



## Wickenburg Gem & Mineral Society, Inc.

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[www.wickenburggms.org](http://www.wickenburggms.org)

*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.*

## COARSE-GRAINED CLASTIC SEDIMENTARY ROCKS — Breccia and Conglomerate

Breccia and Conglomerate are both coarse-grained clastic rocks. They share a lot of textural characteristics, but do have somewhat different environment-of-deposition implications. See Figure 1.

CLASTIC SEDIMENTARY ROCKS		
Coarse-grained (pebbles, cobbles, boulders)	Medium-grained (sand)	Fine-grained (silt, clay)
<b>BRECCIA</b> - large, angular fragments, with fine matrix	<b>QUARTZ SANDSTONE</b> - mostly quartz sand; looks sandy; may shed loose grains of sand	<b>SHALE</b> - composed of clays, which lead to fine layers; dull luster; soft
<b>CONGLOMERATE</b> - large, rounded fragments, with fine matrix	<b>ARKOSE</b> - assorted sizes, with visible feldspar; often reddish	<b>SILTSTONE</b> - composed of fine particles of quartz and feldspar; massive; gritty feel
	<b>GRAYWACKE</b> - assorted sizes, with mica and rock fragments; dark gray or greenish-gray	

FIGURE 1. Clastic Sedimentary Rock Chart

Sedimentary **BRECCIA** (pronounced brechia) is a very poorly-sorted, immature rock. It is composed of predominately large angular rock, randomly-oriented fragments (> 2 mm), within a matrix of fine-grained particles (sand to clay) or cement (such as calcite or quartz). These characteristics indicate that the rock has undergone very little transportation, and has been deposited quickly and close to its source.

### Breccia Environments of Deposition:

Sedimentary environments in which breccia is deposited include talus slopes, alluvial fans, landslides, debris flows, some glacial deposits, and along fault planes, See Figures 2-6 for photos of “future breccia” sediments in their environments of deposition. See Figures 7-10 for breccia rocks.

The program on March 11 will be presented by Stan Celestian — “The Amazing Tucson & Mineral Show”

Come and be amazed!



FIGURE 2. Talus Slope near Omak, Washington Large, angular blocks of basalt have tumbled a short distance down a steep slope, forming a cone of debris.  
*Photo by Susan Celestian*

Coarse-grained continued on page 3.....

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### Meeting Minutes — February 5, 2016

The meeting was called to order by Marty Hagan at 7 PM. The pledge of allegiance was recited and a short prayer was offered. The minutes from the January 2016 meeting were read by Judy Zimmerlee, and was approved and accepted after name changes were made. The treasury report was given by Debbie Keiser and approved and accepted.

Old business discussed. Jason Munger will purchase an American flag to have at meetings. Having a first aid kit available through the group was discussed. A suggestion was given for each vehicle to carry its own kit. No final decision was made.

New business discussed. The November Gem and Mineral Show was discussed, including having members begin to sign up for helping, to have members begin collecting rocks and other items for the silent auction, and that there will be a kids table this year. Purchasing another gold nugget for raffle this year was discussed. Karen Coulter will look into getting it. There is a need for a publicity chair.

Trip coordinator position was discussed. It was decided that the member that is planning each trip will be the coordinator for their trip. It has been found that the mushroom rhyolite claim is no longer owned by the Quartzite group, it has no claim on it at the current time.

Fields trips were planned. Wednesday, February 10, 2016, the Stanton group will meet at the ALCO parking lot at 11:00 AM for Mushroom rhyolite, then

Continued.....

<http://www.wickenburggms.org/>

If you ever have photos from a club field trip, send a couple to Dale, for posting on the website.

later for a picnic potluck and grilled hotdogs to see the fluorescent rocks. On Wednesday, February 17, 2016, Rick Jones will lead a trip to Eagle Eye for fluorite, and will meet at the ALCO parking lot at 10:00 AM. On Friday, March 4, 2016, at 10:00 AM, Al and Erma Roe will have members at their home in Congress for members to look over their rocks, get questions answered, and have jewelry available for purchase.

Show and tell was done by six members. Terry Warren won the prize.

Door prizes were won by Nadine Schlaepfi, Tom MacWilliams, Terry Warren, Deb MacWilliams, and Karen Coulter.

The meeting was adjourned at 7:55 PM.

Respectfully submitted,  
Judy Zimmerlee



Fluorite in the classic blue, characteristic of the Blanchard Mine, Bingham, Socorro County, New Mexico  
*Photo by Stan Celestian*

### NOTES FROM THE EDITOR

Have a geological interest? Been somewhere interesting? Have pictures from a club trip? Collected some great material? Write a short story (pictures would be great). I'd like topic suggestions also.

Deadline for the newsletter is the end of the month.

Mail or Email submissions to:  
Susan Celestian, editor  
6415 N 183rd Av  
Waddell, AZ 85355  
azrocklady@gmail.com



.....Coarse-grained continued from page 1

More future breccias:



**FIGURE 3 Hope Landslide, British Columbia** This landslide occurred at 7am on January 9, 1965. An estimated 47 cubic meters of mud and huge, angular rocks quickly roared down the mountainside and up the other side of the valley. This photo was taken from the debris pile left across the valley from the failed slope — and 180 feet above the original land surface! *Photo by Susan Celestian*



**FIGURE 4. Alluvial Fan in Death Valley** Large fan-shaped piles of rock debris are common in arid environments. Braided streams snake across the porous material, quickly losing their momentum, and depositing their load, which ranges from angular to rounded, small to very large. *Photo by Stan Celestian*

**FIGURE 5 Glacial Terminal Moraines** When stationary glacial ice melts, a pile of angular, unsorted debris builds up at the ice front. Since the rock has been trapped in ice, there has been no opportunity for rounding by abrasion, and ice is capable of transporting extremely large blocks of rock. Both photos were taken in Teton National Park: 'A' is on Mt. Moran, 'B' is off Teton Glacier.

*Photos by Susan Celestian*



**FIGURE 6.** Close-up view of the angular, unsorted gravel and sand transported by glacial ice on Matanuska Glacier, in Alaska. *Photo by Susan Celestian*

**FIGURE 7. Fault Breccia,** from Nevada, cemented by calcite. *Photo by Stan Celestian*



Coarse-grained continued on page 4.....



.....Coarse-grained continued from page 3



*Photo by Stan Celestian*

**FIGURE 8. Breccia at Ray Mine, Arizona** This is likely a breccia formed by grinding along a fault plane. Invasion of copper-rich groundwater provided the quartz, chrysocolla, and malachite that cement the fragments together. *Photo by Stan Celestian*



**FIGURE 9. Mega-breccia in Titus Canyon, Death Valley, Nevada.** Probably as a result of faulting or folding, the dark gray Cambrian limestone has been broken up into huge blocks that have been cemented together by calcite. *Photo by Stan Celestian*



**FIGURE 10. Mosaic Canyon, Death Valley, Nevada** This thin breccia formed by a debris flow that issued through a narrow channel. Note that the upper brown breccia lies upon an older gray one. Debris flows are a common feature of arid climates, where rock debris accumulates, until an infrequent rainstorm and rapid overland runoff, scoops up the debris and transports it rapidly downhill, as a thick slurry. *Photo by Stan Celestian*

**CONGLOMERATE** is similar to breccia, except It is composed of predominately large rounded to sub-angular, randomly-oriented fragments (> 2 mm), within a matrix of fine-grained particles (sand to clay) or cement (such as calcite or quartz). These characteristics indicate that the rock has undergone transportation, but has been deposited fairly close to its source, and in a high-energy environment. A high-energy environment (one with strong currents or waves) is necessary to move the large rock particles.

Conglomerates can exhibit better sorting than breccias. Often size range is not as broad as that in breccias, and sometimes the large fragments are in roughly the same size range.

**Conglomerate Environments of Deposition:**

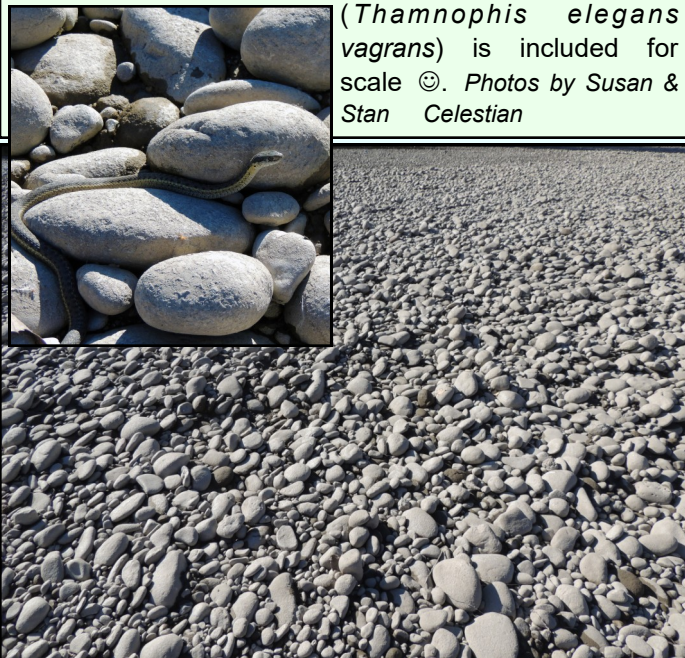
Sedimentary environments in which conglomerate is deposited include alluvial fans (*fanglomerates*), debris flows, some glacial water-laid deposits, nearshore shallow marine (such as beaches), streams, and sometimes deep marine turbidites (underwater landslide deposits), See Figures 10-14 for 'future conglomerates'. See Figures 15-17 for conglomerate rocks.

Coarse-grained continued on page 5.....

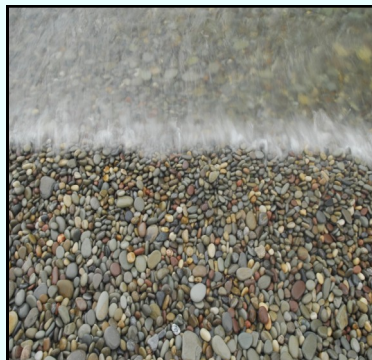


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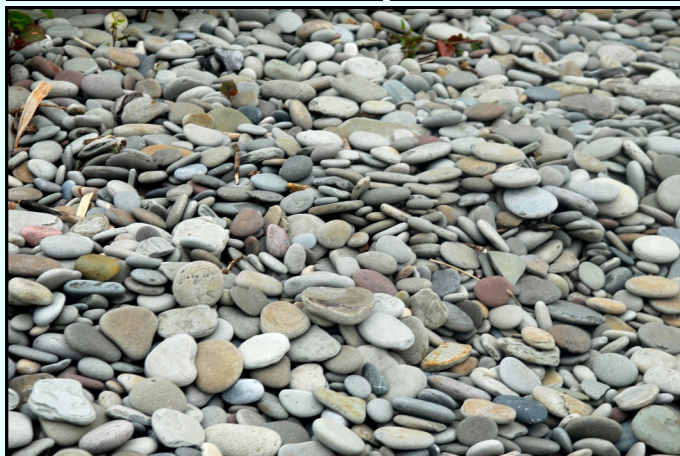
**FIGURE 11. Gravel of the Yellowstone River, Billings, Montana** This is a photo of the coarse, rounded gravels forming the bed of the Yellowstone River. Note that there is some orientation of the cobbles, resulting from moving water. Inset: The Garter Snake (*Thamnophis elegans vagrans*) is included for scale ☺. Photos by Susan & Stan Celestian



**FIGURE 12. Milky Creek Draining Emmons Glacier, Mt. Rainier National Park** Despite having been locked in ice for the trip down the mountain, once released and transported by meltwater, the cobbles quickly begin to round. Photo by Stan Celestian



**FIGURE 13. Beach Cobbles on Lake Ontario, Oswego, New York** Strong storm waves pounding the shore has effected rounding and imbrications of these cobbles. Photos by Stan Celestian



**FIGURE 14 Alluvial Fan/Stream Deposits in Titus Canyon, Death Valley National Park** Deposited fairly rapidly by flash floods, and carried not far from their source, these large, poorly-sorted sediments exhibit sub-rounding to good rounding. Note that the sediments show some stratification (layering) and size segregation (sorting), due to the influence of moving water and gravity. Photo by Stan Celestian

Coarse-grained continued on page 6.....



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**FIGURE 15. Conglomerate** This conglomerate is predominately composed of quartz pebbles, which indicates that there has been quite a bit of transportation, to remove unstable minerals. Yet the rock is not well sorted, with a fairly range of grain sizes (clay/sand to pebbles up to 1.25" long). This is probably a stream deposit. *Photo by Stan Celestian*



**FIGURE 16. Conglomerate** This is a stream cobble, composed of stream cobbles — a great example of a rock taking a second trip through the rock cycle. The largest cobble is about 3" across. Note how the clay/sand, that binds the larger fragments, wears away faster than do the cobbles, and thus eventually the cobbles will be released to proceed on their own. *Photo by Stan Celestian*



**FIGURE 17 Pudding Stone** This rock is similar to that in Figure 18, however it has undergone slight metamorphism, making it denser. The pebbles are very rounded, and there is a distance contrast between the pebbles and the finer material. Note that the size range of the pebbles is narrower than that in Figure 15. Seemingly the environment of deposition was energetic enough to selectively transport large particles. *Photo by Stan Celestian*



**FIGURE 18. Pumice Conglomerate** This is a very unusual rock. Bits of pumice were transported by a stream and deposited in an area remote from the volcano of origin — to near Wupatki National Monument. Calcite binds the pebbles together. *Photo by Stan Celestian*

**UPCOMING AZ MINERAL SHOWS**

**January 8 - February 28 - Quartzsite, AZ** Desert Gardens Rock, Gem and Mineral Show; Desert Gardens Show Grounds, Admission/Parking: free. <http://www.xpopress.com/quartzsite-shows-swapmeets-schedule.html>

**March 12-13 - Anthem, AZ** Daisy Mt. Club Show and Sale, Boulder Creek HS, 40404 N. Galvin Peak Parkway; Sat 9-5, Sun 9-4; Admission adults/seniors \$2, children free. **See \$1 off coupon below.** [www.dmrmc.com](http://www.dmrmc.com)

**2016 ANTHEM  
GEM &  
MINERAL  
SHOW**

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SUNDAY, MARCH 13TH 9AM-4PM**

**BOULDER CREEK HIGH SCHOOL  
40404 N. GAVILAN PEAK PKWY  
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DAISY MOUNTAIN ROCK AND MINERAL CLUB  
Find us on  WEBSITE [WWW.DMRMC.COM](http://WWW.DMRMC.COM)

**March 19-20 - Cottonwood, AZ** CKM Productions, LLC, Mingus Union High School; 1801 East Fir Street ; Sat. 10-5, Sun. 10-4; Admission \$3, Children under 12 free admission. <https://www.facebook.com/CKMProductionsLLC/>

**May 7-8 - Kingman, AZ** Mohave County Gemstoners Club, Kingman Academy of Learning; 3420 N Burbank; Sat. 9-5, Sun. 9-4; Admission: free. [www.gemstoners.org](http://www.gemstoners.org)

**May 21-22 - Show Low, AZ** White Mountain Gem & Mineral Club, Elks Club; 805 E. Whipple; Sat. 12-7, Sun. 12-5; Adults \$2, Seniors 70+ free, Children 18 & under free. [whitemountain-azrockclub.org](http://whitemountain-azrockclub.org)

**June 3-5 - Flagstaff, AZ** Coconino Lapidary Club, Outdoor Market at Silver Saddle; Highway 89N & Silver Saddle Rd.; Fri. 9-7, Sat. 9-7, Sun. 9-4; Admission: 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**

*DATES SUBJECT TO CHANGE*

**CONSIDER VOLUNTEERING TO PLAN OR HELP PLAN TRIPS. YOU WOULD NOT NEED TO LEAD EVERY TRIP, BUT KEEP THINGS ON TRACK.**

**If you all have some place that you would like to go, let Bob Bartlett 623-388-0749, Marty Hagan 602-469-7770, or Craig Jones 208-681-4770 know. We have some dates to fill in. This is your club. Let's go out and have some fun.**

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

**Officers and Chairpersons**

- President:** Craig Jones .....208-523-9355
- Vice President:** Martin Hagan ..... 602-469-7770
- Secretary:** Judy Zimmerlee ..... 517-652-1355
- Treasurer:** Debra Keiser ..... 928-684-1013
- Program Director:** Dale Keiser ..... 928-684-1013
- Publicity:** currently open position
- Membership:** Roma Hagan ..... 602-469-7662
- Editor:** Susan Celestian ..... 602-361-0739
- Field Trip:** Craig Jones, Bob Bartlett, Marty Hagan
- Show Chair:** Beth Myerson ..... 480-540-2318
- Scholarship Chair:** Steve Hill ..... 928-533-3825
- Historian:** 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 do not 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 2016/2017**

**Wickenburg:** Jan 8, Feb 5, Mar 11, Apr 8, May 13, Sept 9, Oct 14, Nov 11, Dec 9

**Stanton meets** Thursday after the Wickenburg meetings. Jan 14, Feb 11, Mar 17, Apr 14, May 19, Sept 15, Oct 20, Nov 17, Dec 8 (subject to change)



# MINERALS IN OUR EVERYDAY LIVES

Since one of January's field trips was to collect fluorite, this article will feature that mineral and its uses.



Fluorite, Quartz  
China

Fluorite, Sphalerite  
Elmwood Mine, TN



## FLUORITE AKA Fluorospar

Chemical Formula :  $CaF_2$   
Crystal System: Isometric

Habit: cubes, octahedrons, botryoidal  
Color: clear, pink, purple, blue, green, brown;  
often zoned

Luster: vitreous

Streak: white

Hardness: 4

Specific Gravity: 3.18

Cleavage/Fracture: octahedral cleavage



Fluorite - Illinois



Fluorite - Ohio

Fluorite, Quartz  
Homestake Mine, AZ



Fluorite, Barite  
Blanchard Mine, NM

## USES of FLUORITE

### JEWELRY & ORNAMENTAL CARVINGS

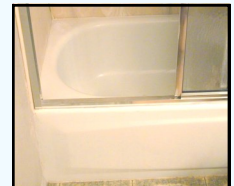


#### CERAMIC GRADE:

Opacifier in enamels (cookware, bathtubs, appliances)

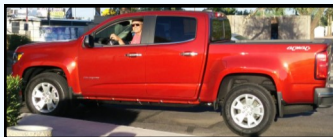
Container glass

Opalescent glass



#### METALLURGICAL GRADE:

Flux to make steel



**ACID GRADE:** Hydrofluoric acid and Hydrogen fluoride—used in processing:

Toothpaste

Refrigerants

Specialty fluorocarbons (medications, anesthetics)

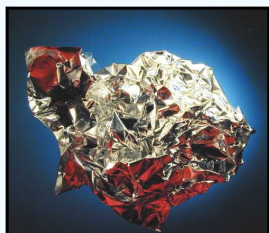
Extraction from bauxite

Teflon

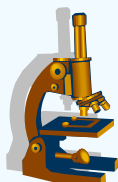
High octane gasoline



All Photos by Stan or Susan Celestian



Aluminum foil



#### OPTICS

Specialty lenses, prisms, windows

