

Geology in the Land of Georgia O'Keefe

Trip Report Oct. 10-17, 2011

Guide Kirt Kempter with 6 participants: Cathy, Cathie, Don, Jan, Dwayne and Marj, and a visit from Narca Moore Craig and Peg Abbott, of Naturalist Journeys, LLC

Mon., Oct 10 Arrival in Albuquerque / Garden of the Gods

Five of our group met in Albuquerque today. Once underway we got right into the field, heading north towards Santa Fe with stops en route. Our first was an outstanding view of the mountains and surrounding terrain from the parking lot of the Sandia Casino golf course where Kirt talked about the rise of the Sandias and the extensive rift valley of the Rio Grande River. En route to Santa Fe we discussed some of the basic geology of New Mexico, including the formation of the mountains and the Rio Grande Rift.

From I-25 we took the Waldo Canyon exit, taking a back road to Santa Fe through the small mining town of Cerrillos. This

excursion has some spectacular roadside geology, including Garden of the Gods along Hwy 14. We learned about the ancient volcanoes that produced the Ortiz Mountains and Cerrillos hills. Also, we discussed the correlation of mineral deposits with volcanic activity, which produced turquoise and other minerals in the Cerrillos hills. The highway sign "Watch for Rocks" seems most appropriate.

We arrived in Santa Fe in the late afternoon and went directly to Hotel Santa Fe. After a chance to settle in, Kirt gave a lecture on plate tectonics and how this theory helps explain the modern landscape of New Mexico. The PowerPoint slides helped us visualize the theory on the landscape. Dwayne and Marj, being local, then caught the commuter train back to Albuquerque with plans to meet us the next day. We had dinner at one of Santa Fe's most popular New Mexican restaurants, Tomasita's, very near the hotel.



Tues. Oct. 11 Faults , Fractures Fissures and Fans

We woke and made our way to the hotel's welcoming lobby where they had a real wood fire in the fireplace, and we enjoyed the smell of pinyon over coffee and breakfast, a nice buffet. Our destination was Kasha-Katuwe Tent Rocks National Monument via I- 25 Hwy. 16 and Hwy. 22, about 40 miles southwest of Santa Fe. En route we discussed more of the geology between Santa Fe and the Jemez Mountains to the west.



At Tent Rocks we met up with Dwayne and Marj. In the parking lot Kirt gave a short presentation on the geology of Tent Rocks before starting our hike. We took the impressive Canyon Trail, a 3-mile route that leads through a spectacular slot canyon up to a high vantage point overlooking the region. We learned about the life and death of Bearhead Volcano, active in the southern Jemez Mountains around 6.8 million years ago. We also learned about the formation, the tent rocks and the processes of erosion that led to the bizarre hoodoos within the monument. Kirt distributed a geologic map publication of Tent Rocks to the group (co-authored by Kirt and published by High Desert Field Guides). One of the highlights was viewing the seven dwarfs, hoodoos that occupy the upper end of the Canyon Trail. We approached the Seven Dwarfs from below and wound around them on the ascent, finally looking down on the capstones and the conic shapes. Along the trail we ducked and scrambled through the slot canyon, and we practiced identifying the geologic formations and effects that we had been learning.

Back from the summit we enjoyed a picnic lunch a la Trader Joe's, assembled by Kirt. Then it was on to more adventures. Highlights included obsidian tears in the creek beds and a lively discussion of faults, fractures, fissures and fans. We found four tarantulas on the drive which inspired a picture or two. New words and concepts emerged for us to learn – tephra, pumice, and pyroclastic flow. Dwayne proved to be excellent at finding faults, a trait identified by the group, which led to a raised eyebrow by his wife. We tried to imagine Kirt's description of tuff and tephra from a volcanic vent sent high to the sky, particles exploding like popcorn, porous and light, falling like snow. Some of the layers appeared like a pillow rounded out towards us, and we joked that if you see tephra falling, move rapidly elsewhere, as it's often followed by a pyroclastic flow.

Surrounded by so much scenery to interpret, Don labeled Kirt a walking encyclopedia about geology. Kirt on the other hand, struggled to keep us on task; with so many small flowers and large vistas inspiring questions, he urged us to learn the landscapes stories and (we joked) "focus on the rocks". In that late afternoon time when all lose their focus, we went for beers, cokes and lemonades at a biker bar in Madrid. The maître de had white hair in a butch haircut, and she ran a tight ship by being both tough and beautiful. We admired her flat crew top and tattoos. Jan noted a road sign as we left that said "old hospital road", and another just below it said "dead end".



several small beaver ponds. Two American Coots and a few red-winged blackbirds occupied the largest pond, which was



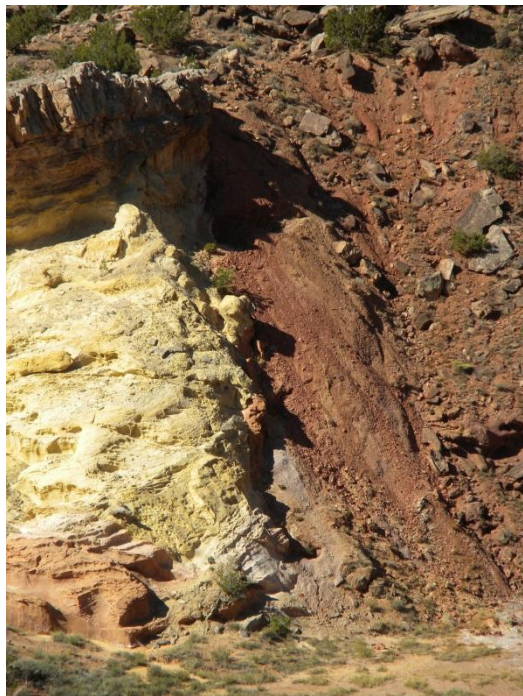
After poking around a bit in this historic mining town, we returned to Santa Fe, and went to dinner at Mucho Gusto.

Although Don claimed that might be enough New Mexican style food for a while, still we noticed that he ate every bit of his chimichanga.

Wed., Oct. 12 Santa Fe - Two Mile Reservoir / Randall Davey Audubon Center / Georgia O'Keeffe Museum and free time in the plaza

Today we stayed close to Santa Fe, spending the morning on a hike at Two Mile Reservoir on the edge of the city. This was a lovely circle hike past several small beaver ponds. Two American Coots and a few red-winged blackbirds occupied the largest pond, which was

formed by man, not beaver, although there were signs of both. The hike took us along superb exposures of 1.6 billion year old granite, which makes up the core of the southern Sangre de Cristo Mountains. Farther along the trail we observed the Great Unconformity, where ~340 million year old limestone overlies the ancient granite. Missing at that boundary is ~1.3 million years of geologic history. The Great Unconformity occurs throughout the American southwest, indicating that pervasive erosion for hundreds of millions of years wore down the landscape to sea level at one point (or eon) in time.



Coming back from the hike, we stopped in at the Audubon center, where the person who signed in the guest book just ahead of Cathy, lived twenty miles from her at home in Maryland - small world. Dark eyed Juncos, White-crowned Sparrows, and Ruby-crowned Kinglets were active in the shrubs.

After our hike we enjoyed lunch at Vinegrettes, where Jan, happy not to have Mexican food, got lots of onions (which she HATES), so atypical in her Greek salad. The rest of us had less challenges, and enjoyed a delicious, healthy lunch. Then we went to the Georgia O'Keeffe Museum where everyone had time to browse. Cathy appreciated much of O'Keeffe's early work such as "clam and seaweed". We went to museum's movie about O'Keeffe coming to New Mexico, then a second movie with a voice over, speaking her words. Jan liked a close-up drawing of Datura. Kirt pointed out several of the paintings that included Cerro Pedernal, a prominent butte in the Abiquiu region that Georgia painted often. Along with paintings by Georgia, there was a guest exhibit of an Irish painter, featuring both portraits and landscapes. Kirt then turned everyone loose to explore the plaza and its myriad shops, adobe buildings, and covered walkways. Cathy strolled up Canyon Road, poking in galleries, orienting her way back to the hotel by following

the river. We all enjoyed dinner in the hotel this evening.

Thur., Oct. 13 Santa Fe to Abiquiu / Valle Caldera / a Tough Walk in Tuff

We enjoyed one more breakfast in the cozy lobby of Hotel Santa Fe, then drove westwards towards the Jemez Mountains. At Los Alamos we took a short break to visit the Atomic History Museum and the Otowi bookstore. From Los Alamos we continued westward on Hwy 4 up and over the rim of the Valles Caldera, a giant volcanic crater left behind from a massive eruption 1.25 million years ago. The

caldera is spectacular, including mountains

draped with fir and pine trees, and broad grassy valleys. We spotted three herds of elk, about 50 in all. The largest fire in New Mexico history, the Las Conchas fire, burned a portion of the caldera, and we were able to see the starting point of the fire near a campsite called Las Conchas. The caldera has been federally protected since 2000, with the creation of the Valles Caldera National Preserve. Kirt informed us that New Mexico senators are hard at work trying to create a new national park that joins the preserve with Bandelier National Monument.

We looked at mosaic patterns of the Las Conchas burn, which started when a tree fell on a powerline.

The flames went uphill and then spread widely responding to the extensive drought conditions. Kirt said that at times at night from Santa Fe, the fire looked like an erupting volcano!



We had lunch at the Ridgeback Café in the community of La Cueva, which one would hesitate to describe as a town, having just two to three buildings. We watched them putting up their Halloween decorations, rustic but fun. From here we retraced our steps across caldera and went to Bandelier National Park, known for its archaeological cliff houses and treasures. While the main part of Bandelier was closed, we went to Tsankawi, an ancestral puebloan village in a remote section of the park.



Here we went for a 2-mile hike, exploring foot trails worn into the tuff, and climbing a ladder to reach a higher mesa. Jan said she was grunting and groaning, but it was well worth it to see old cliff dwellings, natural caves (one blackened inside), and petroglyphs along the way, one of Kokopeli the well-endowed flute player and one of a cute little fat guy with bowed legs. The source of water for early cliff dwellers was the river below, but they lived above the flood plains, needing to save irrigated land for gardens. This trail had funny sections, such as one with knee high slots with rounded edges, where we navigated passage placing one foot in front of the other. It was sculpted, carved in the tuff. Two others joined our group this evening, Cathie and Narca met the group in Abiquiu this evening for dinner. Being late in the fall, birds were few, though throughout the day we enjoyed views of Pinyon Jays, and Common Ravens.

We were very pleased with accommodations at Abiquiu Inn, where beautiful cottonwood trees, aflame with color, arched over the drive. The Inn is a few doors down from one of Georgia O'Keeffe's homes. We had outside patios looking off to Georgia's favorite hills, across the river. The dining room was

cozy and southwestern, with a nice selection of entrées, and the rooms had nice little gas fireplaces, great for atmosphere as well as taking off the chill.

Fri., October 14 Hikes near Abiquiu / Ojo Caliente Hot Springs / El Rito

This morning our group traveled west of Abiquiu to a small canyon called Red Wash canyon. This canyon runs along the geologic boundary of the Rio Grande Rift and the Colorado Plateau. On one side sedimentary rocks from the Mesozoic Era, colorful strata typical of the Colorado Plateau. On the other side of Red Wash we were in the Rio Grande Rift, with much younger sedimentary rocks that lacked the color of those on the Colorado Plateau. A major fault, the Cañones fault, defined the boundary between the two geologic provinces.

Our hike took us to a high overlook of a much larger canyon called Cañon de Cobre, where Spanish settlers mined copper in the late 1700s and early 1800s. We enjoyed a picnic lunch overlooking the magnificent Cañon de Cobre to the north and the Rio Chama valley to the south. The landscape features graded from reds to pinks to golds and yellows, up to white, being topped by gypsum layer known as Todilto. We enjoyed a chorus of Townsends Solitaires' ringing resonant calls as we examined a fault running right down the wash and a marvelous dark basalt dike cutting across the hillside. Red-tailed Hawks were the most



common raptor we saw this week, and we enjoyed one this morning, hanging on the wing up ahead. We found battling Tarantulas, this time fighting over burrows. And we admired and photographed pretty, late season flowers, including Blue Bowls, *Gilia rigidula*, and a lovely senicio. There were several yellow composites, the most brilliant being Chamisa or Rabbitbrush.



In the afternoon we visited two amazing sites: an ancestral ruin named Poshuoiunge and Plaza Blanca, also known as "The White Place". Plaza Blanca is a spectacular canyon of white sedimentary strata that is undergoing rapid erosion, forming intricate hoodoos and cliff walls. Georgia O'Keeffe loved this canyon, and at least four of her well-known paintings depict this landscape.

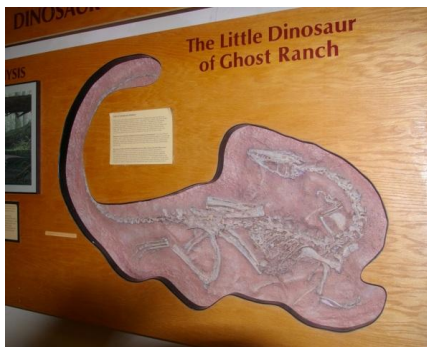
Lastly, we visited Napoleon Garcia in the town of Abiquiu. Napoleon was a child living in Abiquiu and was often hired by Georgia for yard work, errands, and other chores. He has written a book about his life experiences, including many memories of his time with Georgia. Napoleon is also an elder in the Abiquiu community and was able to give us wonderful insight into the local culture, including Los Penitentes, an offshoot of the Catholic religion in northern New Mexico. He described the Spanish land grant that to this day protects the source of the village's water in the hills above the town. Several of us bought his book "The Genizaro and The Artist", and Don got a head start on reading it pronouncing it quite entertaining.



In the evening we had an excellent dinner at the Abiquiu Inn and enjoyed reviewing the day's activities and sights.

Sat., Oct. 15 Hikes and Geology around Ghost Ranch

Today we headed west from Abiquiu onto the Colorado Plateau, where dinosaur-age strata wrap around a broad, stunning basin, termed Piedra Lumbre. Georgia O'Keeffe also lived in this area, at an old dude ranch named Ghost Ranch. Today the property is owned by the Presbyterian Church, although it is primarily run as an educational retreat center. We took a 3-mile round trip hike to Chimney Rock, a prominent rock feature that stands above the Piedra Lumbre. The hike took us through colorful geologic strata of the Triassic and Jurassic periods from the Mesozoic Era. The most spectacular strata belonged to the Entrada Formation, fossilized sand dunes from ~180 million years ago. Resting at the top, a Peregrine Falcon whizzed by the cliffs below us without a sound, wow! We enjoyed a picnic lunch at the peak of the hike, adjacent to Chimney Rock.



In the afternoon we visited the paleontology museum, which included amazing fossils of Coelophysis, one of the first dinosaurs and found by the hundreds in a particular layer at Ghost Ranch. These amazing fossil finds led to the site being designated a United World Heritage site. Before our return to Abiquiu we visited Echo Amphitheater, where the Entrada Formation formed a gigantic lateral bowl into the cliffs. Lastly, we stopped at a scenic overlook of the Rio Chama, perched on the edge of the Colorado Plateau, looking into the Rio Grande rift and the autumn colors of the river cottonwoods. We had a two o'clock tour of Georgia O'Keeffe's home, a lovely experience with an interesting local guide and a small

tour group. Her home is totally unassuming, but her essence is in evidence throughout. The furnishings are sparse, and the art is that of nature and architecture - the views of rocky hills, the angles of the buildings. She woke facing east, and the light on this landscape was surely inspiring.

That evening we enjoyed a classy meal at Rancho de San Juan, a 4-star bed and breakfast about 15 miles east of Abiquiu. We arrived early in order to explore the sandstone shrine, an amazing artwork of rooms sculpted into the Ojo Caliente sandstone. The trail to the shrine was deeply eroded and in poor condition, making this visit more difficult than planned. This unique feature

will likely not be open for visitation in the future as the property is for sale and the path to the shrine continues to worsen. As we walked to the cars after dinner we were serenaded by several coyotes which seemed to respond even more loudly to Peg's calls to them.





Sun., Oct. 16 Taos / Posiouinghe / Rio Grande /
 On our last day we traveled to Taos. Our route took us along the Rio Grande, through a spectacular gorge, gradually rising to a vista of the Taos Plateau. Here we stopped for photos and purchased some piñon nuts from a roadside vendor. With the flaming yellow of the cottonwood trees, we couldn't help but stop for photos of the "Bosque," the riparian corridor along the Rio Grande. We stopped again for photos of the colorful apples and pumpkins at a roadside stand – then couldn't help but buy a sampling. Upon our arrival in Taos, we stopped at the famous Rancho de Taos church, photographed by Ansel Adams and painted by Georgia O'Keeffe. Deeper into Taos we reached the plaza, where a few hours of free time were provided to let folks eat, shop and browse.

Following our free time in Taos we departed, heading west on Hwy 64, to a bridge crossing the Rio Grande Gorge. Here the Rio Grande has formed a canyon over 600 feet deep, with a picturesque inverted suspension bridge. Walking across the bridge is an adventure in sight and steadiness, as impressive views were accompanied by a jiggling bridge, shaking with the passage of each large vehicle. Amazingly, we spotted big horn sheep far below us on the cliffs just above the river. Really!



En route to Abiquiu we stopped at Ojo Caliente and took a 2-mile round trip hike to Posiouinghe, another large ancestral puebloan ruin on an old river terrace above the Rio Ojo Caliente. Pottery shards were everywhere, and it was easy to see the outline of the pueblo walls, the central plaza, and the primary kiva. Originally, we were going to soak in the springs, but our time was short, and the springs were expensive, so we decided to return to the Inn, stopping at an authentic Mexican food restaurant in a small town en route.

Here, we thoroughly enjoyed each other's company, tales of the week, impressions of the countryside, its geology and Georgia's art. This landscape leaves indelible images, and we were very pleased to explore it in detail.



Mon., Oct. 17 One last view... / Departures from Albuquerque

This morning we enjoyed a last good breakfast (corn cakes with piñon nuts, wow!) Before heading south to Albuquerque where we would all head for home, Kirt took us to see his home-building project quite close to Abiquiu Inn. We smiled to see that he chose a property with a stunning view, geologic features all around and a view of Pederal. This was a super week and we look forward to next year's journey!



Last morning view, Kirt Kempter

Other Photos:

Don Allen: Bandolier sign page 3, all photos page 5, first three photos page 6, tree leaning into rocks and Indian Paintbrush page 7, most photos page 8

Cathy Cooper: Page 1 and 2, first two photos page 3

Peg Abbott: photos page 4, chilies page 6, river scenic page 8

