



## Wickenburg Gem & Mineral Society, Inc.

P.O. Box 20375, Wickenburg, Arizona, 85358

E-Mail — wgmcommunity@gmail.com

[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.*

## Sedimentary Structures: Sole Marks -- Flute Casts & Load Casts

By Susan Celestian

As water flows over a stream bed; as flowing water pushes objects along a stream bed; as saturated sediments of differing densities are deposited one on the other; and as turbidity currents travel over pre-existing sediments, markings, grooves, and other depressions are often formed. These depressions later fill with sediment, and may be preserved. Collectively, they are referred as **sole marks**, as they typically display as bulges on the underside of an exposed bedding plane.

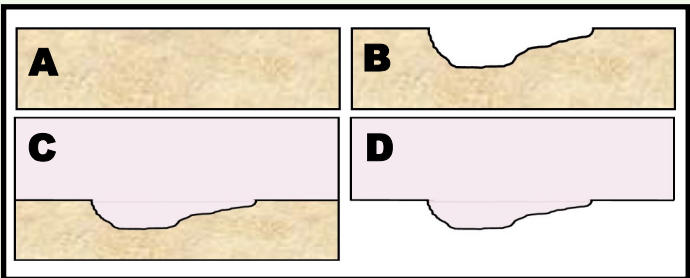
For the purposes of this article, I will consider only **flute casts and load casts**. The other sole marks are not terribly different than flute casts.\*

**FLUTE CASTS** have a bulbous scooped out depression, leading into a shallower flared depression. See Figures 1-2.



**FIGURE 1 Flute Casts** These flute casts formed in the Jurassic Moenave Formation, and were exposed at Johnson Farm -- now the St. George Dinosaur Discovery Museum -- in St. George, Utah.

*Photo by Susan Celestian*



**FIGURE 2 Formation of Flute Casts** (A) A layer of brown sand is deposited. (B) A current gouges out a deep-shallow depression, in the brown sand. (C) A layer of pink sand is deposited over the brown sand. The rock layers are subsequently lithified. (D) The two rock layers are subjected to weathering and erosion, removing the brown sand and leaving behind a layer of pink sand, with a bulging lower surface. Normally, you will find the pink rock layer with the bulge displaying on the upper surface -- but it was originally the lower surface.

*Illustration by Susan Celestian*

**Environmental significance of flute casts:** Flute casts are very often created by turbidity currents, but they can be produced by scouring by any turbulent flow.

They can be used to determine original UP, as they occur on the bottom of a sedimentary layer. And they also indicate paleo-current direction, with the deeper, bulbous end occurring in the up-current direction. Refer to the arrow in Figure 2.

*\*Tool marks are depressions created as sticks or other objects are pushed, dragged, rolled, or skipped along the stream bed. Groove casts are actually very thin, low, linear doublet or triplet grooves formed by turbidity currents.*

*Sole marks continued on page 2.....*

### INSIDE THIS ISSUE

Sedimentary Structures - Flute Casts & Load Casts	1-2
Minutes	2
Hawaii Erupts (Then & Now)	3-4
For Sale	5
Field Trips Upcoming, Show List, Club Information	6

## Meeting Minutes — May 11, 2018

The meeting was called to order by Vice president Mel C, after a potluck dinner with 15 people in attendance. The pledge of allegiance was said. A new youth member, Bohdy, was introduced.

The minutes for the April meeting were approved as presented in the newsletter. The treasurer report was approved as presented by Debbie.

Unfinished Business:

New Business: The Rocky Mountain Federation show will be held in Rapid City South Dakota July 20-22.

Scholarship: Five Scholarship applications were presented to the board members. None of the students fit the stipulations of the application, so no earth science scholarship will be given this year.

Club Show Saturday November 24<sup>th</sup> 9AM-5PM and Sunday the 25<sup>th</sup> 10AM-4PM: Debbie C and Robbie B will be helping Beth with the show this year.

Next Field trip will be in October. It was suggested that two vehicles scout the proposed trip area prior to taking a big group out. They will determine the difficulty and what rocks will be available for collecting.

Show and tell prize was won by Bohdy and the first door prize winner was also Bohdy. Followed by Debbie C, Beth and Alice.

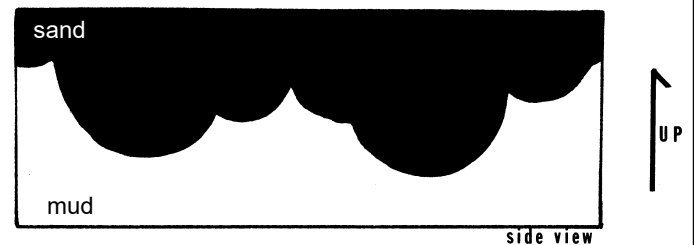
Mel C gave a presentation on collecting minerals specimens. With his microscope and computer set up we were able to identify tiny mineral crystal formations.

Next meeting will be October 12 with a pot-luck dinner starting at 6PM.

Respectfully Submitted,  
Debbie K.

...Sole marks continued from page 1

**LOAD CASTS** form when a dense sedimentary layer (generally sand), sags into a saturated, less dense layer -- often mud -- below. See Figures 3-4.



**FIGURE 3 Load Casts** This diagram illustrates lobes of a sandstone sagging into the saturated layer below. *Illustration by Susan Celestian*



**FIGURE 4 Load Casts in Stone** These load casts (yellow arrow points to them) formed within layers of the Triassic Moenkopi Formation (I think). *Photo by Stan Celestian*

**Environmental significance of load casts:** Load casts give one a sense of the sedimentary conditions at the time of deposition. Additionally, like flute casts, they can indicate original UP (refer to the UP arrows in Figures 3-4).



# Pu'u 'O'o Eruptions Ramp Up

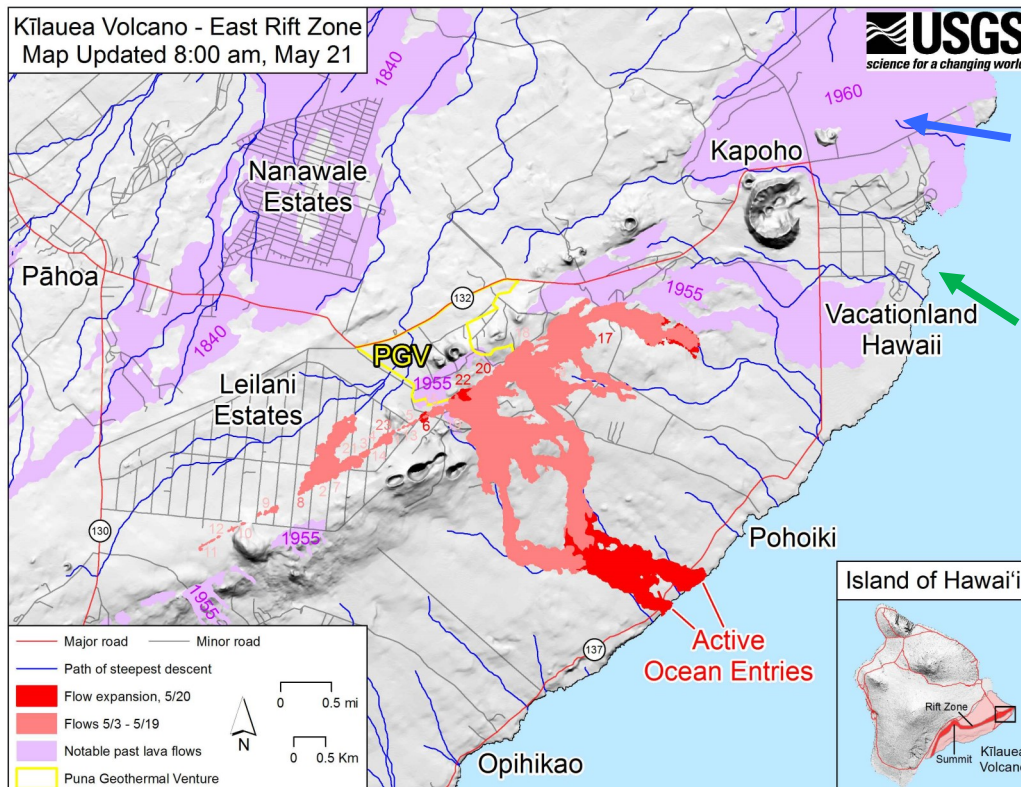
By Susan Celestian

The Big Island of Hawaii is dominated by the two peaks of the massive volcanoes, Mauna Kea and Mauna Loa. Eruptions from these two volcanoes have built the island. Both are over 33,000 feet tall, rising about 13,800 feet above sea level. Kilauea is a parasitic cone (rising 4200 feet) occupying the southeastern side of the island, on the flanks of Mauna Loa; and Pu'u 'O'o is a volcanic crater, within the East Rift Zone. It is from Pu'u 'O'o from which the current eruption issues. In fact, this eruptive phase began in January of 1983, and the volcano has been erupting almost continuously for the last 35 years.

*Just a note: Stan and I first visited Hawaii in July of 1983, and were very lucky to snag a helicopter ride over the flowing lava. Actually, we spent 2 nights in Volcano House prior to an eruption, and as we had to leave for Kona, we took a helicopter ride over the crater of Pu'u 'O'o. The night after our arrival in Kona, the volcano erupted along fissures. We called the helicopter company, and told them we were on our way back. Katia and Maurice Krafft (French volcanologists) had already reserved the copter, in the event of an eruption. Upon arrival at the helicopter office, we were faced with a crowd of people waiting for their turn at a flight. Either our phone call put us at the top of the list, or the staff took a liking to two poor (and I do mean poor) geology professors, but as soon as the Kraffts completed their aerial foray, we were ushered out to the waiting helicopter. Talk about excited!!! We were snapping pix as quickly as we could, when I noticed our 6-year-old daughter just sitting there with her camera in her lap. I hollered in her ear (it's very noisy in a helicopter), and she told me that she was "very disappointed" --- the eruption was not a column spouting from the crater. I told her to take pictures, and we'd talk about it later. She was so young, she probably has no vivid recall of the event, but despite her disappointment, it was AWESOME. Spatter cones, red hot lava flowing out of slit-like fissures, overseen by the glowing round hole of the crater. Last summer, we were witness to an almost continuous sputtering of 50-100' tall fountains of lava within the Halema'uma'u crater within Kilauea caldera. (See photos on page 10-11. Go to <https://www.youtube.com/watch?v=IRfZ2q4Jvmo> for video of lava flowing to the sea, and <https://www.youtube.com/watch?v=-vTw3gqjEU4> for a video of the plume within Halema'uma'u crater 2013.)*

Now the majestic and destructive/constructive power of the volcano is demanding attention!  
 Vog, Laze, and Lava -- aha! \*

\*Vog is a mix of volcanic gases, such as sulfuric dioxide, smog, and fog. Laze is a mix of hydrochloric acid and fine glass particles. Lava is molten rock flowing on the Earth's surface.



This USGS map illustrates the volcanic history of the currently impacted area. The purple areas are past lava flows, and red marks the current flows.

At least 22 fissures have opened up in Leilani Estates. At least 40 buildings have burned. Noxious gases are adrift. The rain forest is being overrun and burned. Over 2200 earthquakes have been generated (largest M6.9). And on May 19, lava flows met the sea.

The blue arrow points to a massive flow from Jan-Feb 1960. The green arrow points to the author's favorite vacation area -- Kapoho Tidepools (Wai'opae Tidepools Marine Life Conservation District). We fear that it will either be overrun by lava, or the gases and heat will kill the coral and change the ecology.

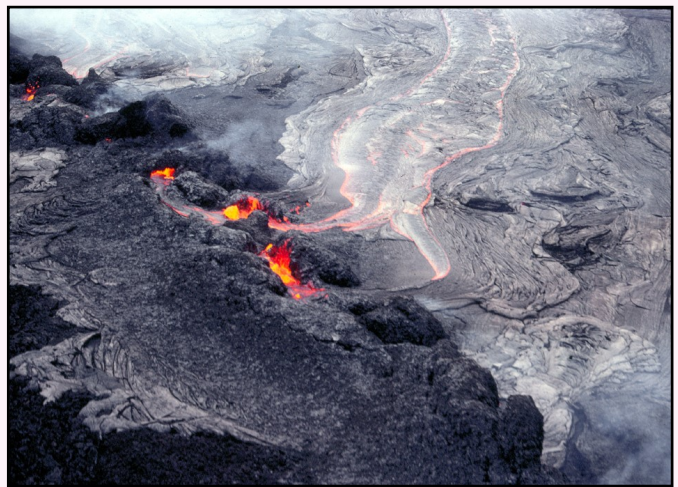
Hawaii continued on page 4.....



...Hawaii continued from page 3



Pu'u 'O'o vent in July 1986. Photo by Susan Celestian



A



B

Borrowing colors from the volcanoes upon which they live are the (A) Red-crested Cardinal (*Paroaria coronate*) and the (B) Yellow-beaked Cardinal (*Paroaria capitata*). Photos by Susan Celestian



Fissures, spatter cones, and lava flows issuing off the flanks of Pu'u 'O'o in 1986. Photos by Susan Celestian



Nighttime photos of fountains within Haleuma'uma'u Crater within Hawaii Volcanoes National Park, in May 2017. Photos by Susan Celestian



## FOR SALE \$300

8" All-U-Need Lapidary Machine by Hi-Tech Diamond. Cost new is \$600 (<https://hitechdiamond.com/shop/all-u-need-lap-machine-rock-mineral-model/>). This unit is barely used, and includes all the original disks: 180# diamond disk/backing plate, 325# brown disk/backing plate, 600# red disk/backing plate, 1200# blue disk/backing plate, a white polishing pad/backing plate upon which 14,000# diamond paste has been used, and a copper-colored disk that is I think another kind of polishing disk. All have lots of life left in them (the copper one has never been used).

The unit works great for producing cabochon. If you are short on space, or don't want to dedicate a large space to grinding and polishing, this is the machine for you!

EFFECTIVE! COMPACT! AFFORDABLE!



If interested, contact Stan/Sue Celestian [stancelestian@gmail.com](mailto:stancelestian@gmail.com) or 602-361-0739.

*Do you have something hobby-related to sell? Send me an ad, and I'll put it in the newsletter.*

**UPCOMING AZ MINERAL SHOWS**

**June 1-3 - Flagstaff, AZ** Coconino Lapidary Club; Silver Saddle Outdoor Market, 9001 US 89 N (US 89N & Silver Saddle Rd); Fri-Sat 9-5, Sun 9-4; Admission: free.

**July 7-8 - Pinetop, AZ** White Mt. Gem and Mineral Club; Hon-Dah Casino & Resort, 777 Highway 260; Sat 9-6, Sun 9-4; Admission: \$2.

**August 3-5 - Prescott Valley, AZ** Prescott Gem and Mineral Club; Prescott Valley Event Center, 1301 Main St.; Fri-Sat 9-5, Sun 9-4; Admission: Adults \$5, Seniors/Students \$4, children under 12 free with paid adult.

**October 13-14 - Sierra Vista, AZ** Huachuca Mineral and Gem Club; Cochise College, 901 N Colombo Av; Sat 9-5, Sun 10-4; Admission: 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](http://whitemountain-azrockclub.org/Public_AZ_Clubs_Links.html)

**HAVE A GREAT SUMMER!**  
**SEE YOU IN OCTOBER.**



**UPCOMING WGMS FIELD TRIPS**

No Upcoming Field Trips Planned at this Time

DATES & PLACES 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 Schneiders or Craig J. 208-523-9355 or 208-681-4770. This is your club. Let's go out and have some fun.

**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, 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 -- or a link -- to me.

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

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

Susan Celestian, editor  
For Wickenburg Gem and Mineral Society, Inc  
6415 N 183rd Av  
Waddell, AZ 85355