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GNEISS TIMES

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.

Sedimentary Structures: Ripple Marks

By Susan Celestian

Sedimentary structures -- features formed by sedimentary processes -- can variously be helpful in determining characteristics of depositional environments, wind/water flow characteristics, and even the positions of the continents upon the globe.

One type of sedimentary structure is ripple marks. They are crested forms created by moving wind and water. There are two basic forms: *symmetrical* and *asymmetrical*.

Symmetrical ripple marks are wave-formed. The water sloshes to and fro, piling sand grains up in ripples with vertical crests, that slope off symmetrically to the adjacent troughs. See Figure 1.

Asymmetrical ripple marks are current-formed. Flowing water or wind piles up sand into ripples with crests tilted in the direction of the flow. See Figure 1.

In both ripples, small crossbeds form as the wave forms migrate. These may be exposed by erosion. See Figure 1 and 2.

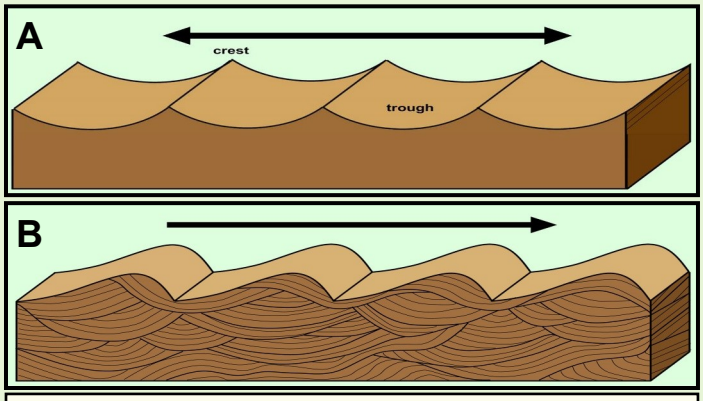


FIGURE 1 Ripple Marks 'A' above depicts symmetrical ripple marks, formed in oscillating water; while "B" depicts asymmetrical ripple marks, formed by a directional current. Note the crossbeds depicted in the cross-section 'A'. *Diagrams by Susan Celestian*

CALLING ALL WRITERS AND PHOTOGRAPHERS!

I, the newsletter editor, would love to get pictures of the club field trips! Trip reports are very welcome too!!! Surely you'd like to hear from someone other than me ☺.

FIGURE 2 Crossbeds in Ripple Marks This exposed vertical cross-section of sediments near Port Townsend, WA exhibits the small crossbeds formed by ripple marks. The coin-for-scale is a quarter. *Photo used with permission of Dan McShane* (https://washingtonlandscape.blogspot.com/search?q=port+townsend)

Ripple marks continued on page 3…..

INSIDE THIS ISSUE

Meeting Minutes — January 5, 2018

The meeting was called to order by Craig Jones at 7 pm, with his tomahawk. The pledge of allegiance was recited. Two groups of new members were introduced. There were no minutes from previous meeting.

Mark and Wayne gave a talk on metal detecting. Your first decision is what machine to buy. Are you interested in treasure hunting or prospecting? Some good brands are Garett, White, Minelab, and Fisher. Prices can be from $300-$8000. The best machines can find things at 16" down. Some machines have a depth gauge, so you know how deep to dig. It is very important to read the owners manual. Practice and get to know your machine. You can tell from sound what you've found. Don't dig holes unless you fill them in. A good practice in a public area is to cut the sod and set it aside; then flip the grass back after you're done. "Scrub" the ground with a flat swinging motion. For gold prospecting, the best machine is pulse induction for mineralized rock. There are prospecting clubs, including The Roadrunners, and GPAA claims. You can use BLM land as long as it's not claimed. Use the Internet to determine the land status, before you head out. Look for quartz float, green and red oxidation, red dirt, and tailings from mines.

The results of the December election: Craig is President, Mel-Vice President, Debbie-Treasurer, and Alyson-Secretary.

The same budget as last year is proposed. We plan to spend down approx. $3800 because we are a non-profit. Don motioned to approve. Paula seconded.

Sue talked about the Mining and Mineral Museum. In the past we have given them $1000. We will wait to see how things are going for now.

We will meet Saturday, January 20th, to go to Dragon Mine area. On Thursday, January 18th, we will meet for breakfast at the Cowboy Cooking Restaurant at 7:30 am, and then drive to the Quartzsite Pow Wow.

The fluorite trip will be rescheduled, probably the 24th. The Vulture Mine trip will also be rescheduled.

Continued...

Show and Tell had Don, Alice, Roger, Dale, and Susie. Alice won the drawing.

Red ticket drawing winners were Jim, Alice, and Sue.

Alice has gotten info on Air Medivac insurance (www.airmedcarenetwork.com). It is strongly suggested we all get it. If you get hurt in the desert, a helicopter pick up might not be covered by your insurance, and can cost thousands of dollars. Additionally, it was suggested that you enroll with two different helicopter evac services, to be sure that their respective geographic coverage areas do not leave you stranded.

Meeting was adjourned at 8:00.

Respected Submitted,
Alyson A.

Green Apophyllite on Okenite Nasik, India
Photo by Stan Celestian

Green Apophyllite on Stilbite Nasik, India
Photo by Stan Celestian

...Ripple marks continued from page 1

Ripple marks form in coarse to fine sands and silts. Coarser sediments are difficult to move. You will often find the coarser sands grains settling in the troughs.

In addition to imparting environmental information, ripple marks can be used to determine the original UP direction, in a bed of rocks. See Figure 3. Often rocks are tilted - even overturned - during mountain-building events, and is often quite useful to determine original UP, so to put pre-deformation events into proper chronological order. Of course, it can be useful to verify original UP in sedimentary rocks that have been undisturbed.

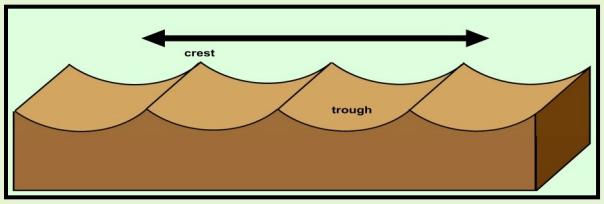


FIGURE 3 Determining Original UP in Sedimentary Rocks The ridges of ripple marks are sharper at the crests than the troughs. This geometry can be used to determine original UP in a sequence of sedimentary rocks (overturned or not). *Diagram by Susan Celestian*

Environmental significance of symmetric ripple marks: Again, these structures form where there are no or weak currents -- where water sloshes or oscillates back and forth. This action is characteristic of shallow aquatic environments, and in deep relatively quiet water. (These are not particularly characteristic of wind deposited sediments, as usually the air is moving in one prevailing direction.) So, we know that the sediments were deposited in water, and that the water was quiet -- standing, sluggish, and/or shallow -- not impacted by strong directional currents. AND the strength of the sloshing (and perhaps of the air flow that generates said sloshing) can be inferred from the size of the ripples. See Figures 4-5.

FIGURE 4 - Symmetrical Ripple Marks This slab is from Coconino Co., Arizona's Lower Triassic-aged Moenkopi Formation in Coconino County, Arizona -- a red, fine-grained sandstone deposited in a fluvial floodplain environment, where shallow, sluggish streams and ponds could be found. *Photo by Stan Celestian*

FIGURE 5 Symmetrical Ripple Marks

These slabs are out of the 1.4-1.47 billion-year-old Belt Supergroup. This section of the supergroup is about 1375-1.4 billion years ago, and comprised of muddy siltstone and mudstones, probably deposited in fairly deep, quiet, low-oxygen water, within a rift basin, where the North American and Columbia/Nuna cratons separated. *Photos by Susan Celestian*

Ripple marks continued on page 4….

...Ripple marks continued from page 4

Environmental significance of asymmetric ripple marks: As described above, asymmetric ripple marks form by directional currents, of wind or water. The result is that the ripple crests are pushed aside, so that individual ripples have a gentle upstream slope, and a steep downstream slope. See Figure 6. From these structures one can establish the presence of flowing wind or water, and from the ripple size/form, and sediment size, determine the strength and direction of that medium. It can be quite helpful, to the reconstruction of the geologic past, to know in what directions paleo-currents flowed. See Figures 6-8.

FIGURE 6 Asymmetric Ripple Marks These photos are views of dune surfaces in White Sands National Monument. The ripple marks "lean" to the right. The arrow indicates the wind direction to the upper right. *Photos by Stan Celestian*

FIGURE 7 Asymmetric Ripple Marks This is a view of the Columbia River, near Crescent Bar, from a terrace near Wenatchee, Washington. Believe it or not, the hills in the middle of the photo are in fact ripple marks, in river gravels and sands. They resulted from catastrophic flooding, resulting from the failure of ice dams on the Clark Fork River, behind which Glacial Lake Missoula formed, in western Montana, during the last Ice Age. This lake held about half the volume of water in today's Lake Michigan, but drained many times, with water rushing out at estimated rates of between 4 and 14 cubic miles/hour!! At the time of the flood that created these ripples, the river have been over 500 feet deep -- in fact, this overlook would have been under water. The arrow indicates the direction of water flow. *Photo by Susan Celestian*

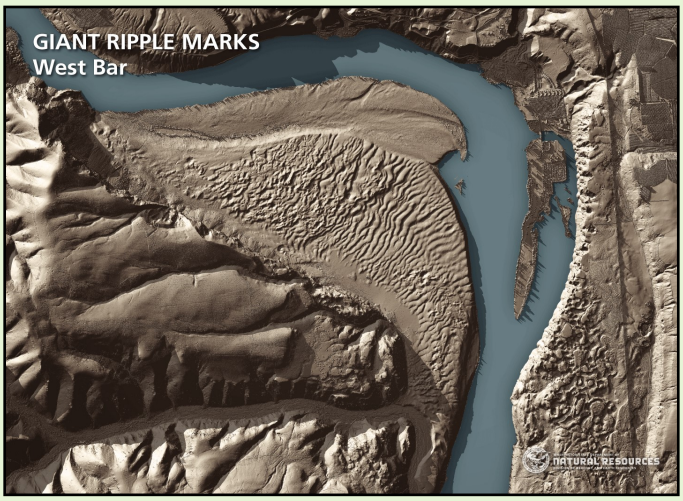


FIGURE 8 Giant Ripple Marks This is a Lidar image of giant ripple marks on a bar within the Columbia River -- similar to those in Figure 7. *Image courtesy of the Washington Department of Natural Resources*.

UPCOMING WGMS FIELD TRIPS

WHEN: Wednesday, January 31, 2018
WHERE: 4th of July Peak
WHAT: Chalcedony

WHEN: Saturday, February 3, 2018
WHERE: Vulture Mine
FEE: $15/person

WHEN: Monday, February 1, 2018
WHERE: Surprise! Details at meeting
WHAT: Details coming

WHEN: TBA
WHERE: Bullard Mine
WHAT: Chrysocolla

WHEN: Tuesday, February 20, 2018
WHERE: Robson World
WHAT: Mining History
FEE: $15/person

Other Possible Outings: Signal City, Mushroom Rhyolite, Black light Potluck, Bagdad, Burro Creek

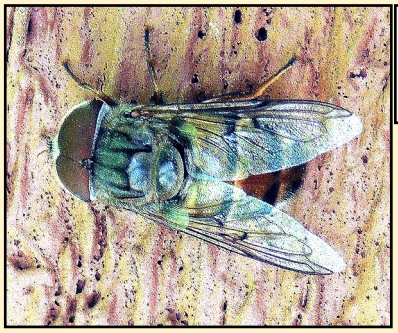
CONSIDER VOLUNTEERING TO PLAN OR HELP PLAN TRIPS. YOU WOULD NOT NEED `TO LEAD EVERY TRIP, BUT KEEP THINGS ON TRACK

If you all have some place that you would like to go, let Craig J. 208-523-9355 or 208-681-4770. This is your club. Let's go out and have some fun.

DATES & PLACES SUBJECT TO CHANGE

DESERT INSECTS -- There are more than rocks out there! *All photos are by Susan Celestian.*

Potter Wasp nest (*Eumenes sp.*)



Hoverfly

Blue Fungus Beetle (*Gibbifer californicus*)

Western or European honey bee (Apis mellifera)

Sweetclipart.com

Master Blister Beetle (Lytta magister) The juice of this beetle is used to remove warts (our daughter had this done - OUCH). Don't tangle with this insect.

Monarch (Danaus plexippus) caterpillar (below) and chrysalis (right). The Monarch Butterfly is attracted to Desert Milkweed. *Photos by Susan Celestian*

UPCOMING AZ MINERAL SHOWS

January 1-February 28 - Quartzsite, AZ Various shows: Desert Gardens, Tyson Wells; For more information go to: https://www.desertusa.com/cities/az/quartzsite.html#anchor832166

January 19-February 11- Tucson, AZ There will be many separate shows throughout Tucson during this period. For a general schedule, go to: http://www.tucsongemshows.net/coming.html

January 19 - February 11 - Marana, AZ Smoky's Miner's Co-op; 6901 N Casa Grande Hwy; Daily 8:30-6; Admission: free.

February 8-11 - Tucson, AZ Tucson Gem and Mineral Society; Tucson Convention Center; 260 S Church Av; Thur-Sat 10-6, Sun 10-5; Admission: $13, children 14 and under free.

February 8-11 - Mesa, AZ Apache Jct Rock and Gem Club; Skyline High School, 845 S Crimson Rd.; Sat 9-5, Sun 10-4; Admission: $3 adults, $1 students, children 12 and under free.

March 10 - Coolidge, AZ Pinal Gem and Mineral Club; Artisan Village of Coolidge, 351 N Arizona Blvd.; Sat 10-4; Admission: free.

March 24-25 - Anthem, AZ Daisy Mountain Rock and Mineral Club; Boulder Creek High School Gym, 40404 N Gavilan Peak Pkwy; Sat 9-5, Sun 10-4; Admission: $3 adults, $2 seniors and children, children 12 and under free.

If you are travelling, a good source of 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/shows.php?current=1

A good source for a list of Arizona Mineral Clubs and contact information is http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html

Ogyginus corndensis A Lower Ordovician trilobite, from the Llanvirn Stage, Bifidus Zone (About 480 million years old) in Gilern Hill, N Builth Wells inlier, Powys, Wales, Great Britain. The fossil is 3.57 inches long. *Photo by Stan Celestian*

Officers and Chairperson

President: Craig Jones..... 208-523-9355
Vice President: Mel Canter 502-641-3118
Secretary: Alyson Arnold 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 J, Alice & Jim S.
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 2018

Wickenburg: Jan 12, Feb 2, Mar 9, Apr 13, May 11, Sept 14, Oct 12, Nov 9, Dec 7

Stanton meets Thursday after the Wickenburg meetings. Jan 18, Feb 8, Mar 15, Apr 19, May 17, Sept 20, Oct 18, Nov 15, Dec 13 (subject to change)

http://www.wickenburggms.org/

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

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.

I would love to have some pictures from field trips! Snap a couple and send them to me.

Deadline for the newsletter is the 27th of the month.

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