



## Wickenburg Gem & Mineral Society, Inc.

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*The purpose of this organization shall be to educate and to provide fellowship for people interested in rocks and minerals; to foster love and appreciation of minerals, rocks, gems, and the Earth. Membership shall be open to all interested people.*

### Desert Geology....and more

During the month of January there were four field trips offered: Brenda for jasper, Reserve Bank Mine for chrysocolla and associated copper minerals, Stanton for gold panning/detecting, and Aguila Road for mushroom rhyolite.

These trips, as will be many future ones, were in desert locations, and besides the material for which the trips are specifically planned, there are lots of interesting desert features that we can appreciate, as we walk about with our eyes on the ground.

**Desert Varnish** Desert varnish (Figure 1 below) is a red to black coating that forms on stable rocks (of many types) in arid climates. Bacteria and fungi, on rock surfaces, provide a substrate to which windblown clay dust will adhere. Additionally, manganese and iron minerals are either blown in as dust particles, or provided by surface runoff (both are soluble, so in humid climates will leach out of the surface; but in desert climates they tend to stick around). Either by action of microbes, or oxidation occurring on the clays, the iron and manganese are concentrated and fixed to the rock surfaces, as that shiny red to black coating (the black coatings are shiniest). In fact, the concentration of manganese in black coatings is 50 times higher than that of the surrounding soils. This process is a prolonged one — taking hundreds to thousands of years — producing a coating of 1-40 micrometers (a human hair is about 90 micrometers wide) in 1000 years.

Desert varnish makes petroglyphs and pictographs possible, as ancient residents of the Southwest chipped off the dark coating to create images by revealing the lighter-colored rock beneath. They have also been used by geologists and archaeologists to document periods of climatic variations, and to estimate the age of desert surfaces.

*Continued on page 3....*



**FIGURE 1 Desert Varnish**

These photos are from the Brenda trip. In the Image A, you see various rocks with very dark surfaces. The rock, in the center, has been chipped, revealing the lighter-colored rock beneath the thin black coating. The rock in Image B illustrates the shiny surface, as it catches the sunlight. *Photo by Susan Celestian*



Scenery near Brenda, Arizona

**Dues  
are  
Due**

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**Meeting Minutes — January , 2014**

The meeting was called to order at 7 pm by Craig Jones. There were seven guests.

Debbie announced that Lucille Burroughs had passed away. Memorial services are pending. A motion was made and seconded to order flowers. Debbie will take care of it.

The December minutes were read and approved. Debbie went over the 2014 planned budget and expenses and the planned budget for 2015. Both were approved as read.

Old Business: Craig announced that the planned volunteer dinner will not happen. Since we are a tax exempt 501C organization, we cannot “pay” our volunteers, which a catered dinner would be. Future expenses of this type will be paid out of a “members fund”.

Karen Coulter gave a report on their Stanton charity raffle event which took place in cold snowy weather.

It was suggested that the membership application be updated to include information about the Gem and Mineral Society, and that Windows Publisher could be used to do so. Everyone asked to come up with examples.

Craig announced that Jason Munger has volunteered to help Beth with the advertising, etc. for the future Gem and Mineral shows.

*continued to right.....*

*.....Minutes continued*

Steve Hill reported and was given \$40 to get the 2015 Scholarship Fund started.

Rock Trips: Saturday January 17 -- Meet at Alco parking lot in Wickenburg at 9 am to go to the Brenda area for jasper, agate, and desert roses.

Gary Huetson and Joyce Ramage will take us to their copper mine on January 24. Meet at Vulture Peak trail head on Vulture Mine road at 9 am.

The mushroom rhyolite trip will be January 31. Information to follow.

February is pretty much open -- February 21: Cave Creek jasper, agate, and onyx. March 7: rock polishing at the Gem Shop in Morristown.

The Stanton group will host a tour of the gold claim on Wednesday January 28. They will furnish hot dogs and hamburgers. Everyone is to bring a pot luck dish. Meet at the flagpole at the Mobile gas station on 93 and Vulture Mine road at 9 am.

Steve Hill took the prize for Show and Tell. Janet Bell, Gary Huetson, and Jeanette Bartlett were door prize winners.

The meeting adjourned at 8:10 pm.

Respectfully submitted,  
Sue Jones, Secretary



Panning and sluicing on the club claim during the field trip and potluck on January 28th.



.....Desert Geology continued from page 1

**Desert Pavement** Desert pavement (Figure 2) is a protective armor of interlocking pebbles and cobbles, that covers the desert floor. This surface has largely been considered a lag deposit — rocks left behind as wind and water winnow away the small sand, silt and dust. An additional factor that has been favored is also heaving. With heaving, clays that swell when wet, push rocks toward the surface, and smaller particles fall under the rocks to fill in the gap (and thus keep the rock at the higher elevation). Over time, the rocks are lifted to the surface. (This process may also occur as salt crystals form in a soil. Expansion with crystallization can lift soil particles.) More recently, it has been proposed, that in addition to heave, dust particles somehow are deposited under the rocks, thus building up a rockless soil below the desert pavement.



**FIGURE 2 Desert Pavement** In the photo above, from the Brenda area, you see a surface covered with interlocking rocks. Below, is the same surface disturbed, to show the fine material that exists below the rocky surface. *Photos by Susan Celestian*



**Boulder Cleaving** Many rocks in desert pavement are cracked (Figure 3). This is thought to be primarily precipitated by thermal expansion and contraction, due to solar heating and subsequent cooling (cooling especially during the morning hours). Other processes that may contribute to the development and expansion of cracks are salt crystal growth, clay expansion, and gravity.



**FIGURE 3 Boulder Cleavage** A boulder that has cracked due to thermal expansion and contraction on the desert floor near Brenda, Arizona. *Photo by Susan Celestian*

**Caliche** Caliche is a deposit of calcium carbonate, that acts as a cement between rocks and other soil particles (Figure 4). It occurs at or near the surface of desert soils — in areas where this soluble material is not washed out. It can be recognized as a usually very light-colored material, in which you may be able to see thin layers; and of course it will fizz in acid.



**FIGURE 4 Caliche** Caliche binding cobbles together on the desert floor near Brenda, Arizona. *Photo by Susan Celestian*

Continued on page 4...



.....*Desert Geology continued from page 3*

**Ventifacts** Ventifacts are rocks that are faceted by the abrasion of sand, blasted by wind (Figure 5). We haven't seen any on recent club field trips, but we may — or you may encounter them on your personal forays into the desert. Rocks may exhibit 1 or more flat faces, reflecting the wind direction(s) impacting them. Additionally, rocks may be fluted or otherwise sculpted by prolonged sandblasting.



**FIGURE 5 Ventifact** This is a photo of a ventifact in Death Valley. Note that there are at least 3 major facets, and 3 minor ones — reflecting prevailing and changing wind directions. The rock is faceted, smoothed, and polished. *Photo by Stan Celestian*

**Mistletoe** *Phoradendron californicum* (Figure 6) or desert mistletoe can be seen as a leafless clump growing on palo verde and mesquite trees, in the Mohave and Sonoran deserts. It is hemiparasitic, as it takes water and minerals from the host tree, but performs its own photosynthesis. The plant contains toxins that when ingested can cause high blood pressure, slowed heart rate, convulsions, and cardiac arrest.

**FIGURE 6 Desert Mistletoe**

The dark green clump in this palo verde tree is the hemiparasite, *Phoradendron californicum*. *Photo by Susan Celestian*



**Nurse Tree** Throughout the desert you may see saguaros growing under the protective boughs of a palo verde, ironwood, or mesquite tree. This is a nurse tree (Figure 7), and it does provide protection from sun, frost, and possibly some wildlife. This relationship is good for the saguaro, but may prove fatal for the tree, as the cactus competes for water and nourishment.



**FIGURE 7 Nurse Tree** Three young saguaros huddle under the protective branches of a palo verde tree, near Brenda, Arizona. *Photo by Susan Celestian*

#### References:

Wikipedia  
 Geology.com  
 National park service  
 Artsandsciences.colorado.edu



## January 14th Club Field Trip to the Reserve Bank Mine

Two club members own and operate Arizona's smallest full production mine — a copper mine, not far from Vulture Peak. Gary Hueston and Joyce Ramage have been rehabilitating the working the mine since 1999. The original mine was opened in 1899, and was called the Angel Mine.

Gary and Joyce's operation is really amazing. They have ladders going down about 75 feet, in 10-foot segments. The ore is brought to the surface in an ore bucket. Joyce hand-sorts out the chalcocite-rich ore, which is crushed to about the size of a quarter. Ore is placed in a crucible, and fired in a small furnace to about 2200 degrees F. Once the copper has been released from the rock, it is poured off. Then it is re-fired and poured into rod or bar molds. The bars are stamped with the mine name and sold online. Joyce draws the rod out into wire, which she uses to create beautiful jewelry. You can buy some 100% Arizona copper jewelry or bars by going to <http://huetramining.wix.com/reserve-bank-mine> Below are some pictures from the adventure — Thanks Gary and Joyce! *Photos by Sue & Stan Celestian*



Joyce Ramage tells the group a bit about the history of their mine.



Headframe of the Reserve Bank Mine.



Ore bucket at the Reserve Bank Mine



Chalcocite (dark mineral) surrounded by chrysocolla. Both are copper minerals, but chalcocite (copper oxide) can be successfully smelted for free copper.



Crushed high-grade ore, Reserve Bank Mine

**CHALCOCITE**  
Copper Sulfide  
**Cu<sub>2</sub>S**

Continued on page 6.....

The smelter at the Reserve Bank Mine. Crucibles full of ore go into the furnace (rusty object). The melted copper is poured into the bar mold (seen atop the furnace).





.....Reserve Bank Mine continued from page 6



Four fit and brave men await their descent into the depths of the Reserve Bank Mine.



Stan Celestian waves bye-bye



Jayson Stephens gazes upon slickensides.



Adit within the Reserve Bank Mine



Gary Hueston emerges from the mine, after leading an informative tour.



Beautiful necklace of bent AZ copper wire, made by Joyce Ramage



Mel Canter (above) and Dave Perkad (left) search through the dump for workable rock.





### January 28th Club Field Trip for Mushroom Rhyolite



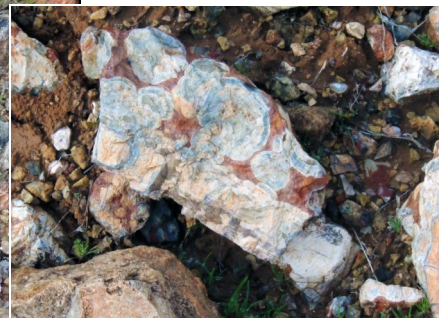
It had rained for two days, but the weather held off long enough for a few club members and some winter guests from Idaho to make the trek along a sloppy Aguila Road to a mushroom rhyolite claim. This area is being claimed by the Quartzsite club, and will be made available to members of the Wickenburg club. It looks like the material will take a great polish, and the swirly patterns are very interesting. The area is all gray rhyolite, with areas of murky black obsidian. Much of the rhyolite has abundant lithophysae (*lith o fi see*). These “stone bubbles” are not well understood, but are thought to be associated with gas cavities, and the deposition of tiny crystals of various minerals in concentric layers. Some of the lithophysae weather out and lay about like marbles on the ground. There are some cavities lined with quartz crystals, too! In any case, they do add interest to the rock, making it a good lapidary material.



Whееееее!!!!!!



Obsidian





## UPCOMING AZ MINERAL SHOWS

### **January 1- February 28, 2015 - Quartzsite, AZ**

Desert Gardens Gem and Mineral Show; Desert Gardens Show Grounds, 1055 Kuehn Rd; 8-5 daily; after February 10, vendors are transitional, Free admission, free parking; the largest gem and mineral show in Quartzsite.

### **February - Tucson, AZ mineral/fossil shows**

<http://www.xpopress.com/AZ-show-schedule.html>

### **February 12-15 - Tucson, Gem & Mineral Show**

Main show at Tucson Convention Center; 260 S Church St; Th-Sat 10-6, Sun 10-5; Admission \$10, 14 & under free; vendors from around the world; speakers, seminars. Web site: <http://www.tgms.org/show-2015/>

### **February 21-22 - Apache Junction, AZ**

Apache Gem & Mineral Club; Skyline HS; 845 S Crimson Rd; Sat 9-6, Sun 10-4; Admission \$3, students \$1, children free. Web site: [ajrockclub.com](http://ajrockclub.com)

### **March 12-15, 2015 - Deming, NM**

50th Annual Rockhound Roundup; Deming Gem & Mineral Society; Southwest New Mexico Fairground; 9-5 daily; Free admission, free parking. Field trips Thurs-Sat. Flyer: <http://www.thedgms.com/wp-content/uploads/2014/09/2015-Flyer.pdf>

### **March 27-29 - Phoenix, AZ**

Minerals of Arizona Symposium; Clarion Hotel at the Phoenix Tech Center; northwest corner of Elliot Rd & I-10. Symposium registration fee; but the Mineral Sale is FREE — there will be dealers in several of the hotel rooms: Friday 5-10, Sat 4:30-6 and after dinner.

### **April 12-13 - Anthem, AZ**

Daisy Mountain Rock & Mineral Club; Anthem School; 41020 N Freedom Way; Sat 10-5, Sun 10-4; Admission \$3, seniors & students \$2, children free; parking free.

If you are travelling, a good source for out-of-state (or in-state) gem and mineral shows AND clubs is

<http://www.the-vug.com/vug/vugshows.html> or  
<http://www.rockngem.com/ShowDatesFiles/ShowDatesDisplayAll.php?ShowState=AZ>

For out-of-the-country shows:

<http://www.mindat.org/eventlist.php>

A good source for a list of Arizona Mineral Clubs and contact information is

[http://whitemountain-azrockclub.org/Public\\_AZ\\_Clubs\\_Links.html](http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html)

## UPCOMING WGMS FIELD TRIPS

### **February 10, 2015 ANDERSON MINE**

Agate, Weeksite, possible fossil wood

### **February 21, 2015 CAVE CREEK/SEVEN SPRINGS**

Agate, Jasper, Travertine

### **March 7, 2015 ROCK POLISHING DEMO**

by Jim Jacobs; Gem Shop in Morristown

*DATES SUBJECT TO CHANGE*

**If you all have some place that you would like to go. Let Bob Bartlett 623-388-0749, Marty Hagan 602-469-7770, Craig Jones 208-681-4770. We have some dates to fill in.**

**This is your club lets go out and have some fun.**

**Check the website for field trip announcements, especially if you don't have email!**

## Officers and Chairpersons

<b>President:</b>	Craig Jones	208-523-9355
<b>Vice President:</b>	Martin Hagan	602-469-7770
<b>Secretary:</b>	Sue Jones	208-523-9355
<b>Treasurer:</b>	Debra Keiser	928-684-1013
<b>Program Director:</b>	Dale Keiser	928-684-1013
<b>Publicity:</b>	currently open position	
<b>Membership:</b>	Roma Hagan	602-469-7662
<b>Editor:</b>	Susan Celestian	602-361-0739
<b>Field Trip:</b>	Craig Jones, Bob Bartlett, Marty Hagan	480-540-2318
<b>Show Chair:</b>	Beth Myerson	480-540-2318
<b>Scholarship Chair:</b>	Steve Hill	928-533-3825
<b>Historian:</b>	Jeanine Brown	928-684-0489

Meetings are held the **2nd Friday** most months at **Coffinger Park banquet room**. Potluck dessert at 6:30 pm. Business meeting at 7:00 pm. **Exceptions: February and December** meetings are held on the **first Friday of the month**. We don't meet in the summer — **no meetings in June, July or August**.

**Membership Dues:** \$15.00 Adults per Person  
\$ 5.00 Juniors and Students

### Meeting Dates for 2014/15

**Wickenburg:** Jan 9, Feb 6, Mar 13, Apr 10, May 8, Sept 11, Oct 9, Nov 13, Dec 4

**Stanton meets** 1st and 3rd Tuesday, Field Trips are 2nd & 4th Tuesday of the month.



# MINERALS IN OUR EVERYDAY LIVES

## FACT SHEET

## CELL PHONE

### What's in my Cell Phone?



- ◆ **Arsenic (gallium arsenide in the ampli®er and receiver).** Mined in China, Chile, Morocco, Peru, Kazakhstan, Russia, Belgium and Mexico.
- ◆ **Copper (circuitry).** Mined in Chile, United States, Peru, China, Australia, Russia, Indonesia, Canada, Zambia, Poland, Kazakhstan and Mexico.
- ◆ **Gallium (gallium arsenide).** Mined in China, Germany, Kazakhstan and Ukraine.
- ◆ **Gold (circuitry).** Mined in China, United States, Australia, South Africa, Peru, Russia, Canada, Uzbekistan, Ghana, Papua New Guinea, Indonesia, Brazil, Mexico and Chile.
- ◆ **Magnesium compounds (phone case).** Mined in China, Turkey, North Korea, Russia, Slovakia, Austria, Spain, Australia, Brazil, Greece, India and the United States.
- ◆ **Palladium (circuitry).** Mined in Russia, South Africa, Canada, United States and Zimbabwe.
- ◆ **Platinum (circuitry).** Mined in South Africa, Russia, Canada, Zimbabwe, United States and Colombia.
- ◆ **Silver (circuitry).** Mined in Peru, Mexico, China, Australia, Chile, Russia, United States, Poland, Bolivia and Canada.
- ◆ **Tungsten (circuitry).** Mined in China, Russia, Canada, Austria, Bolivia and Portugal.
- ◆ A multitude of **petroleum products** are used in cellular phones.

### INTERESTING FACTS

- ◆ About 130 million cell phones are retired annually in the United States. Collectively, these cell phones weigh about 14,000 metric tons. Annually retired cell phones contain almost 2,100 metric tons of copper, 46 metric tons of silver, 3.9 metric tons of gold, 2 metric tons of palladium, and 0.04 metric tons of platinum.
- ◆ Recovery and recycling of cell phones are in the early stages of development, as is the case for recycling of electronics in general. For cell phone recycling to grow, recycling must become economically viable. Efficient recovery infrastructure, product designs that simplify dismantling, and other changes are needed to facilitate the growth of cell phone recycling.
- ◆ Gallium arsenide is used in the amplifier and receiver.
- ◆ Magnesium compounds are alloyed to make the cell phone cases.



To learn more about minerals and mining visit  
[www.MineralsEducationCoalition.org](http://www.MineralsEducationCoalition.org)  
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 303-948-4200 \* 800-763-3132

