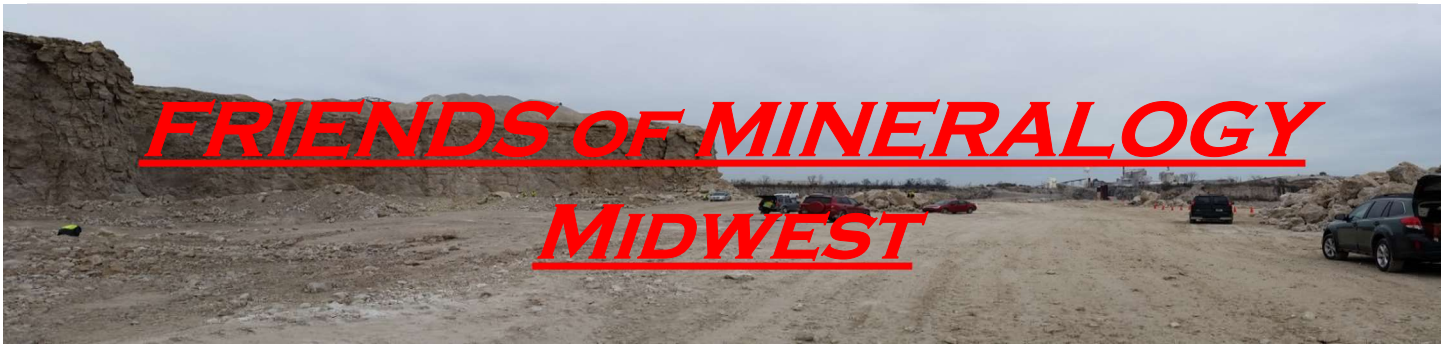


FRIENDS OF MINERALOGY MIDWEST

Midwest Chapter Newsletter for May – June 2020

In this Issue:

Message from a Past-President

Dear Friends,

With the present pandemic, these are trying times for all, and very difficult times for some. There will be future consequences for most. Our chapter will have its own unique problems. We weren't able to have our annual safety and hazard training this Spring, and it remains to be seen if we can even arrange any training this year. This will affect our ability to get into most quarries in Ohio. We may have to consider out-of-state trips that don't require us to have training certificates.

We haven't had a fund raising committee chairman for some years, and Randy Marsh has taken up the slack by running a 'swap table' at Geofair for the last several years. Geofair has been cancelled this year. Therefore, money that we usually raise will not help our treasury.

Which brings me to the main point of this missive. Unrelated to the COVID-19 epidemic, we also don't have a president or vice-president of programs. Under normal circumstances, this would be bad enough. However, we are going to need leadership to take the initiative to address the consequences of the lockdown, address the probable decline in chapter membership (and income) if we don't have field trips, and to coordinate planning for the future.

It would be unthinkable for a ship to embark on a voyage without a captain and first mate. But, here we are in a situation where we have a willing crew, but no one to direct the ship to its destination and deal with the rough weather ahead.

This is an unprecedented situation of not having two key officers. I think that we can resolve the problem by having the executive committee appoint volunteers as acting, interim officers, and then have them formally elected at our November business meeting, should they be willing to continue.

However, this is contingent on having members who are willing to volunteer to fill the vacant positions. Ideally, these would be people with a vision of how to improve the organization, and experience in running small organizations. However, the latter is not a requirement if you can think on your feet and are willing to learn on the job. If in doubt, you can ask for advice from the executive committee or past officers. They will be more than happy to provide help. The important thing is being willing and able to devote time to the job, and a desire to improve the organization.

To paraphrase President Kennedy, "Ask not what your chapter can do for you, but what you can do for your chapter".

In summary, we are in desperate need of volunteers to serve as President, VP of Programs, and Fund Raising Chair. Please contact one of the officers listed at the end of this newsletter if you are willing to serve. For information on the duties and responsibilities of the open offices, please see our chapter constitution at "http://www.fommidwest.org/wp-content/uploads/2016/01/FMMW_Constitution.pdf".

Respectfully,
Clyde Spencer

Treasurer's Report

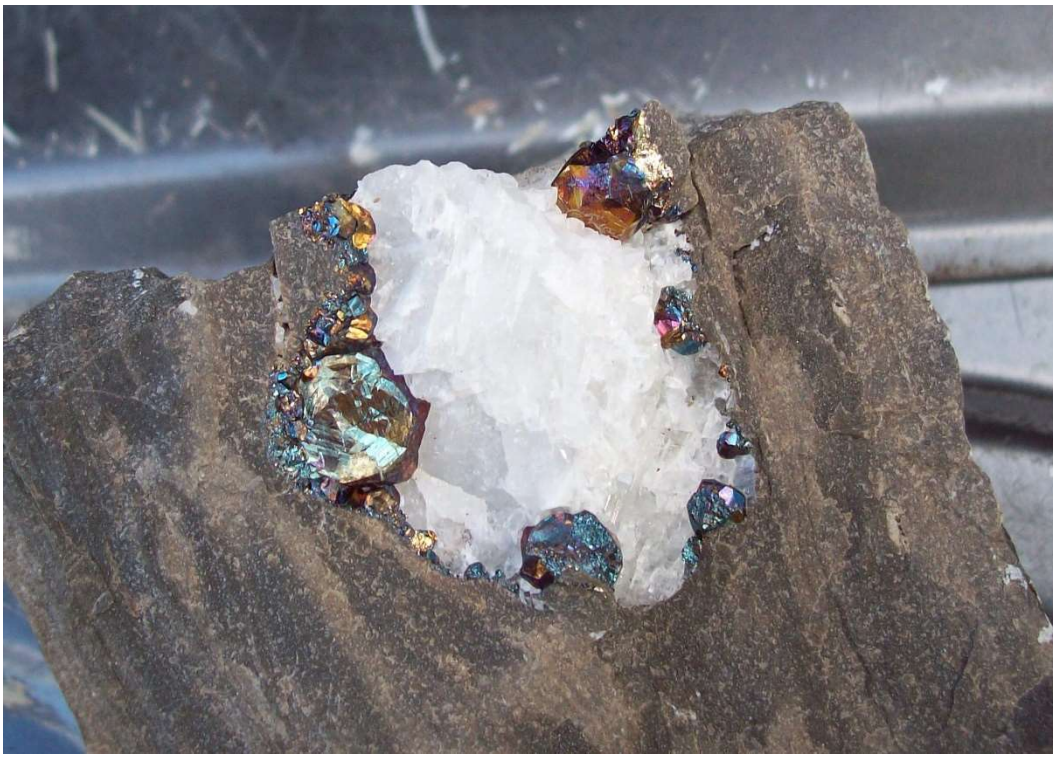
Treasurer@fommidwest.org

Friends of Mineralogy Midwest Chapter Interim Treasurer's Report – April 15, 2020

The table below shows our revenue and expenditures to date for 2020. Currently only 82 members out of the 100 we had last year have registered for 2020. It's a challenging time for our organization but we are financially sound.

2019 Ending Balance	$8707.29	Includes 42 2020 dues payments
2020 Additional dues payments	$800.00	
2020 Additional donations	$105.00	
2021 dues pre-payment	$20.00	
National Dues paid 4/7/2020	$(328.00)	
Insurance premium	$(650.00)	
Current Balance	$8654.29	
Federal 990-N filing-2019	completed	
State Annual report-2019	completed	
2019 Internal Audit	needs completion	Frank Konieczki has volunteered.

Jeff Spencer – Treasurer
Friends of Mineralogy Midwest Chapter



A picture from the past - Duff Quarry 2013

Effects of Ultraviolet Light on Calcite formed in Amygdaloids and other Spaces in Basalt

by Calvin Harris

Introduction

The purpose of this essay is to describe observations regarding effects ultraviolet radiation has on calcite that has formed in basaltic amygdaloids and other spaces related to basaltic flow. Amygdaloids develop when gases escape extrusive igneous rock and form vesicles or small openings within the rock formation as it cools. The mineral that infills the amygdaloid openings is called an amygdule. When the flow of multiple basaltic forms called pillows intersect, open areas can become available. Features such as lava tubes are areas where mineralization can take place. Calcite forms as a secondary mineral from low temperature hydrothermal solutions (~100 degrees Celsius) or rain water that percolated through openings within the host rock. The cavities can also be infilled with quartz, chlorite and zeolites that form from low temperature hydrothermal solutions. The specimens pertaining to this essay originated from the following localities: Prescott, Arizona; Upper New Street Quarry (Burger's Quarry), Passic County, New Jersey; Eagle County, Colorado; Gopher Valley Quarry, Yamhill County, Oregon.

Specimen Description

The specimen from Prescott, Arizona consists of amygdules in basalt. This specimen is disk shaped with a 15 cm circumference; it has a thickness of 5 cm and has a weathered appearance. The calcite consists as large grains up to several centimeters in length and width, appears white under daylight conditions and is disseminated on the obverse (bulging) and reverse (flat) areas of the rock.

Prescott Arizona - Daylight

The sample collected from Upper New Street Quarry (Burger's Quarry) is a combination of calcite crystals with minor amounts of the zeolites, pumpellyite and natrolite on a basalt matrix and likely formed within a cavity. The calcite crystals are simple rhombohedra and are approximately 3 mm x 4 mm in size and appear white when viewed in daylight. The matrix of this specimen was sawn and is wedge shaped; it measures 8 cm x 5 cm x 2 cm.

Eagle County Colorado - Daylight

The specimen from Eagle County, Colorado consists of rhombohedral calcite crystals inside a pocket within basalt. The crystals appear light tan in daylight and are approximately 0.5 cm in size. The shape of this pocket is irregular and is about 5 cm. x 5 cm. x 3 cm in depth. Overall, the specimen is approximately 10 cm x 8 cm x 5 cm and features openings indicative of gas escaping the basalt as it cooled. The reverse side of this specimen clearly exhibits amygdales and amygdaloidal features.

The sample from Gopher Valley Quarry consisting of simple rhombohedral calcite crystals perched on a basalt matrix; the crystals have a butterscotch color in daylight. Small open spaces on the matrix's surface highly suggest that gases escaped the basalt during cooling. The calcite crystals are simple rhombohedra and the largest is 4 cm x 3 cm x 1 cm. This specimen is roughly disk shaped with a 13 cm diameter and a thickness of 5 cm.

Test Procedures

An individual specimen was placed approximately one inch from each ultraviolet source to evaluate the color and intensity of fluorescence and phosphorescence. At least a five second exposure time was used to determine phosphorescent color during its peak duration; exposure time and the duration of phosphorescence was also noted.

The conventional ultraviolet sources used include three, SuperBright II lamps and one SuperBright III unit. These are portable units that operate using AC and DC electric sources. The lamps emit wavelengths 254nm (short-wave), 312nm (mid-wave), 351nm (long-wave) and 370nm (long-wave) respectfully. A lead-acid battery was used to supply electric current. This equipment is manufactured by UV SYSTEMS, INC., which is based in Renton, Washington.

A Vivitar 283 battery powered photographic flash unit was employed as a means to produce a momentary, vivid phosphorescent effect colloquially known as *flash.* The specific ultraviolet wavelength of this unit has not been determined; however, when used at its maximum output setting, it can evoke a red-orange response in calcite, which is likely due to the presence of manganese as an activator. This reaction compares favorably to the red-orange response gained when using conventional sources of ultraviolet radiation. Interestingly, this tool has the ability to evoke *flash* in some calcite specimens while conventional UV sources could not produce this result. The Vivitar 283 also has the capability to stimulate phosphorescence and for many years spelunkers have observed this effect when photographing speleothems using similar lighting devices. Speleothems cave formations that are typically composed of calcite or its polymorph aragonite.

Prescott, Arizona Shortwave UV

Eagle County Colrado Shortwave UV

Test Results from Ultraviolet Radiation Exposure

(Abbreviations: fl = fluorescence; phos = phosphorescence; exp. = exposure; sec. = seconds)

Specimen identification	Prescott, Arizona	Street Quarry (Burger's Quarry)	Eagle County, Colorado	Gopher Valley Quarry
Short-wave (254nm)	**fl**: white w/blue tint, moderate intensity; **phos**: greenish-white w/25 sec. exp., 5 sec. duration; weak intensity.	**fl, phos** white w/green tint, moderate intensity. **phos**: 10 sec. exp., 5 sec. duration.	**fl**: cream w/blue tint; moderate/bright intensity. **phos**: moderate/bright blue w/5 sec. exp, 11 sec. duration.	**fl**: white w/blue-green tint; bright intensity. **phos**: color similar to fl after 5 sec. exp; moderate intensity; 9-10 sec. duration.
Mid-wave (312nm)	**fl**: color shift toward green, moderate intensity. **phos**: bluish-white w/25 sec. exp., 5 sec duration, very weak intensity.	**fl, phos**: same colors, but, more vivid than short-wave; moderate intensity. **phos**: 10 sec. exp., 5 sec. duration.	**fl**: white w/yellow-green tint; bright intensity. **phos**: lime green w/ 5 sec. exp, 13 sec. duration, moderate intensity.	**fl**: color toward green w/greater intensity than short-wave; **phos**: response similar to short-wave.
Long-wave (351nm)	**fl**: Less bright and slightly greener than mid-wave. **phos**: very weak intensity, color un-determinable w/25 sec. exp., 2 sec duration.	**fl**: similar color to short-wave, moderate intensity. **phos**: greenish-white w/10 sec. exp., 3 sec., duration, moderate intensity.	**fl**: cream, moderate intensity. **phos**: lime w/10 sec. exp, 10 sec. duration; moderate intensity.	**fl, phos** similar to mid-wave; **phos**: 9 sec. duration.
Long-wave (370nm)	**fl**: exhibits cream w/bluish tint, moderate intensity. **phos**: greenish-white, very weak intensity w/ 25 sec. exp., 2 sec duration.	**fl**: white w/greenish tint moderate intensity; **phos**: white w/10 sec. exp., 2-3 sec. duration; very weak intensity.	**fl**: white w/ cream tint, moderate/bright intensity. **phos**: lime w/ 10 sec exp., 10 sec duration, moderate/dim intensity.	**fl**: moderate-bright, lemon-yellow; **phos**: moderate-bright white color after 5 sec exp. duration: 9 sec.

Photographic strobe (phosphorescence)	No effect.	Creamy-red ***flash***; bright intensity, 1 sec., duration.	Cream color ***flash***, moderate/ bright intensity, 2-3 sec., duration.	Bright lime-green **phos**, 6 sec. duration.

Discussion

The various dimensions of open spaces related to mineral infiltration of the host rock does not appear to have any significant luminescent outcome among the samples evaluated. The fluorescent responses were pastel colors and intensity that were closely related. Longer wavelengths produced a shift from a blue to a green chromatic response. The phosphorescent responses were more varied regarding the amount of exposure time needed for assessment, as well as, intensity and duration. Regarding *flash*, the results were distinct or nonexistent.

The test results from the conventional sources of ultraviolet radiation approximate results attributed to organic activators associated with calcite. These activators cause a whitish and pastel fluorescent and phosphorescent response to different ultraviolet wavelengths. The *flash* caused by the photographic flash unit suggests that manganese is present, which functions as an inorganic activator. However, specialized equipment such as a high resolution Raman spectrophotometer can provide the means to identify the activators with certainty.

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National Website:

www.friendsofmineralogy.org

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Our purpose is to organize and promote interest in and knowledge of mineralogy; to advance mineralogical education; to protect and preserve mineral specimens and promote conservation of mineral localities; to further cooperation between amateur and professional and encourage collection of minerals for educational value; and to support publications about mineralogy and about the programs of kindred organizations.