kayenta, to attend the funeral of John Wetherill, Navaho trader and friend of the Park Service who passed away during the week at Ash Fork.

The bride: Film actress Faye Emerson. Matron of Honor: Mrs. Joseph B. Livengood. Maid of Honor: Elliotts daughter, Miss Chandler Roosevelt. Best Man: Jack Frye, head of Transcontinental & Western Airlines. Guests: Mrs. Frye, Miss Janet Thomas, Mrs. Clarence and Col. Shoop, Lt. Col. David Brooks and John Hoover.

Grand Canyon Historical Society

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New names in the above logs, not previously published; apologies where I have printed a name twice in former parts.

Guy Jackson—writer and/or photographer for *Arizona Highways*

Max Rae—a professor

Emery Kolb-- Canyon resident and explorer

Sonny Kolb—Emery's grandson

Edick--?—on the Clear Creek trip

Bob Miller--U.S. National Museum, on the Clear Creek trip

J. Brooks--?-- possibly James P. Brooks, Chief Ranger and sole survivor when Johnson and Sturdevant were swept away by the Colorado River in 1929.

Disher and Trask--?-- correspondents of Schellbachs

Arthur Chavez—CCC enrollee

Col. Elliot Roosevelt—son of President Roosevelt

Mr. Jack Frye—President of TWA

Mrs. Stevens-?

John Wetherill—Navajo trader and friend of the Park

Faye Emerson--Actress

Mrs. Joseph B. Livengood—Roosevelt wedding party

Chandler Roosevelt— Elliot Roos-

velt's daughter

Miss Janet Thomas—Roosevelt wedding

Mrs. Clarence—Roosevelt wedding

Col. Shoop—Roosevelt wedding

Lt. Col. David Brooks—Roosevelt wedding

John Hoover—probably John Edgar Hoover, the first director of the F.B.I., Roosevelt's wedding.

Other names mentioned from diary entries not selected:

Reverend Sawyer-?

J. Babbitt- probably one of the Babbitt brothers

Bill Dowling—was the purchasing clerk. He also typed songs and worked on GC plant checklists. His brother was killed in the war Sept 1944.

Chuck Sevey-- retired federal employee, worked on the Parks plant checklist

Miss Verkamp—member of the Verkamp family and local school teacher

Ms. Maw (sp) and Ms. Visel (sp)—Local school teachers

Corrections and/or additions:

Don Schellbach sent information on the name "Mrs. Spencer" in Part Two and Four. She was a relative to Fred Harvey. Her name was Mabel and her husband was Frank. They worked for Fred Harvey Co. managing the Hopi House. Schellbach said Fred Harvey originally came from England and he is guessing that the name "Shirley Jones" (found in Part IV) of England, could be a relative of his.

Lou Gastellem was the chief clerk and worked for purchasing clerk, Bill Downing.

Gordon Cox: his wife's name Helen, he was Chief Clerk of Region III in Santa Fe.

Fancher from part ONE, first name is Roy.

"Koons" from Part ONE could be spelled "Coons" and he was from Baltimore MD.

Look for diary entries from 1945 in a future issue of *The Ol' Pioneer*.