

Ogden Rock and Gem Club



Beehive Buzzer

May 2013 Volume 41 Issue 5



This Month:

Geology of Utah Continued...

Issue Highlights...

Board Meeting Notes	2
Calendar and Show Dates	2
Grouse Creek Trip Report	3
Henry Mtns Field Trip Info	4
Topaz Mtn Field Trip Info	5
Rockin' Thru Utah, Part II	6-9
Upheaval Dome	10
Cool USGS Map Website	10
Officers/Club Info	11

Note from our Field Trip Leader:

We have two exciting field trips planned in the next few weeks. In the event my back problem worsens, I may need someone to lead these trips. If you are willing to volunteer for either trip if the need arises, let me know.

Joe Kent, 801-540-8596

Club Notes:

- July board meeting changed to July 11.
- Two field trips coming up... Henry Mtns and Topaz Mtn.
- Remember to RSVP Joe Kent before each field trip.

Beehive Rock & Gem Club Program

Thursday, May 23, 2013 – 7 pm



Our main program will be a presentation on Rock Tumblers and polishing by a prior president of the Wasatch Club.



There will also be rock items for sale

Info on the Field trip to Henry Mountains will be available

“Rocky” Ray, Program Chairman

7” Beehive Rock & Gem Club Patches for \$15

The club has put in an order for the large 7 inch club patches from an inexpensive source. They cost only \$15.00. In the future they will cost significantly more. They are beautiful! You might have seen one on the back of a member’s club vest. You can buy them at the club meetings or contact a member of the board. They will be sold until they are gone. An example of an actual sized patch is shown as the background on this page. (The background image of the patch shows up in the electronic version of the Buzzer but for some reason I cannot get it to print. For those with the hardcopy version, the size is shown in the right margin and an image of the patch is shown in the lower left corner of this page. Editor)

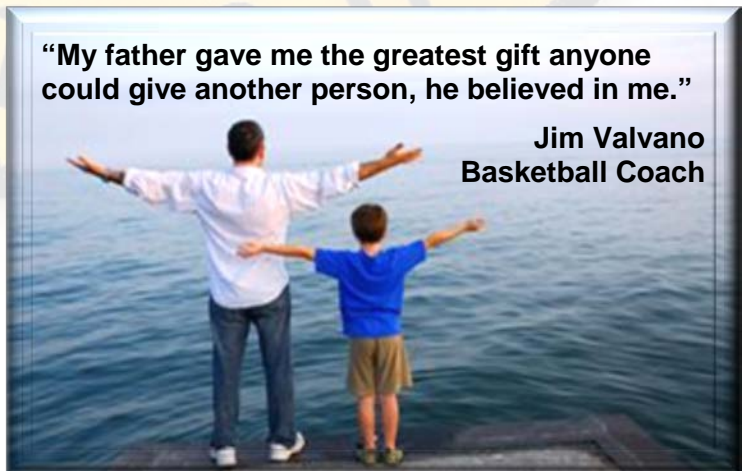
7”

CORRECTION

I incorrectly published the cell phone number for Joe Kent, our Field Trip Leader. The correct number is **801-540-8596**. Sorry if it caused any inconvenience. I am sending an updated field trip list with the correct phone number. Editor.

“My father gave me the greatest gift anyone could give another person, he believed in me.”

Jim Valvano
Basketball Coach



Calendar**May****23**

Monthly Club Meeting
Roy Municipal Center
7 pm

24-28

Henry Mtns Field Trip

27

Memorial Day

June**6**

Board Meeting
Roy Library
7 pm

7-9

Topaz Mt Field Trip

14

Flag Day

16

Father's Day

27

Monthly Club Meeting
Roy Municipal Center
7 pm

July**11**

Board Meeting
Roy Library
7 pm

4

Independence Day

19-21

Cedar City Field Trip

24

Pioneer Day

25

Monthly Club Meeting
Roy Municipal Center
7 pm

Beehive Board Meeting Notes**May 2, 2013**

Steve Smith conducted the meeting. 11 people attended. Board Members mentioned the last Club meeting and how nice it was after it was over to sit and visit for a while. Joe gave a trip report of last weekend's trip to the Grouse creek area. The Board discussed Club Rules and it was mentioned again that if a person wants to come on the field trips, they can attend 2 before they need to become a member. The Board then talked about the upcoming Club Meeting and the big Annual Spring field trip to the Henry Mountains. The Club meeting will be by Jeff Huffner and will be on Tumbling and Polishing Rocks. Joe has set the "official" dates for the Henry Mountain trip to be from Friday, May 24th, to Tuesday, May 29th. We will be staying at Starr Springs again, and a map will be sent out before the trip. The Board went through the list of Members that is maintained by the Alexanders. They do a great job with this list. Discussion came up about who qualifies for an Honorary member, and how long to keep the people on the books who haven't paid dues, and we haven't seen in a while. Reluctantly, a few people were removed from our list.

The Club now has the large Embroidered Patches available now thanks to a lot of work from Linda. They are \$15.00 each, until this supply runs out, then they will be \$20.00 each. These are really high quality and very nice. The club did well on its annual Auction meeting, and everyone is enjoying the table of things for sale that is being set up at our monthly meetings. Watch for the Buzzer to get more details on our Spring Trip – and thanks to everyone for all you do, especially our Club Members!!

Dave Offret, Club Secretary

July Board Meeting Change of Date

The July Board Meeting has been change to Thursday, July 11 due to Independence Day

Show Dates**June**

21-23—SANDY, UTAH: Wholesale and retail show; Gem Faire Inc.; South Towne Expo Center; 9575 S. State St.; Fri. 10-6, Sat. 10-6, Sun. 10-5; adults \$7 (3 days), children (11 and under) free; jewelry, gems, beads, crystals, silver, rocks, minerals, more than 70 exhibitors, jewelry repair while you shop; contact Allen Van Volkinburgh, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

Check <http://www.rockngem.com/show-dates-display/?ShowState=ALL> for other shows throughout the country.

"...the beehive state, might also be called the bedrock state. Probably no area of similar size in the nation displays more of the raw, unobscured rock formation...Utah is...a geologist paradise."

William Lee Stokes, Geologist

Zion National Park

Photo Credit: NPS



Grouse Creek Trip Report April 26-28 2013

I arrived at the designated camp at about 10:30 PM Thursday and found the Wallaces had already arrived and set up camp.

On Friday morning we went exploring first to the variscite and found that the access up the hill as viewed from Hi-way 30 has been blocked at the top of the hill. We then ventured to the north to find the access to the chert and geodes. I knew which hill they were behind but couldn't remember the correct roads in from the hi-way. After wandering across the pipeline scar, some un-posted private property we finally arrived at the right spot. We looked around briefly then headed back to camp arriving a little late 1:30. A number of folks had arrived and already headed out to Crystal Mountain. At least that is what the new BLM sign is calling the area.

Many of the trails into the Devils Play Ground area appeared to be freshly graded and I noticed some of the gates along Hi-way 30 have similar new signs. One of these was freshly graded and provided access to the Devils Play Ground Area. The Wallaces were going to explore this on Saturday afternoon.

Saturday morning we lined up and had a quick orientation meeting and then departed for the chert. There were 13 vehicles in the convoy with an equal representation of people from both the Beehive and Golden Spike clubs. We spent about 90 minutes in this area before moving north to gather Geodes in the west side of the saddle. I scouted the other side of the saddle and found the road too rough and the area too restricted for a group of our size.

The group then moved out to Grouse Creek Junction. Bill Daylong agreed to show the group the access to the Variscite pit from the Owl Springs side. Due to the pain



caused by piriformis syndrome in my left hip I took my leave and returned to camp and then home.

The report that I received on the Variscite was that recent activity in the pit had exposed an abundance of excellent material.

Respectfully Submitted, Joe Kent, Field Trip Leader

Not included for posting in the club news letters but for historical reference those in attendance. Beehive: Ray Law, Ray Rutledge, Dennis and Nancy Anderson, Bill and Teffa Daylong, Roger and Sheri Bush, Michael Wolsey and son, Linda Pilcher, Kathy Rosenbaum, Joe Kent --- Golden Spike: Buck Frost & Brenda Watkins, Pat and Alan Wallace, Janice Burk, Diane Collins and Husband, Jim Shipp, Kyle Tumpane, Joe Schlagenhaft, Terry Wilberg, Jim Kwicely, Tony Hyte



2013 Field Trip Schedule

Henry Mt. — May 24- 28

Topaz Mt. — June 7-9

Cedar City. — July 19-21

Salina. — August 16-18

Texas Springs, Nevada.— August 30- Sept 2

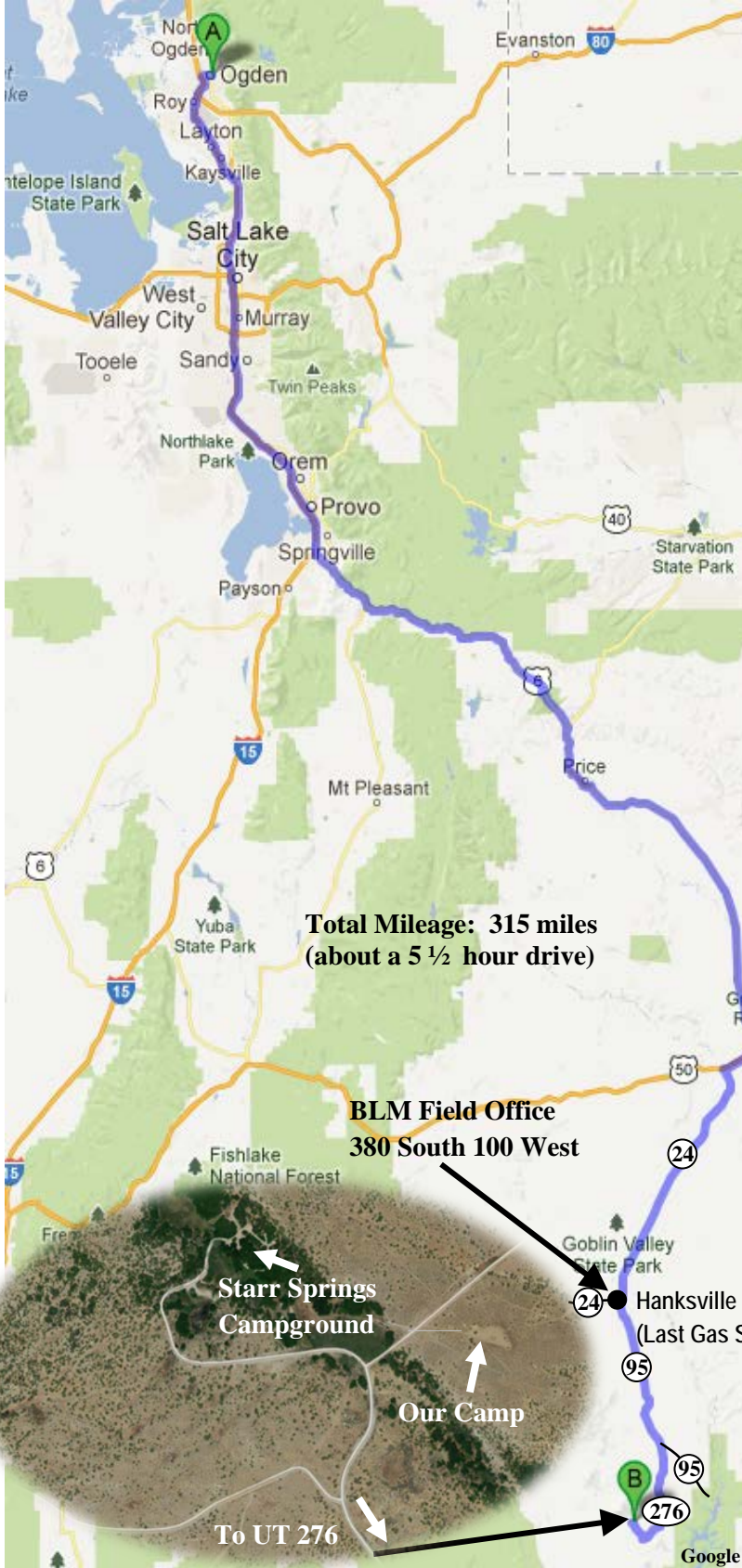
Gardner Canyon, Wyoming — September 20-22

Floy Wash. — October 11-14

Remember to RSVP to Joe Kent for each field trip.

Photos: Joe Kent

Henry Mountains Field Trip May 24-28, 2013



Total Mileage: 315 miles
(about a 5 ½ hour drive)

BLM Field Office
380 South 100 West

Starr Springs
Campground

Our Camp

To UT 276

Hanksville
(Last Gas Stop)

Google Maps

Here are the general directions and mileages to the Starr Springs Campground where we will be staying:

Take I 15 south to Spanish Fork Exit 257 B to Price on US 6, Continue on US 6 to Interstate 70 this is about 120 miles.

Go West On Interstate 70 towards Salina, at about 8 miles take exit 149 toward Hanksville.(about 50 miles)

At Hanksville go Left on UT 95. Continue South on 95 for about 26 miles to UT 276. Turn right on to 276 and go about 17 miles to sign announcing the Starr Springs Campground. Go up the road about 3 ½ miles. There are only about 6 camp sites in the camp ground. We take the fork to the Right about tenth of a mile then Right off the road into a large clearing where we usually camp. This is a "dry camp".

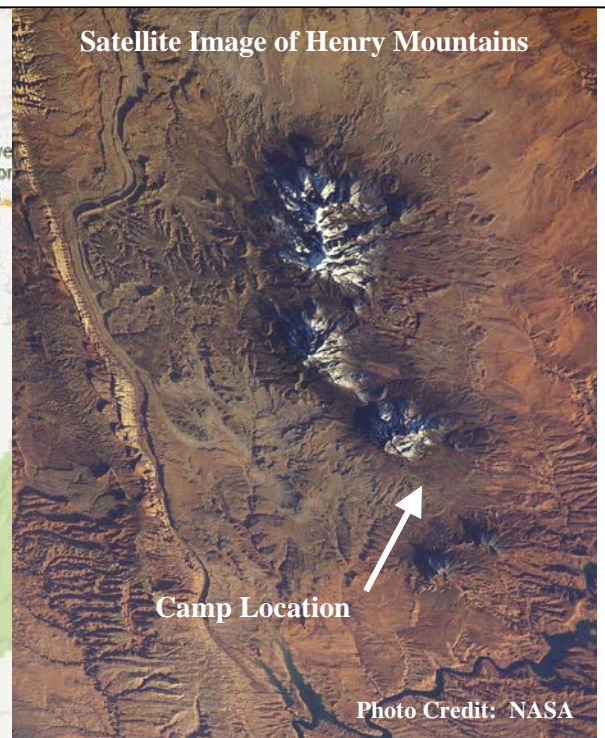
The Water is now on in the Starr Springs Campground and there are the usual toilet facilities there. Water is available at the BLM Field Office in Hanksville 380 South 100 West. This is where I usually fill my trailer tank. They also have maps of the area. Don't mention the group gathering.

At this time there is no specific daily trip agenda. I will arrive some time the 24th and may stay through the 29th

RSVP at 801-540-8596 or joekent225@msn.com.

Thanks, Joe Kent, Field Trip Leader

Satellite Image of Henry Mountains



Camp Location

Photo Credit: NASA

Topaz Mountain Field Trip

June 7-9, 2013



Total Mileage from Ogden: 195 miles
(about a 3 hour 15 minute drive)



Directions to Topaz Mountain:

Hopefully you can find your way to Nephi. Turn off I 15 at Exit 225 and go west on UT 132 to Lynndyl, UT about 33 miles. Turn Left (South) on US 6. On the south end of town is the last place to get gas. About 5 miles out of town turn Right (West) on UT 174 the Bush Wellman Rd. At about 35 miles on UT 174 there is an unmarked dirt road to the left (south). We have called this the Joy Road. If you get to the sign for Topaz Mtn you have gone too far—go back 2 miles. There is a track off the Joy road to the right at about a mile, camp on the flat 150 to 200 yards off the road.

There is a Wendy's in the Phillips 66 gas station on the south side of 100 North in Nephi. Behind the station on the west end there is a water faucet. This is usually where I fill my water tank.

RSVP at 801-540-8596 or

joekent225@msn.com

Thanks, Joe Kent, Field Trip Leader



If Spring Showers Bring May Flowers, What do May Flowers Bring?



Pilgrims!

Rockin' Thru Utah, Part II

Dr. Mike Nelson

Part I of my Utah trilogy, published in the March RMFMS newsletter, introduced readers to the general geology of Utah as well as to the Uinta Basin section of the Colorado Plateaus. This month will continue with additional information on the Colorado Plateaus, especially on southeastern Utah and the central Utah San Rafael Swell.



Fig. 1. Location map of mountain ranges associated with laccolithic centers in the Colorado Plateau. The Four Corners is represented by the red dot. L, la Sal Mnts; A, Abajo or Blue Mountains; S, Ute Mnts; C, Carrizo Mnts; H, Henry Mnts; N, Navajo Mnts. Photo from NASA Visible Earth Project.

in the annals of the U. S. Geological Survey (USGS), Grove Karl Gilbert in his monograph (1877), *Report on the Geology of the Henry Mountains*. At the time Gilbert was working for the “Powell Survey”, one of the early USGS surveys designed to study the geology of the “American West”, and Gilbert was assigned to map the Henry Mountains, the last major mountain range to be “discovered” in the lower 48 states. Gilbert noted in the Monograph introduction that, “...the Henry Mountains have been visited only by the explorer. Previous to 1869 they were not placed upon any map, nor was any mention made of them.” Gilbert also believed these island mountains were different, not really a chain, and maybe just a group of five individual mountains (Mts. Ellen at 11,522 feet, Pennell, Holmes, Hillers, and Ellsworth). Furthermore, he stated that instead of rising [the magma]



Southeastern Utah is a special land, one of few inhabitants but of spectacular scenery and geological landscapes. Of special interest to many scientists are a group of scattered and isolated mountain chains known as the laccolithic centers of the Colorado Plateaus (Fig. 1). Laccoliths are igneous intrusions that have been injected into layers of sedimentary rocks and have pushed up the overlying rocks into a dome (Fig. 2). The name, laccolite, was first coined by one of the most famous geologists in the

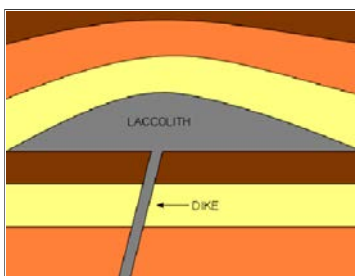


Fig. 2. Cartoon showing an idealized laccolith intruding into sedimentary rocks. Sketch courtesy of Wikipedia.

through all the beds of the earth's crust it stopped at a lower horizon, insinuating itself between two strata, and opened for itself a chamber by lifting all the superior (overlying) beds. Gilbert called this type of igneous formation a laccolite, currently known as a laccolith. Today, erosion has stripped off the overlying sedimentary rocks and the core diorite (dark gray igneous rock with large amounts of plagioclase feldspar; emplaced ~20-29 Ma; Sullivan, 1997) is exposed with the tilted sedimentary rocks cropping out on the mountain flanks. As in Gilbert's Day, the Henry Mountains are still one of the most isolated ranges in the lower 48 states (Fig. 3).

After Gilbert's work geologists then begin to describe other laccolithic centers in the Colorado Plateaus—the La Sal, Abajo, Carrizo, Ute Mountains, Navajo Mountain, Ophir-San Miguel-Klondike Ridge

(Mutschler and others, 1997). All of these laccoliths have the igneous rocks exposed in the center with the exception of Navajo Mountain on the Utah-Arizona state line. At that locality, which is a single domed peak (10,388 feet), the overlying sedimentary rocks have not been eroded away to expose the underlying igneous rocks (Fig. 4). The grandest laccolithic center of the Colorado Plateaus is the La Sal Mountains near Moab, Utah. Mt. Peale at 12,721 feet is the highest of this large group of peaks although 11 other peaks have elevations in excess of 12,000 feet. The mountains are impressive



Fig. 3. View, in 1953 of Mount Holmes in the Henry Mountains with a core of diorite and upturned Jurassic beds along the flanks. Photo courtesy of USGS.



Fig. 4. Navajo Mountain with part of Lake Powell in the foreground. Photo courtesy of Wikipedia.

and can be seen from tens of miles distance. The magma, now the rocks diorite and rhyolite, was emplaced around ~28-29 Ma (Sullivan, 1997). The peaks are especially scenic when viewed from Arches National Park to the north (Fig.5).

Immediately to the south of the La Sal Mountains is Lisbon Valley containing the Lisbon Valley Anticline, a large salt anticline where the dipping beds are due to movement/solution of salt in the subsurface (rather than compressional tectonic events). Several of these salt structures are found in the greater Paradox Basin (an evaporate basin in Utah and Colorado near the Four Corners). Although the Valley has several tens of

producing gas wells, the most active mineral commodity



Fig. 5. La Sal Mountains as seen from Arches National Park.

has been the numerous uranium mines (earliest report in 1913) and the area is undergoing uranium resurgence today. Target zones have been, and still are, the Cutler Formation/Group (Permian), the Moss Back Member of the Chinle Formation (Triassic), and the Salt Wash Member of the Morrison Formation (Jurassic) found along the flanks of the anticline (Fig 6).



Fig. 6. Satellite image, oblique view, of Lisbon Valley looking northwest down the strike of the Lisbon Valley Anticline. Photo courtesy of Mesa Uranium Corporation.

Copper also is present in varying quantities and qualities in Lisbon Valley and has been periodically mined for decades. Most of the paying copper deposits seem to be in the Dakota Sandstone and Burro Canyon Formation, both Cretaceous in age—therefore, younger and above the uranium beds. Most of the copper ore is chalcocite (Cu_2S) deposited by solutions brought up along the Lisbon Valley Fault (found along the crest of the anticline with offset approaching 4000 feet). With time chalcocite oxidizes to such secondary minerals as azurite [$\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$] and malachite [$\text{Cu}_2(\text{CO}_3)(\text{OH})_2$], both copper carbonates, (but note that azurite commonly pseudomorphs to malachite), and tenorite [CuO] and cuprite [Cu_2O], both copper oxides (SRK Consulting, 2006). See February 19 posting Copper Rivet Mine at www.csmgsgeologypost.blogspot.com

One of the earliest mining areas in the Lisbon Valley/La Sal District was originally organized in 1892 and generally goes under the name of Big Indian Copper Mine with later mines and claims termed Blue Jay Claim, Blue Grotto Prospect, Nevada Claim, Blue Crystal Mine, and the Texas Claim. A copper processing mill was constructed in 1918 and mining continued sporadically for several decades. The ore body is comprised of oxidized copper minerals (see above) emplaced in the Cretaceous Dakota Sandstone along the downthrown side of the Lisbon Valley Fault; mining has

been via open pit and tunnels. In the late 1970's, prospectors begin to notice beautiful azurite crystals and specimen collecting went into operation. For example, in 1988 a cut on the Nevada Claim produced one hundred thousand specimens of azurite rosettes (for collectors) and 6000 pounds of broken nodules for paint pigment. Today the claims are generally referred to as the Blue Crystal Mines and the company offers mineral collecting on a fee basis through tours arranged by Rockpick Legend Company in Salt Lake City and Deep Desert Expeditions in Moab. Besides the abundance of azurite, other minerals collected from the claims and mines include: Wulfenite, Tyrolite, Tenorite, Tennantite, Sphalerite, Quartz, Pyrite, "psilomelane", Olivenite, Malachite, Kaolinite, Goethite, Enargite, Djurleite, Diginite, Cuprite, Covellite, Cornwallite, Copper, Conichalcite, Clinoclase, Chrysocolla, Chalcopyrite, Chalcophyllite, Chalcocite, and Calcite. Information in this paragraph came from an article by Arnold G. Hampson (1993).

During a small expedition in the latest 1970's (maybe earliest 1980's??), I was able to collect numerous representatives of copper minerals; however, after several house moves and "giveaways"—I have three remaining specimens. Fortunately I was able to keep one cluster or rosette and one "blueberry" of azurite and one small mass of malachite. The most unique of the specimens collected at the Blue Crystal Mine, then and now, are the "blueberries", small (up to 5mm) concretions, often hollow, of micro-sized azurite crystals; some contain tiny rounded quartz grains mixed with azurite (Fig. 7). I have not been able to locate information on their formation; however, it appears that tens of thousands of these "blueberries" have been collected over the decades. Rockhounds in Utah tell me that the mine is the single world source for these unique specimens; however, I have seen similar/almost identical specimens from the El Chino Mine in New Mexico.



Fig. 7. Azurite crystal cluster left (3 x 2.6 cm) from Blue Grotto Prospect, La Sal/ Lisbon Valley District. Photo courtesy of Kevin Conroy. Azurite blueberries, right. Photo courtesy of Blue Crystal Mine.

The "azure colored" rosettes and crystal clusters "commonly occur as 3-8 cm rosettes of subparallel crystals and as individual azurite crystals to 2.5 cm in length" (Hampson, 1993). The blueberries are much lighter in color, perhaps a sky blue.

Nearby is one of my favorite small communities—Moab, a Colorado Plateaus town located on the east bank of the Colorado River in the Grand Valley, Utah, and the County Seat of Grand County. It was first populated by permanent (Caucasian) settlers around

1880, mostly Latter Day Saints doing farming and missionary work. The first “mineral boom cycle” in the region was triggered by the need for radium and vanadium during the years prior to World War II. A few oil wells were producing in the 1950’s but the need for uranium to fund the Atomic Energy Commission (AEC) projects created a much larger boom in the late 1940’s and 1950’s and brought thousands of prospectors, miners and merchants to town, including a “rags-to-riches” Texan by the name of Charlie Steen. His discovery, in 1952, of the Mi Vida (My Life) mine triggered a “uranium rush” to the Colorado Plateau that rivaled the fabled gold rushes of the 1800’s. *“School teachers, insurance brokers, used car salesmen, and shoe clerks around the nation converged on the Colorado Plateau to seek their fortune. Even a group of high school students staked forty claims and later sold them for \$15,000. By the mid-1950s, almost six hundred producers on the Colorado Plateau were shipping uranium ore. Employment in the industry topped 8,000 workers in the mines and mills. Another bonanza in penny uranium stock established Salt Lake City as The Wall Street of Uranium. The AEC had turned the tap and caused a flood.”*, Ringholz, 2009. By 1960 Utah was producing in excess of 6.5 million pounds of uranium; however, in 1964 the AEC decided to stop purchasing uranium and the bust cycle was on (Ringholz, 2009). When I first explored the region in 1967 one could locate literally hundreds of abandoned, but staked, prospects. Much of the mined uranium came from the Jurassic Morrison Formation (~146---~156 MY; the famed dinosaur unit). The Morrison has a “look like” formation, the overlying Cretaceous Cedar Mountain Formation (~97---~125 Ma) and many uranium claims were established on this non-producing unit! It appears that not all of the prospectors had access to Geiger Counters. In fact, during my recent trips to the area I was still able to observe some of the old Cedar Mountain claims.

At any rate, since the 1960’s uranium production in the Colorado Plateau has waxed and waned several times. With the renewed interest in uranium-nourished power plants, the area has seen a resurgence of new claims.

Today, the economy of Moab is mostly fueled by tourists. It is the closest city to Arches National Park, Canyonlands National Park, and the La Sal Mountains. It is a mecca for bicycle riding and racing, kayaking and rafting the Green River, rock climbing, and riding off-road vehicles. It is a wonderful place to observe some really fantastic geology and to do some great rockhounding.

The rockhounding guides record a number of collecting localities near Moab but I usually find guidebook listings as a hit or miss proposition and prefer to just explore the countryside. One of the “major” side roads” leading out of Moab is UT 279, the potash road, heading southwest

to the mine and processing plant but little else except open land. The road follows along the north side of Colorado River and is a beautiful drive. After about 10 miles there are a number of pull offs with great views of the river (Fig. 8). These areas have a thin veneer of gravel and rockhounds should be able to gather a nice supply of chalcedony and flint/chert. Most of the specimens are of a gray color but they do make great tumbling material. I found a couple of poorly banded agates but nothing spectacular or colorful.

South of the River is a road known as the Kane Creek Road leading out from the town to Kane Springs and the Lockhart Basin. I

suggest a high clearance vehicle for the road passes over Hurrah Pass. After about 12 miles the countryside opens up and prospectors may search the areas along the road for nice, translucent pieces of chalcedony and some banded material called agate; however, the latter material is more of an opaque flint/chert with inclusions. I also found concentrations of chalcedony chips that obviously represented an area of flint knapping by Early Americans. These were left undisturbed as Federal Regulations protect such assemblages.

Klondike Bluffs is an area well known to rockhounds since the ground is littered with white, red, and orange chalcedony along with petrified wood fragments. The Bluffs are located north of Moab about 15 miles on UT 191 to Ten Mile Road just south of the Canyonlands Airport. Turn west for about 2.75 miles then take the right fork (at the jct. with Old Dead Horse Point Road) for about 1.75 miles. If you continue on this road for another couple of miles to the intersection with Ruby Ranch Road petrified wood is available. Another four miles will bring you to Floy Jct. at I-70. Returning along Ten Mile Road turning south at Old Dead Horse Point Road (the first jct.) will lead you to Dubinky Well and the massive agate, flint, quartz, and jasper fields. Prospectors could easily pick up a bucket of specimens in 15 minutes; however, one needs to look a little harder for the reddish agates prized by collectors.

Finally, virtually everywhere the Chinle Formation (late Triassic) crops out near Moab (and all over the Colorado Plateau) collectors have a good chance of finding petrified wood. Most of the wood near Moab is not a really “good wood” for polishing large slabs. Some seems OK for tumbling while other pieces show great structure and make nice shelf specimens.



Fig. 8. Vehicle pull-offs along the Colorado River “potash road” allow for easy collecting of microcrystalline quartz.

I have collected at a dozen other places near Moab and have always found decent specimens of the microcrystalline quartz minerals. The rocks are well exposed and a great number of the formations, especially Jurassic and Triassic, contain collectable minerals and petrified wood. And, the scenery is spectacular.

Northeast of Moab is the San Rafael Swell (Fig 1), a beautiful area near Price, Utah, (central Utah) where uplifted and tilted Mesozoic rocks surround a central core of late Paleozoic rocks (I-70 passes through the center west of Green River). The Swell is actually a Laramide anticlinal uplift but without Precambrian rocks reaching the surface in the center (as in the Uinta

Mountains and the Front Range). I spent several summers in the Swell at a quarry extracting and screening the rocks for fossil mammals (Fig. 9). While prospecting for fossils I was always in search for brightly colored and polished specimens of quartz, chalcedony, chert, jasper, and agate located in the Cretaceous Cedar Mountain Formation, ~125



Fig. 9. Mudstones and claystones of the Cedar Mountain Formation easily erode to form "badlands". The sandstone in the foreground, and capping the slope across the gully, is the overlying Dakota Formation. The Rough Road Quarry, from a small knoll in the mudstone, has produced early mammals (some new to science), lizards, dinosaurs, dinosaur egg shells, snails, crocodilians, rays, turtles, sharks, and fish.

Ma—97 Ma (Kirkland and Madsen, 2007). These interesting clasts are highly polished, almost as from a tumbler, and are quite conspicuous in the gray clays and mudstones of the Formation (Fig. 10). Some geologists have called these stones gastroliths or gizzard stones and have attributed their origin to polishing within the intestinal tracts of dinosaurs. However, the evidence is less than conclusive for the many stones present in the Cedar Mountain (and some other formations) and the "origin debate" is ongoing. In addition, geologists remain uncertain as to the ultimate provenance of the polished stones. At least some of the chert clasts contain marine fossils reworked from rocks in Arizona and Nevada (Kirkland and Madsen, 2007).

To locate prospecting areas for microcrystalline quartz take any of the gravel roads heading east from near the communities of Huntington or Castle Dale but particularly the Buckhorn Draw road immediately north of Castle Dale (the San Rafael Recreation area road). The road at first (for several miles) traverses the gray and brown Mancos Shale (don't drive in the rain) then cuts through the brown and resistant sandstone of the Dakota Formation and then into the gray mudstones and

shales of the Cedar Mountain. Park your vehicle and begin to prospect the outcrops-- you can't miss the polished pebbles.

And, speaking of scenery, I have sort of stayed away from commenting about the spectacular geology displayed in the parks and monuments of the Colorado Plateaus as voluminous books have been written about each. Any number of these volumes is available at booksellers but I would suggest one in particular: Utah Geological Association #28 *Geology of Utah's Parks and Monuments*, edited by D. A. Sprinkel, T. C. Chidsey, Jr. and P. B. Anderson, 2000. Also check out *The U.S. Civil War and Utah Landscape*, May 13, 2012; *Strange Markings in the Moenkopi Formation*, April 17, 2012; *Travertine at Utah Geysers*, April 15, 2012 at www.csmsgeologypost.blogspot.com.

In closing for this month, I have always enjoyed the stories about Charlie Steen and the uranium rush, some



Fig. 10. Highly polished pebbles of various forms of microcrystalline quartz are common in the Cedar Mountain Formation.

of which were related to me by people who were there: "It was \$100 million before it was over with, and that was a lot of money in those days. We enjoyed spendin' it, because that's what money is made for."

REFERENCES CITED:

- Hampson, A. G., 1993, Minerals of the Big Indian Copper Mine San Juan County, Utah: Rocks and Minerals, v. 68, No. 6.
- Kirkland, J. I. and S. K. Madsen, 2007, The Lower Cretaceous Cedar Mountain Formation, Eastern Utah: The View Up, An Always Interesting Learning Curve: Geological Society of America Rocky Mountain Section Annual Meeting Guidebook, Denver.
- Mutschler, F. E., E.E. Larson, and M. L. Ross, 1997, Potential for Alkaline Igneous Rock-Related Gold Deposits in the Colorado Plateau Laccolithic Centers in Friedman, J. D. and A. C. Huffman (Coordinators), Laccolith Complexes of Southeastern Utah: Time of Emplacement and Tectonic Setting—Workshop Proceedings: U. S. Geological Survey Bulletin 2158.
- Ringholz, R. C., 2009, Utah's Uranium Boom in Beehive 16, Utah History to Go: <http://historytogo.utah.gov/>
- SRK Consulting, 2006, Constellation Copper Corporation: Resource Estimate Centennial Deposit: private report.
- Sullivan, K. R. 1997, Isotopic Ages of Igneous Intrusions in Southeastern Utah in Friedman, J. D. and A. C. Huffman (Coordinators), Laccolith Complexes of Southeastern Utah: Time of Emplacement and Tectonic Setting—Workshop Proceedings: U. S. Geological Survey Bulletin 2158.

Source: *Rocky Mountain Federation News*, Apr 2013

Canyonlands National Park: Upheaval Dome

NASA Upheaval Dome is a striking geologic structure in the Canyonlands National Park of southern Utah. Viewed from directly above (and on geologic maps), the alternating rock layers make a nearly circular, 5.5-kilometer- (3.4-mile-) diameter “bull’s-eye.” The oldest rocks are in the center (Chinle and Moenkopi Formations, with limited exposures of even older rocks), and progressively younger rocks are exposed farther out: Wingate Sandstone, Kayenta Formation, and Navajo Sandstone (in order of decreasing age).



This kind of rock formation—a fold in the Earth’s crust in which the rocks slope downward from either side of a central point—is called an **anticline**. If the exposed rock layers form a closed circle at the surface, the anticline is called a **dome**. It is typical of these formations for the central rocks to be the oldest.

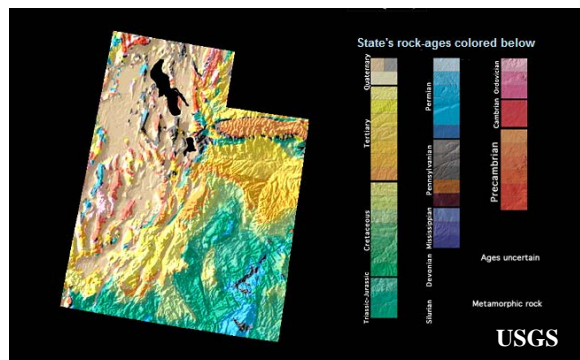
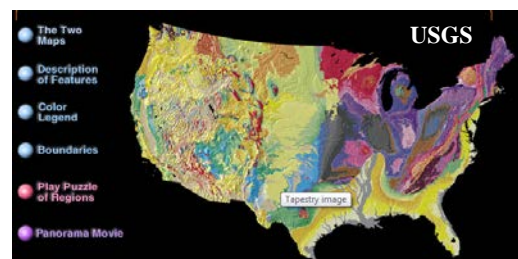
Scientists propose at least two ideas about how Upheaval Dome formed. Some believe that the dome is a sign of a sub-surface **salt dome**—a rising plug of relatively low-density salt that caused overlying rock layers to dome up in a circular pattern like a basketball underneath a blanket. The overlying rock layers were uplifted and then eroded, leaving the bull’s-eye surface pattern.

Another hypothesis identifies Upheaval Dome as an impact structure, caused by a meteor striking the Earth approximately 60 million years ago. In this interpretation, the erosion-resistant Navajo and Wingate Sandstones define multiple crater rings, while the Chinle, Moenkopi, and older rocks exposed in the middle of the dome are the central peak of the impact structure. Debate about the origin of Upheaval Dome continues; recent evidence—such as microscale deformations of the rocks and minerals that are consistent with a high-energy impact event—lends support to the impact-structure hypothesis.

Additional images taken by astronauts and cosmonauts can be viewed at the NASA/JSC [Gateway to Astronaut Photography of Earth](http://eol.jsc.nasa.gov). (<http://eol.jsc.nasa.gov>)

A Tapestry of Time and Terrain — The Union of Two Maps: Geology and Topography

USGS Through computer processing and enhancement, the U.S. Geological Survey (USGS) has merged two existing images of the Nation’s lower 48 states into a single digital tapestry. Woven into the fabric of this new map are data from previous USGS maps that depict the topography and geology of the



United States. The resulting composite is the most detailed and accurate portrait of the U.S. land surface and the ages of its underlying rock formations yet displayed in the same image. The new map resembles traditional 3-D perspective drawings of landscapes with the addition of a fourth dimension, geologic time, which is shown in color.

Main Website: <http://tapestry.usgs.gov/Default.html>,

Utah Map: <http://tapestry.usgs.gov/states/utah.html>

The map is interactive allowing you to displaying specific time periods.

This website is very, very cool! Check it out!

Officers & Club Information

2013 Board of Directors

Officers

President	Dan Siler	801-737-3013
Vice President	Steve Smith	801-731-4216
Secretary	Dave Offret	801-791-6081
Treasurer	David Law	801-731-4255

Activity Committee and Chairpersons

Field Trip Leader	Joe Kent	801-771-8184
Program	Ray Rutledge	801-732-8331
Door Prize	Jim Alexander	801-399-0785
Hospitality	Linda Pilcher	801-392-7620
Communications	Kay Berry	801-825-6261
Membership	David Law	801-644-4931
Mini-show	Alice Crittenden	801-547-7781
Safety	Lynn Hayes	435-723-2216
Publicity	Mark Acker	801-475-4705
Buzzer Editor	Dave Harris	801-737-1266
Associate	Leora Alexander	801-399-0785
Photographer	Shari Bush	801-388-8605
Calling Committee	Sherm & Ricky Thompson	435-760-1362

Federation Representatives

Rocky Mountain Federation Delegate	Joe Kent
Utah Federation Delegate	Open
Public Land Advisory Committee	Jim Alexander

Club Affiliations

The Beehive Rock & Gem Club began in April of 1970 and is a member of the following:

Utah Federation of Mineralogical Societies
 Rocky Mountain Federation of Mineralogical Societies
 American Federation of Mineralogical Societies
 Scribe

Advertising Rates:

For sale ads are permitted for members at no charge. Business advertisements will be charged at the rate of \$5.00 for 1/4 page or 15 cents per word for less than 1/4 page.

General Objectives of the Club

The purpose of our club is to stimulate interest in the collection of rocks, minerals, gem materials, and legal fossils. To discuss and impart our knowledge of the different phases of collecting, cutting, polishing and displaying them. Also to organize educational meetings, field trips and similar events while enjoying and protecting our natural resources.

Membership Dues

Yearly membership dues are for adult members are

Single	\$11
Couple or Family	\$16
Junior (Under 18 not part of family membership)	\$5

Dues are due October 1 of each year.

Meetings

General club meetings are held at 7 pm on the fourth Thursday of each month in the multi-purpose room of the City of Roy Municipal Center located at 5051 South 1900 West, Roy, Utah.

All visitors are welcome!

Board Meetings are held at 7 pm on the first Thursday of each month at the Roy Library located at 1950 West 4800 South, Roy, Utah.

Newsletter

The Beehive Buzzer is the official newsletter of Ogden Beehive Rock and Gem Club and is published eleven times per year. Please send submissions and exchange bulletins to beehivebuzzer@gmail.com.

Any material in this bulletin may be copied, unless marked as copyrighted, as long as credit is given.

