

The CMS Tumbler

October
2021



The monthly newsletter of the Cascade Mineralogical Society, Inc., Kent, Washington

Next Meeting:
October 14, 2021
7:00 p.m.

American Legion Hall
25406 97th PI S
Kent, WA

The Program is two videos, one on
cleaning saw oil off slabs, and one
on stabilizing softer material

The Show & Tell
Theme is lapidary items, polished
rocks or slabs, cut gemstones,
cabochons, intarsia, etc. that
you have made

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Connect with us!

Website: <https://www.cascademineralogicalsociety.org>
Club Facebook: <https://www.facebook.com/CasMinSoc/>
Show Facebook: <https://www.facebook.com/cascadegemandmineralshow>
Instagram: <https://www.instagram.com/cascadegemandmineralshow/>

This month remember
to wish a

Happy Birthday to
Kat Koch on October 4
Charles Benedict on October 6
Hailey Machin on October 11
Keith Alan Morgan on October 11
Linda Allred on October 14
Sherrie Hill on October 14
Brett Petty on October 15
William Donovan on October 19
Tyra Hart on October 20
Jamie Pearson on October 25
Brandon Harper on October 29
Fred Thompson on October 30



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Tips, suggestions, recipes and experiments printed in this newsletter are the experiences and/or opinions of the individuals submitting them. We are not responsible for their authenticity, safety, or reliability. Caution and safety should always be practiced when trying out any new idea.

CMS Club Address
25838 W LK Wilderness Dr. SE.
Maple Valley, WA. 98038

Keith Alan Morgan, Editor
3802 W Tapps Dr. E
Lake Tapps, WA 98391

Postal, or Email, Exchange
Bulletins are welcome.
Email preferred.
greenrockdraggin@yahoo.com

2021 Elected Officers

<i>Title</i>	<i>Name</i>	<i>Phone</i>	<i>E-mail</i>
President	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Vice President	Merriann Fu	253-236-5593	merriannf@gmail.com
Treasurer	Charles Benedict	425-306-0465	charlesbenedict@comcast.net
Secretary	Pete Williams	425-228-5063	petewill02@gmail.com
Director	Roger Pullen	206-387-3214	None
Director	Roger Danneman	425-228-8781	Roger.Danneman@gmail.com
Director	Richard Russell	253-736-3693	richru1@yahoo.com
Past President	Bob Pattie	425-226-3154	bobpattie@comcast.net
Show Chairman	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Federation Representative	Michael Blanton	425-271-8757	mblanton41@hotmail.com
Federation Representative	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Mineral Council	Diana Horsfall	206-818-9507	dianahorsfall@comcast.net
Mineral Council			

2021 Show Committee Chairs

Cascade Show	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Cascade Show	Co-Chair		
Cascade Show	Treasurer Pete Williams	425-228-5063	petewill02@gmail.com
Cascade Show	Silent Auction Michael Blanton	425-271-8757	mblanton41@hotmail.com
Cascade Show	Raffle Donations Michael Blanton	425-271-8757	mblanton41@hotmail.com
Cascade Show	Demonstrators Richard Russell	253-736-3693	richru1@yahoo.com

2021 Committee Chairs

Club Historian			
Donations	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Field Trip	Roger Danneman	425-228-8781	Roger.Danneman@gmail.com
Health & Welfare	Bev Williams	425-228-5063	britbev1957@outlook.com
Library	Bob Pattie	425-226-3154	bobpattie@comcast.net
Meeting Programs	Miriann Fu	253-236-5593	merriannf@gmail.com
Membership	Mark Hohn	253-332-3736	showchair@cascademineralogicalsociety.org
Newsletter - Tumbler Editor	Keith Alan Morgan	253-439-9471	greenrockdraggin@yahoo.com
Open Shop	Instructors Bob Pattie	425-226-3154	bobpattie@comcast.net
Public Relations	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Refreshment	Angie Bayer	253-631-3840	angiemc61@msn.net
Raffle/Display	Roger Pullen	206-387-3214	None
Shop Operations	Bob Pattie	425-226-3154	bobpattie@comcast.net
Show & Tell	Michael Blanton	425-271-8757	mblanton41@hotmail.com
Social Media	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Webmaster	Mark Hohn	253-332-3736	showchair@cascademineralogicalsociety.org

2021 CMS Dues are \$15 per year per family

Pay online, by mail, or at our meetings.

Mailing Address: Charles Benedict, 25838 W Lk Wilderness Dr SE, Maple Valley WA 98038

You can pay your dues via credit card!! We now accept all cards through our website or at the meeting.







You can renew your membership or enroll as a new member and pay your dues all in one shot online. You will find it under the "Membership" tab on our website. <http://www.cascademineralogicalsociety.org>

The object of the Society shall be to stimulate interest in the study of the earth sciences, lapidary arts and related subjects.

This Society is affiliated with the American Federation of Mineralogical Societies; the Northwest Federation of Mineralogical Societies; and the Washington State Mineral Council.

Every member of the club should be receiving a copy of the Northwest Newsletter. If you are not receiving a copy contact Mike Blanton in person or by telephone at (425) 271 -8757 or by computer at mblanton41@hotmail.com

To get information to the Tumbler via the Internet send it to greenrockdraggin@yahoo.com Please put Tumbler and subject in the Subject Line. The deadline is the 20th of each month.

Sun	Mon	Tue	Wed	Thur	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11 Board Meeting 7:00 pm	12	13	14 General Meeting 7:00 pm	15	16 Red Top Trip
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31 						

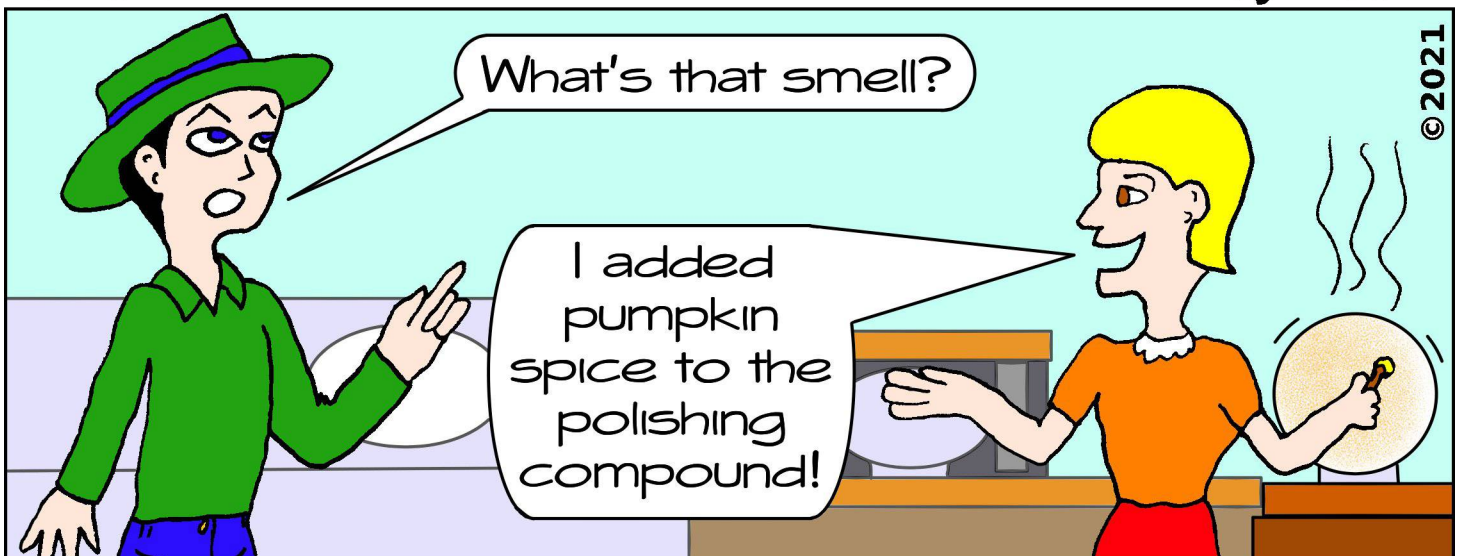
CMS Board Meeting:.....Monday, October 11.....7:00 pm to 8:00 pm
 CMS General Meeting:.....2nd Thursday, October 14.....7:00 pm to 9:00 pm

Lapidary Class Hours:.....By appointment, call to set a time & day for your lesson (425) 226-3154
 Lapidary Shop Hours:.....Most Tuesdays..... 2:00 pm to 5:00 p, call ahead (425) 226-3154
 Lapidary Shop Hours:.....3rd Saturday..... by appointment only (call a few days ahead to set time)

More Field Trip info can be found on Page 15
 More Show info can be found on Page 16

Smell

by KAM



The Tumbler has received One-Time Rights to publish this cartoon

Our Club is a Member of these Federations and Associations

AFMS: The AFMS governs our Northwest Federation. <http://amfed.org/index.html>

The bulletins are published quarterly. You can find the news bulletins at <http://amfed.org/news/default.htm>



NFMS: The Northwest Federation is our home federation. To keep up on the goings on in our own backyard. <http://northwestfederation.org/>

The link for the news bulletins is <http://northwestfederation.org/Newsletters.asp>



ALAA: The American Lands Access Association, Inc. represents the rockhounding interests of 325 gem & mineral clubs/societies in 47 States and the District of Columbia.

The purpose of the association is to promote and ensure the rights of amateur fossil and mineral collecting, recreational prospecting and mining. The use of public and private lands for educational and recreational purposes. They also carry the voice of all amateur collectors and hobbyists to our elected officials, government regulators and public land managers. <http://amlands.org>



The front page also has a lot of current news, rockhounding restrictions or lack of, etc. <http://amlands.org>

ALAA also publishes a quarterly newsletter. To keep up on the news and lobby efforts on our behalf check out <http://amlands.org/>

Washington State Mineral Council: The Washington State Mineral Council is dedicated to the location and conservation of rock and mineral sites of interest to the rockhounds of Washington state. <https://mineralcouncil.wordpress.com/>

You can find a database of local rock and gems shows and field trips. It's a great resource if you want to plan on outing.

Also check out "Misc. News" for all the latest updates on collecting sites around Washington.

<https://mineralcouncil.wordpress.com/news-updates/>



When the weather is good they have regular monthly field trips. So take advantage of these great outdoor rockhounding adventures! The field trip details are under "Field Trips" on the left side of the site. Check out the link for additional details for time and place to meet and the field trip leader.

You can find all this information and a whole lot more about what is happening in our state at

<https://mineralcouncil.wordpress.com/>

Rockhounding Code of Ethics

I will respect both private and public property and will do no collecting on privately owned land without permission from the owner.

I will keep informed on all laws, regulations or rules governing collecting on public lands and will observe them.

I will, to the best of my ability, ascertain the boundary lines of property on which I plan to collect.

I will use no firearms or blasting material in collecting areas.

I will cause no willful damage to property of any kind such as fences, signs, buildings, etc.

I will leave all gates as found.

I will build fires only in designated or safe places and will be certain they are completely extinguished before leaving the area.

I will discard no burning material - matches, cigarettes, etc.

I will fill all excavation holes which may be dangerous to livestock.

I will not contaminate wells, creeks, or other water supplies.

I will cause no willful damage to collecting material and will take home only what I can reasonably use.

I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.

I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and will leave all collecting areas devoid of litter, regardless of how found.

I will cooperate with field-trip leaders and those in designated authority in all collecting areas.

I will report to my club or federation officers, Bureau of Land Management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.

I will appreciate and protect our heritage of natural resources.

I will observe the "Golden Rule", will use Good Outdoor Manners and will at all times conduct myself in a manner which will add to the stature and Public Image of Rockhounds everywhere.

from the AFMS website

To rub smooth the high points of a gold or silver article, use sodium bicarbonate with a minimum of water.

via Breccia, 2/21; via San Fernando Valley Mineral and Gem Society, 1975; from Del Air Bulletin

CMS Board Meeting Minutes September 7, 2021

by Pete Williams, 2021 Secretary

Attendance:

*President Kat Koch**Vice President Merriann Fu**Secretary Pete Williams**Past President Bob Pattie**Director Rich Russell**Director Roger Danneman**Federation Mike Blanton*

Meeting called to order 7:08

The Board approved making a \$50 donation to the Lake Washington Arboretum for allowing us to use their facilities for our August picnic.

We now have at least one candidate for almost all of the open club officer's positions.

There was one new member in August for a total of 87 families and 149 members

There are still some unfilled slots for our booth at Maple Valley Days in October and the Gem Faire in November. There will be a sign-up sheet available at the next meeting.

General meeting programs through January are set.

Now that the club is doing well financially, reimbursements for club members traveling on club business will be restarted. A motion was made, seconded and approved for mileage reimbursements at 14 cents/mile for the field trip leader, Mineral Council meetings and lunches, and Tumbler mailing costs. Also, included in the motion was partial reimbursement of \$400 for attendance at the NFMS meeting in Walla Walla this year. (Note: the in-person meeting was subsequently canceled due to COVID). Reimbursements for future NFMS meetings will be revisited next year.

Meeting adjourned at 7:57.

CMS General Meeting Minutes September 9, 2021

by Pete Williams, 2021 Secretary

Meeting called to order at 7:05. Minutes approved as written.

Only one more volunteer is needed to work the CMS booth at Maple Valley Days on Sunday October 10. Our club placed first in the NW Federation judging for best website thanks to Mark Hohn. Our newsletter editor, Keith Morgan, received 3 awards from the AFMS for the "Tumbler". Our club received 10 awards in total.

Our club is doing quite well now with 149 members. We continued to grow even during the pandemic while close to 60% of NW clubs failed. We are still looking for people to run for the Board. All positions are open except for 1 director slot. See the newsletter for details. A show chair is still needed. Green River College finally responded and we have the gym reserved for August 19-21, 2022 for our club show.

The NW Federation show in Walla Walla has been closed due to COVID. There will be a virtual meeting to vote on administrative items. Kat held a drawing for the 30 members who signed up for text reminders. The next drawing will be held when 50 members have signed up. Members can sign up by going to the website.

The program was Roger Danneman's presentation on his trip to Iceland to see the volcano.

Meeting adjourned at 8:07 followed by show and tell and the raffle.

From the Top of the Rock Pile... by Kat Koch, CMS President

I am so looking forward to Maple Valley Days at Lake Wilderness. It is going to be such a fun event. I still need 1 more volunteer for our club booth on Sunday morning, October 10th. Please contact me asap if you would like to volunteer.

The club still needs rocks for the spinning wheel at this event. Please let me know if you have some and I can arrange to pick them up.

Mike and I will also be selling at this event. If you should attend the Maple Valley Days, please stop by and say hello at the club booth or the Fancy Kat Rocks booth.

As some of you know, Mike and I went on a family cruise right after our club picnic in August. We stopped in Honduras, Mexico, and the Bahamas. My favorite stop was the Bahamas. My body came home as planned but it has been hard to get my mind back home. It was so good spending quality family time together plus visiting new countries. It is very interesting talking to people and learning about their country. We saw the Mayan ruins and I even zip-lined for the first time. I loved it!

I want to welcome each of you to our rock club. I apologize if I have missed introducing myself to you. Please feel free to come up and say hello.

**You Know that You Are a Rockhound if...**

You have found yourself trying to explain to airport security that a rock hammer really is not a weapon.

You think that the best rock music is the sound of rocks rotating in your rock tumbler.

from Breccia, 9/21

General Meeting – Thursday – October 14th, 2021, at 7 pm

The results from the survey I sent out a couple of months ago showed that you would like to have more "how-to" meetings.

So we will be showing 2 videos. The first video is on how to clean the saw oil off your slabs after cutting them.

The second video is on how to stabilize softer rocks to polish or cab them.

Show 'n Tell - lapidary item, polished rock or slab, cut gemstone, cabochon, intarsia, etc. that you have made.



New for Members Only – New Texting Service

You can now sign up for club text reminders for our upcoming meetings and events.

We are all busy and often forget CMS has an upcoming meeting or event.

To register for this reminder service, send a text to **(888) 731-1000**. In the body of the text, type the word **rocks**. Or scan the QR code with your smartphone, select "Send SMS," it will auto-insert the word rocks. Now hit send.

No matter how you register, you should receive a confirmation back that you are registered. If you do not receive a confirmation, try to register again.

So be sure to take advantage of this service. The only stipulation is that you must be a club member.

We had the drawing at our September meeting as we had reached our first goal of 30 registered members. Our winner was James Berg-Bradley. He selected polished Saddle Mountain petrified wood bookends.

There will be another prize drawing once we have registered 50 members. It is exclusively for text service registrants.

Okay members, we need only 20 more members to register for our next drawing. So hop to it and enroll in this reminder service. Register now and get in on the final drawing!

**Text
Reminder**



Our Club Needs Your Help

Our rock club is your rock club. The success of our club is built on our volunteers as we are a 100% volunteer organization.

A few volunteers can't do all the work as our club is steadily growing. Our club is fast becoming a large club. If you can't commit to one of the positions below, please consider volunteering whenever there is a call for help to cover a specific event.

Presently we need help in the following areas:

Upcoming Special Events

We have a club booth at the *Maple Valley Days, Lake Wilderness Park*. October 9th and 10th. I need 1 more volunteer to cover this event. We will have the spinning wheel for the kids to win free polished rocks. Also, tell people about our club and answer questions about our hobby. There will be literature to hand out and two display cases for viewing.

We need 1 more person to cover Sunday, October 10th, time slot 9:45 am to 1:30 pm.

It is the weekend before our next meeting. If you would like to volunteer, please call or text Kat at 425-765-5408 or email me at talkingkat2 at yahoo dot com and let me know.

We also have a club booth at the Gem Faire, Puyallup Fairgrounds. There are a few time slots left to be covered. We will have the spinning wheel for the kids to win free polished rocks. Also, tell people about our club and answer questions about our hobby. There will be literature to hand out and two display cases for viewing.



Friday, November 12th, we need 1 person from noon to 3:15 pm and 2 people from 3 pm to 6:15 pm.

Saturday, November 13th, we need 1 person from noon to 9:45 am to 2:15 pm.

Sunday, November 14th, we need 2 people from 9:45 am to 1:30 pm.

If you would like to volunteer, please call or text Kat at 425-765-5408 or email me at talkingkat2 at yahoo dot com

and let me know what time slot you are interested in.

Volunteer to be on our Board of Directors

Our entire Board, except for one position, is up for reelection this December. The term is for 2-years, 2022 and 2023. Nominations will be held in November 2021 and the election at our Holiday dinner in December 2021.

You can choose to nominate yourself for any Board position whether it's vacant or not. We must fill the vacant positions though as we have around 150 members with a wide variety of interests. We are seeking volunteers with new ideas on how to meet the needs of our members.



President

Vice President – Right-hand to President. You will help cover all the bases and conduct the meetings if the President is unable to. (vacant)

Treasurer – Keeps track of our income and expenses. Pays club bills and makes meeting venue reservations. Knowledge of simple bookkeeping. (vacant)

Secretary – Records our Board and general meetings. Submits a report each month to the Tumbler editor.

Gem and Mineral Show Chairman - Oversee the production of the show. (vacant)

Director 1 – Field Trip Guide

Director 2 – Helps where needed (vacant)

Director 4 (New Director 1 year fill-in position) – Program Director (vacant)

Volunteer positions that are voting members:

Federation Representatives - Reports on NFMS news and attends NFMS regional shows to votes on behalf of our club at the NFMS regional meetings and gem shows.

WA Mineral Council Representative - Attends WA Council meetings and reports back to the club.

Fall Colors, Bar Harbor, Maine



Colors From Around The World Series: Part 5 by Kat Koch, Cascade Mineralogical Society

Sea of Stars, Vaadhoo Island, Maldives

Among the tropical fish, sharks, and coral in the Maldives's Indian Ocean live billions of micro-organisms, including dinoflagellates, which are a type of phytoplankton. But what differentiates the *Lingulodinium polyedrum* from other

organisms is its unique ability to generate light. The movement of the sea and waves leads the plankton to emit light or bioluminescence. The bioluminescent light has an electric, blue-neon color, radiating further as each wave breaks. The speculator phenomenon is one of nature's rarest events. It's so remarkable, Hollywood decided to feature the Sea of Stars in Ang Lee's award-winning "Life of Pi" to illuminate the sea for the lost protagonist.

Although dinoflagellates have this blue glow, it doesn't mean that they're friendly at all. Some dinoflagellates produce toxins harmful to fish, humans, , and other creatures. The blue light is believed to be some sort of defense for these marine organisms. Predators that eat the glowing dinoflagellates may attract bigger predators because the phytoplankton can still glow even when inside another creature.

If you would like to view the waves against the beach in action click on this YouTube video <https://youtu.be/vOPliKfxk8Y>



Fairburn Agate, South Dakota, USA

The Fairburn Agate is found in the agate beds of Southwestern South Dakota and Northwestern Nebraska. It is also the state gemstone of South Dakota. Fairburn agates are different from other types of agates by their colors and the shape of the bands. They are composed of concentric layers of cryptocrystalline chalcedony colorized by different trace minerals. However, fortification banding distinguishes Fairburns from other agate types. Fortification banding means that the concentric layers have sharp changes in direction which cause the bands to form angles in ways that are especially distinguishable from other agate types. Mainly, no other agate type forms these patterns.

The genesis of Fairburn agates is debated and not fully understood; however, two theories are most accepted.

Theory 1: Fairburn formation takes place in sedimentary limestone, where calcite inside the limestone is replaced by silicon dioxide or silicic acid over time in a high-pressure, microporous environment. In this theory, bands of agate form from the inside of the agate outwards.

Theory 2: The agates are created over time by heat and pressure filling cavities in igneous rock with layers of silica. The first layer of silica lines the inside of the cavity and crystallizes. Then, during another geologic event, a different set of minerals and silica form on top of these layers, essentially forming the layers from the outside in, explaining why some agates have cavities in the center. These agates are incomplete and have not been filled with silica.



The Blue Lagoon, Galapagos Islands, Ecuador

The Galapagos Islands is an archipelago created approximately 8 millions of years ago from oceanic volcanic activity. It be found in the South Pacific Ocean 600 miles off the coast of Ecuador.

The Blue Lagoon is a remnant of a collapsed volcano. It is located off the south east coast of Santiago Island. On this very small island Rocas Baimbridgen the lagoon appears as a startlingly bright-blue eye, with a central lagoon. The stark, rocky island teems with life at times—the brackish lagoon waters are favored by flamingos.



Darvaza Gas Crater, Darvaza, Turkmenistan

The Darvaza Gas Crater, also known as the Door to Hell or Gates of Hell, is a natural gas field collapsed into a cavern near Darvaza, Turkmenistan. The crater is 225 feet wide and 99 feet deep. Accurate records of the how crater ignited have not been discovered, and some facts are disputed.

One story goes that in the late 1960s, Soviet scientists started drilling expecting to find oil. Instead they hit a huge underground natural gas cavern. They set it on fire to burn off noxious gases after the ground under a drilling rig gave way. Expecting dangerous releases of poisonous gases from the cavern



into nearby towns the engineers considered it advisable to burn the gas off. It was estimated that the gas would burn out within a few weeks, but it has instead continued to burn for 50 years and is expected to keep on burning.

The one fact that is not disputed is that the scientists vastly underestimated the amount of fuel that lay below—Turkmenistan has the sixth largest natural gas reserves in the world.

In November 2013, explorer and storm chaser George Kourounis, on an expedition funded partly by National Geographic, set out to be the first person to plumb the depths of the crater. His purpose was to gather samples of extremophile microorganisms.

Seven Coloured Earths, Chamarel, Mauritius

The Seven Coloured Earths are a geological formation and prominent tourist attraction found in the Chamarel plain of the Rivière Noire District in south-western Mauritius. It is a relatively small area (less than 2 acres) of sand dunes comprising seven distinct colors of sand (approximately red, brown, violet, green, blue, purple and yellow). Curiously the dunes are located within a dense forest.

The sands formed from the decomposition of volcanic rock (basalt) gullied into clay, further transformed into ferrallitic soil by total hydrolysis; the two main elements of the resulting soil, iron and aluminum, are responsible for red/anthracite and blue/purplish colors respectively. The different shades of color are believed to be a consequence of the molten volcanic rock cooling down at different rates, but the causes of their consistent spontaneous separation are yet to be fully understood.

Note: Ferrallitic soils are highly weathered and leached soils of the humid tropics enriched in iron and aluminum relative to silica. Primary minerals are generally absent except for quartz. In humid tropical areas, with consistently high temperatures and rainfall for all or most of the year, chemical weathering rapidly breaks down the rock. This at first produces clays which later also break down to form silica. The silica is removed by leaching and sesquioxides of iron and aluminum remain, giving the characteristic red color of many tropical soils.

Since the 1960s this has become a main tourist attraction now protected by a wooden fence. You can visit the area and view the sands from observation posts. Sunrise is the best time to view the dunes.

Bibliography: The Culture Trip, YouTube, When on Earth, Atlas Obscura, The Traveler, Charismatic Planet, Google Maps, National Geographic, Wikipedia, Trip Advisor, Science Direct, Mauritius Attractions.



The Grand Canyon of the Pacific by Kat Koch

We all know where the Grand Canyon is in Arizona but do you know that the U.S. has a second Grand Canyon?



Waimea Canyon, also known as the Grand Canyon of the Pacific, is a large canyon, approximately 16 miles long, up to 2 miles wide, and up to 3,600 feet deep, located on the western side of Kaua'i in Hawaii. Waimea is Hawaiian for "reddish water", a reference to the erosion of the canyon's red soil. The canyon was formed by a deep incision made by the Waimea River created by the extreme rainfall on the island's central peak, Mount Wai'ale'ale, among one the wettest places on earth. Wai'ale'ale is Hawaiian for "rippling water."

The canyon has a unique geologic history as it was formed not only by the steady process of erosion but also by a catastrophic collapse of the volcano that created Kaua'i.

Like the other Hawaiian islands, Kaua'i is the top of an enormous volcano rising from the ocean floor. With lava flows dated to about 5 million years ago, Kaua'i is the oldest of the large Hawaiian islands. Roughly 4 million years ago, while Kaua'i was still erupting almost continuously, a portion of the island collapsed. This collapse formed a depression which then filled with lava flows.



In the time since rainwater from the slopes of Mount Wai'ale'ale has eroded Waimea Canyon along one edge of the collapse. On the east side of the canyon, the cliff walls are built from thick lava flows that pooled in the depression.

Over time, the exposed basalt has weathered from its original black to bright red.

Precipitation at Mount Wai'ale'ale supplies numerous waterfalls (the largest of which is the 800-foot cascade of Waipo'o Falls, Hawaiian meaning "curved water"), sending down rushing streams on all sides to feed the only navigable rivers in the state.

Mount Wai'ale'ale with an elevation of 5,148 feet, is an eroded dome. It is part of a central mountain mass that includes Mount Ka-wai-kini, at an elevation of 5,243 feet, the island's highest peak, immediately to the south. Ka-wai-kini means "the multitudinous water." Wai'ale'ale is located at the southeastern edge of an extinct caldera that is now a plateau called Alaka'i Swamp. Shrouded in clouds, Wai'ale'ale is one of the world's wettest spots, averaging some 450 inches of rainfall annually. In 1982, 666 inches of rain were recorded on the peak, establishing an official record. Only a few miles away, however, the amount of precipitation drops dramatically to only 10 inches a year.

Bibliography: Britannica, Hawaiian Dictionary, Wikipedia

Living Fossil by Steve Mulqueen

A term applied to an organism that exists today and is also well represented in the fossil record. Living fossils have remained virtually unchanged in their anatomy and physiology over extended periods of geologic time to the present day.

During the winter of 1938, a coelacanth fish was caught by a fisherman off the coast of South Africa near the mouth of the Chalumna River (now called the Tyolomnqa River) within the Indian Ocean. The fish was thought to have been extinct for 70 million years until this chance encounter with a living specimen. These fish have been designated as one of many examples of a living fossil, because it is almost identical to specimens known to occur in the fossil record.

The phrase living fossil was first written in scientific literature by Charles Darwin in his 1859 book *On the Origin of Species*. His reference to the term was applied to organisms that resemble what he imagined to be examples of evolutionary transitions. He first labeled the term living fossil to two organisms, including the duck-billed platypus, which is a mammal that lays eggs much like a reptile, and a lungfish, that breathes with lungs much like a land animal.

Examples of Living Fossils

Animals: Aardvark, Alligator, Army ants, Cockroaches, Coelacanth, Crinoids (sea lily), Crocodile, Dragonflies, Horseshoe crab, Koala, Nautilus, Opossum, Platypus, Red panda, Salamanders, Sturgeon, Tuatara lizard, and Velvet worm.

Plants: Cycads, Ferns, Ginkgo trees, Metasequoia trees, Monkey puzzle trees (*Araucaria araucana*), and Wollemi pines.

Reference

See numerous listings on the Internet using the term living fossil. Also, look up some of the organisms by the names listed above for a more detailed description.

from Rockhound Rambling, 7/14

The Sands Of Mars by Jim Rienhardt

NASA at the Johnson Space Center (JSC) developed a simulated sand to resemble what is thought to be the upper layer of the planet Mars. This simulant is known as JSC MARS-1. The purpose was to permit rovers to be tested. Later it was tested for growing plants – remember the movie *The Martian*?

Unlike earth, the Mars soil, properly called regolith, has no organic material, so does not have the nutrients to grow plants. At least that is the hypothesis, but these things must be tested and it does contain a variety of inorganic minerals. Making a soil that exactly matches Mars is not possible as our knowledge of the planet's surface, while quite detailed, is not complete.

At first, material was taken from the Pu'u Nene volcanic cinder cone on Hawaii. This material has a spectral brightness similar to some regions on Mars. Based on Viking and Pathfinder missions it was found that the Martian "soil" contained 1 to 7% of magnetic material. The JSC stimulant contains a somewhat higher content of magnetic material. Viewing the JSC MARS-1 sample you first notice the reddish color. Under a microscope it looks like crushed scoria with bits of black basalt.

Since the development of the Mars simulant by JSC, there have been many more rovers on Mars and much better data. The main components of the Mars regolith are now understood to be mainly feldspar, pyroxene, olivine, and magnetite and it is very, very dry. In 2008 a better site for the raw material needed to create a Mars simulant was found at Saddleback Mountain in the Mojave Desert.

In 2016 the company Mars Garden was formed to make and distribute man-made Martian soil. The company adds chemicals to make the material as Mars-like as possible. They began selling Mars Garden kits for educators, and others, to experiment with growing plants in Mars-like soil. They quickly found that there was interest in samples of just the soil without the growing kit.

What is the surface regolith really like? The rovers drive through the dusty surface and dig into it, so we have an idea of the texture. The "sand" is very fine, like talcum powder. The astronauts who landed on the Moon said that the Moon was covered with much the same fine material, although, different composition. The reason that this material is so fine, both on Mars and the Moon, is most likely due to the continual and heavy bombardment of the surface by space rocks.

Chemical analysis from the Mars rovers has found sodium, potassium, chloride and magnesium in the "soil". There

is evidence that there may have been water on Mars at one time. Volcanic activity ended millions of years ago as did the heavy bombardment period. Without weather, plate tectonics, and volcanism, not much changes on the planet surface in modern times. However, there are dust storms. Minimally there are dust devils. More severely, there are global storms that blanket the planet for weeks. It is not easy to get the dust moving though Mars' thin atmosphere, but the winds on Mars can reach 60 mph. The dust is highly electrostatic and sticks to everything causing problems for rover solar panels. The Moon astronauts also complained that the dust stuck to everything.

Someday, perhaps in the not too distant future, a sample of the Mars sand will be brought back to Earth. Though hobbyists like us won't be getting our hands on any, there should be lots of pictures and analysis. Maybe years from now, one of your descendants will return from Mars and add a Mars sample to that collection that you painstakingly curated and handed down to them.

Sources:

https://spinoff.nasa.gov/Spinoff2018/cg_4.html

Dust in the Atmosphere of Mars 2017 (Lunar and Planetary Institute Contrib. No. 1966)

Martian Regolith Simulant JSC MARS-1, Johnson Space Center

<https://www.nasa.gov/feature/goddard/the-fact-andfiction-of-martian-dust-storms>

from the Sand Times, 10-12/20

The Challenge of Being a Rockhound on Mars by Jo Borucki

The study of rocks and soil has been one of the main sources of information, whether we are exploring the moon, an asteroid, or Mars, so essentially, every one of those missions has been partially a rockhounding mission. The most recent mission is the one where the latest rover is called Perseverance, and in this article, I am considering Perseverance to be our Mars rockhound. We can't send a person to do the work, because our level of technology is not yet advanced enough, so we send machines instead.

Being a rockhound on Earth, no matter where, is easier than being a rockhound on Mars. Here on earth, we wear appropriate clothing to shield us from the elements, and using just our hands and eyes for casual rockhounding and our tools for more serious efforts, search and collect desired materials. In the comfort of our homes, labs, and garages, we can work. We have an arsenal of ways that we can use to identify our samples. Sometimes we can just eyeball a sample, but often we will test for hardness, density, index of refraction, fluorescence, chemistry, and other properties using various methods readily at our disposal.

Being a Mars rockhound is much more challenging. Perseverance is well equipped to meet this challenge. It carries Mastcam-Z, SuperCam, MEDA, SHERLOC, PIXL, MOXIE, and RIMFAX, each with an important role.

Mastcam-Z has an advanced camera system that can get panoramic and stereoscopic images, and it can also zoom in on an object for a closer view. It helps assess the Mars surface and is the eyes for other rover operations.

SuperCam, as its name implies, is extra capable. It provides imaging, composition analysis, and mineralogy. It can detect the presence of organic compounds from a distance, an important function as we try to determine if there is life of any kind on Mars.

MEDA is essentially the weather station. It measures temperature, wind speed and direction, pressure, relative humidity, and dust size and shape. The weather station that Bill and I have on our roof does all this except the dust size and shape which I interpret as pollen. My nose takes care of that function. Achoo!

SHERLOC is a spectrometer. It provides spectra to identify atomic composition and uses an ultraviolet (UV) laser for fine scale mineralogy and to detect organic compounds.

PIXL has an X-ray fluorescent spectrometer with a high-resolution camera to measure the fine scale elemental composition of the Mars surface.

MOXIE is an experiment to produce oxygen from the Martian atmosphere's carbon dioxide. We hope that someday, in the future, we can produce enough breathable air so that humans can survive on Mars.

RIMFAX uses radar to penetrate the Martian surface to provide centimeter-scale resolution of the geographic structures of the sub-surface.

One of the early findings of Perseverance is a rather lovely blue-green rock in the Jezero Crater. The rock is six inches long, and has scientists wondering about its composition. Perhaps it weathered out of the existing landscape or possibly, it could be a meteorite.

There is much to be learned, and the hope was that the Ingenuity helicopter that is also a part of the mission will be able to fly in the scant Martian atmosphere which is only 6% of the density of the earth's atmosphere. Planes and birds fly because the difference between the lower density on top of a wing as compared with the higher pressure under the wing allows the wing to be pushed up. The difference in pressure provides lift for the aircraft. On April 19, 2020, the helicopter design proved successful, and Ingenuity flew! In the future it will fly to the surrounding cliffs and take samples of the composition of the cliff materials.

Perseverance is the rockhound for Mars. It is a capable rockhound, and it will be interesting in the months and perhaps, years to come, to see what it finds on Mars. Perseverance looks toward the future, in that it will gather rock and soil samples, and it will cache these samples for a pickup in a future mission that will bring them back to earth. Current technology does not allow samples to be returned to earth, but both NASA and the European Space Agency are working on ways to do this in the future, and then like any rockhound, our desire to bring our cache of rocks home will become a reality.

Once when I was walking at Shoreline with a friend, I found a piece of Malachite. I was astounded, because as far

as I knew, there was none at the park, so I took it home, and Bill and I ran various tests, and sure enough, it was Malachite. The Malachite was probably dropped there by a visitor or brought in with the gravel used to pave the trails. We don't have previous knowledge of the composition of the Martian soil and rocks, and it is important that when the samples taken and stored are tested, that the mission has a way to weed out contaminants so they know that the materials gathered are those native to Mars. The landing pro-pulsion system and any contaminants inadvertently brought from Earth must be taken into account. This is done with Witness tubes. The tubes contain materials that can capture such contaminants and store them for later comparison with the Mars sample that have been collected.

So what is a rockhound? The dictionary defines such a person as a geologist or amateur collector of mineral specimens. We rockhounds collect for many reasons; financial, pleasure, knowledge, and often just for fun. Perseverance goes before us, but someday we may go to Mars to do our own rockhounding.

Information sources for this article:

<https://www.geochemsoc.org/publications/geochemicalnews/gn144sep10/ahistoricalperspectiveofth>

<https://mars.nasa.gov> has information, not only on Perseverance, but the previous mission called Curiosity, and it provides updates on the Mars missions and what they measure and have learned.

<https://www.nature.com> has a great variety of articles including ones on the Mars Missions.

from Breccia, 5/21

Preserved Pleistocene Cave Lion Cubs From the Siberian Arctic by Steve Mulqueen

Several years of global warming have caused melting of glacial ice, tundra and many other ice accumulations that date back to the Pleistocene Epoch. As these frozen features melt and sublimate*, they often expose plant and animal fossils. A fantastic opportunity for the discovery of Pleistocene vertebrate fossils has arisen from this warming trend. This article describes the discovery of two near-perfect frozen cave lion cubs in the Siberian Arctic during 2017 and 2018. The cubs were exposed on the melting edge of the tundra in Russia's Yakutia region, along the banks of the Semyuelyakh River.

The term tundra is defined as a region in arctic or subarctic climatic zones consisting of a planar geomorphic feature containing black, mucky, water-saturated surface soil with permanently frozen subsoil. Surface soils may remain frozen several months of the year and will melt and turn into a marshy surface during the warmer months. Tundra subsoil contains an abundance of ice, representing a groundwater-saturated feature that became frozen thousands of years ago.

Tundra regions are often treeless or contain evergreen trees that commonly exhibit stunted growth. Dominant vegetation in tundra may include dwarf shrubs, herbal plants, lichens, and mosses, with or without dwarf evergreen trees. Tundra may also occur in mountainous regions above the timberline.

One of the two Pleistocene fossil cave lion cubs is a female, subsequently named Sparta. She was found by Russian mammoth ivory hunters during the year 2018. Sparta is a very well-preserved, mummified (freeze-dried) cub. Carbon-14 isotope age-dating methods indicate that she died approximately 28,000 years ago. The specimen exhibits fur, whiskers and has all organs intact, although the carcass is slightly deformed by the overlying weight and slow movement of the recrystallizing tundra ice. Sparta is believed to be the best-preserved Ice Age mammal ever discovered. Scientists have determined she was one to two months old when she died and became frozen during the Pleistocene Epoch.

A male cave lion cub that was subsequently named Boris. He was found during 2017 by mammoth ivory hunters. Sparta was later discovered in 2018, only 15 meters away from this 2017 discovery site. Boris has been age dated and found to be 43,448 years old, with some calculated inaccuracy to the 14C age dating method. He is also a very young well preserved mummified cub that exhibits fur, whiskers and complete anatomy and physiology. This cub was also about one to two months old when it died.

Both cave lion cubs are thought to have died and became preserved during and after a mudslide event or by falling into a crevasse in the deep permafrost. Both specimens were buried quickly, frozen almost immediately and remained frozen since the Pleistocene Epoch. Fossil evidence shows that the cave lion species such as Sparta and Boris went extinct near the end of the Ice Age.

Pleistocene mammal fossils from frozen tundra often contain DNA that can be isolated, sequenced, and recorded for science. Fossils such as Sparta and Boris may contain the remains of milk in their stomachs that originated from their lactating mothers. The chemistry of milk in the stomachs of each lion cub may be important for identifying their mothers' diets. The dissection of each cub will disclose details of their internal anatomy and physiology.

The stories of Sparta and Boris are just a few examples of the fantastic discoveries of vertebrate fossils that have been found on the edges of melting tundra throughout the world. The Siberian Arctic, along the banks of the Semyuelyakh River in Russia's Yakutia region, represents one of the most prolific areas for the discovery of well-preserved Pleistocene age mammal fossils.

Reference

*Sublimate: Another term for sublime, the ability of ice and some other solids to change phase from a solid into a vapor without the intermediate process of melting or liquefying.

Source: The Journal of Quaternary Science. Conduct Internet searches under the titles of: Pleistocene cave lion cubs, Siberian tundra, Pleistocene fossils of Russia's Yakutia region and Semyuelyakh River mammal fossils.

from Rockhound Rambling, 9/21

Tenebrescence is an older term referring to minerals reversing colors when exposed to lights of different wavelengths. Photochromism is a newer term replacing tenebrescence.

Young Tumblers News

Carats, Carets, Karats, Carrots... Oh, My! by Pat Speece

Confusing!
This might help.
Fill in the blanks.

- 1- The five _____ (carat, caret, karat) stone produced a tender blister on his foot where he hid the valuable carbon stone in his shoe.
- 2- It takes a long time for a king size 14 (carat, caret, karat) gold ring to become dull.
- 3- What is this called ^? Some of us use it a lot.
- 4- Extra Credit: Bugs Bunny would rather munch on _____ (carrats, karets, carrots, turnips).

Answers

- 1- Carat (ct) is a unit of weight of precious stones and pearls. It is 200 milligrams (1oz=28,349.523 mg). Carat weight is important when buying or selling gemstones; color, clarity and cut also help to determine monetary value. HINT: carat/carbon
- 2- Karat (KT or kt) is a measure of fineness of gold. A gold karat is 1/24th part, or 4.1667 percent of the whole. The purity of a gold alloy is expressed as the number of the parts of gold it contains. An object that contains 16 parts gold and 8 parts alloying metal is 16 karat gold. Pure gold is 24 karat gold. HINT: king/karat (Outside the United States, it is spelled carat.)
- 3- Caret is a proof-reading symbol. It looks like an upside-down V. Some cultures use the V version. English uses the point up version ^. The ^ symbol is on the 6 on the keyboard. If you left some-thing out, you could always insert a ^, and add the missing idea above it, or below it if you use the V version. HINT: Writers care about forgotten words. Hurrah for carets!
- 4- Carrot This root vegetable is a Bugs Bunny favorite.
As a rockhound or jeweler, you need carat and karat.
As a writer, you use caret. ^
As Bugs Bunny, you need carrot.
That's all, folks!

from Breccia, 3/21

What's In A Gemstone Name?

- Chatoyancy* - From the French chatoyer, meaning to change color, caused by a reflection of light from countless inclusions of hairlike fibers of another material. Example - tiger eye.
- Asterism* - A special type of chatoyancy resulting when several sets of inclusions cross, giving rise to a separate streak of light for each. Example - 3 sets of inclusions form a 6 - legged star as in a star sapphire.
- Aventurecence* - Reflections of light from numerous small wafer-like inclusions of foreign materials that act like tiny mirrors. Example - fuchsite, aventurine.
- Schiller* - Similar to aventurecence, however it is not caused by inclusions, but by numerous flat separations along cleavage planes which reflect a silvery light in certain positions. Example - feldspar, sunstone.
- Transparency* - The ability of a mineral to transmit light, and through which objects can clearly be seen. Example - mica.
- Translucency* - The mineral transmits light, but only a dim outline of an object shows through. Example - thin slabs of jade.
- Opacity* - If no light is transmitted even on thin edges of the mineral, it is said to be opaque. Most metallic minerals are opaque. Example - graphite.

via Breccia, 8/21; via Gritty Greetings; from The Rock Rattler, circa 1960s

Book Report: A Guide to Fossils by Helmut Mayr by Susan Satchwill, Three Rivers GMS librarian

Anyone interested in collecting fossils or in learning more about the previous life of these animals and plants will find a wealth of information in this lavishly illustrated guide. Intended to aid amateurs in specimen identification and classification, this book offers an encyclopedic breadth of coverage. Mayr discusses the origins of fossils and the forms of their preservation, tips on collecting and on recovery and storing, technical terminology, and insights into scientific research. The main section contains over 500 illustrations and descriptions of fossils, with an emphasis on ammonites, but also includes corals, mollusks, snails, echinoderms and brachiopods, vertebrates, and plants. Each illustration's description includes distinguishing marks, geographical distribution, period of existence, and the habits and ecology of the individual genera.

Guide available from Better World Books.com in digital or paper format.

via A.F.M.S. Newsletter, 10/21; from The Strata Data, 9/21

AFMS Juniors Mascot and Oath Contests

The American Federation of Mineralogical Societies Future Rockhounds of America announces two new contests. One is for an official mascot to represent kids enrolled in the AFMS/FRA program. The other is for an oath that newly enrolling kids would take. Winners of each contest will earn \$100 and a Certificate-of-Achievement from AFMS and will have their accomplishments posted to the AFMS website. Kids participating in these contests must be members of local clubs or societies holding an affiliation with AFMS via one of the seven regional federations. Please note that both the winning Mascot and Oath will become full and complete property of AFMS in perpetuity.

AFMS Juniors Mascot Contest.

The Bald Eagle has long represented the United States of America. Smokey Bear is an icon of the U.S. Forest Service. "Mr. Peanut" has represented the Planters Peanut brand for over 100 years. The Walt Disney Company is instantly known by Mickey and Minnie Mouse.

Can you suggest a mascot to represent the AFMS Future Rockhounds of America kids programs? How would you, yourself, like to be represented? By a "Rockhound puppy"? By a "Mr. or Ms. Crystal"? By "Dinny the Dinosaur" or some other fossil? By something else altogether?? Send your suggestion along with an original design. Who knows? Perhaps that design will be represented on the AFMS/FRA website and on a badge issued to all kids participating in the program in years to come! If you would like to enter this contest, here are the rules:

Come up with a suggested mascot and explain the reason behind your suggestion in a cover letter. That letter also should include your name, age, the rock club you belong to, and the name of the leader of your juniors group and/or club. Also include full contact information of your parents or legal guardians: name/s, address, phone, email address.

Prepare and send a design in color on letter-size paper (8.5 X 11 inches) illustrating your mascot. You can use pencil, pen, crayons, markers, or computer-generated art. Be sure not to include any copyrighted images in your design.

A parent or legal guardian must sign the drawing on the back and state whether they will allow you to have your full name disclosed in the AFMS newsletter and website or just a first name in the event that your design is chosen.

Send a letter explaining your mascot, along with your design, to Jim Brace-Thompson, 7319 Eisenhower Street, Ventura, CA 93003. Alternatively, you may email both your letter and a pdf of your design to Jim at jbraceth@roadrunner.com, along with a scan of the parental approval statement and signature.

Please note that once the winning design is accepted, it may be modified for badge manufacturing or other publishing or processing specifications.

AFMS Juniors Oath Contest.

Many countries, associations, organizations, and other groups ask folks to make a pledge when becoming a member. For instance, immigrants to the United States are asked to devote themselves to their new country and to take the Pledge of Allegiance. Kids joining Boy Scouts of America are asked to take the following oath and promise: "On my honor, I will do my best to do my duty to God and my country and to obey the Scout Law; to help other people at all times; to keep myself physically strong, mentally awake and morally straight." Even U.S. Presidents are required to take the Oath of Office: "I do solemnly swear that I will faithfully execute the Office of President of the United States, and will to the best of my ability, preserve, protect and defend the Constitution of the United States."

In 50 words or less, what do you suggest as an oath or pledge for kids joining the AFMS/FRA program? If you would like to enter this contest, here are the rules:

Prepare an oath consisting of 50 words or less.

Include a cover letter telling why you think this oath is appropriate. That letter also should include your name, age, the rock club you belong to, and the name of the leader of your juniors group and/or club. Also include full contact information of your parents or legal guardians: name/s, address, phone, email address.

A parent or legal guardian must sign on the back the paper containing your oath and state whether they will allow you to have your full name disclosed in the AFMS newsletter and website or just a first name in the event that your oath is chosen.

Send your suggested oath and cover letter to Jim Brace Thompson, 7319 Eisenhower Street, Ventura, CA 93003 or email your oath and letter to jbraceth@roadrunner.com along with a scan of the parental approval statement and signature.

Please note that the winning oath may be modified; for instance, for length, grammatical, or other considerations.

Deadline.

The deadline for both the Mascot contest and the Oath contest were originally December 1, 2021, but we have extended this to May 1, 2022 to allow more time for more participants. Winners will be announced at the very next AFMS Show & Convention, currently scheduled for October 22, 2022 in New Orleans. Here's hoping to see your suggested mascot and oath! Best wishes to all entrants!

from A.F.M.S. Newsletter, 9/21

Erratic: A rock of unspecified shape and size, transported a significant distance from its origin by a glacier or iceberg and deposited by melting of the ice.

from USGS Twitter, 8/26/21

Field Trips

The club or clubs sponsoring the field trips are shown in italics. When known I have listed a phone number and contact person for each sponsoring club below the listed trips. If you are not a member of the sponsoring club, you should phone and ask permission to go on their field trip.

Information from the Washington State Mineral Council webpage (<https://mineralcouncil.wordpress.com>).

October 16 *Cascade Mineralogical Society* - Field Trip to **Red Top** for agate/jasper/geodes
Roger Danneman roger.danneman@gmail.com; 425-228-8781 hm or 425-757-3506 cell.

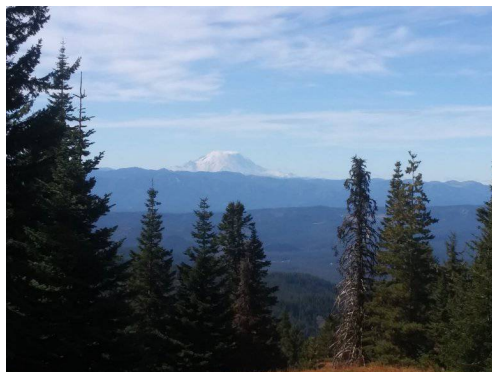
October 24 *Marysville Rock Club* - **Money Creek Skykomish** – Meet at Money Creek Campground before 9 am -
Picture Jasper - Bring digging & R. Bar pick
Ed Lehman wsmced@hotmail.com h# (425) 334-6282 c# (425) 760-2786

September Field Trip Report by Roger Danneman, Field Trip Guide (roger.danneman@gmail.com)

It was a very beautiful day up in the mountains for this trip. The smoky air was scrubbed out thanks to the previous day's rain and the mountain range was clear and gorgeous. Mt. Rainier could be clearly seen from the Red Top Meadow. We had 22 people in 12 vehicles and ended up in 3 groups. One group of 9 started at the lower dig site up the steep hill from the road. One group of 7 took the 1/2 mile hike up to the meadow and dug up there for about 2 1/2 hours before returning to the lower dig site. And one group of 6 went to the main parking area and worked around the main dig sites near the top, eventually working their way down to the Meadow where I was digging. The clay soil was pretty hard and dusty. But there were some nice payoffs. Tim and Kelly scored some nice sized geodes. I found a few nice agate nodules in the Meadow dig and some very nice agate and jasper in the lower dig site.

Our next field trip is scheduled for Oct. 16. My plan is to go to Red Top again, but that could change if I get some feedback from field trippers that want to go to a different spot. Details will be e-mailed to Field Trip Distribution List on Oct. 9th.

The Nov. field trip will be to First Creek which is a 2 mile hike.



Young Richard's Almanac by Dick Morgan

As we enter another fall season and worry about sniffles, school children, and spooks at the end of October. Sniffles can be helped with chicken noodle soup, help your children with their school work (but don't do it for them), and have candy for the spooks.

'Tis the season of earlier darkness and later sunrises causing drivers to use extra caution when driving to and from work.

Shows



October 1 - 3: Friday & Saturday 10 am – 6 pm; Sunday 10 am—5 pm
Portland Regional Gem and Mineral Show, 41st Annual Show
Wingspan Event Building
801 NE 34th Avenue
Hillsboro Oregon



Internet Addresses

Your Dinosaurs Are Wrong YouTube Channel
The host points out errors in dinosaur toys (mostly) based on the latest evidence at the time of filming.
<https://www.youtube.com/c/YourDinosaursAreWrong>

How a Mass Extinction Created the Amazon
<https://www.youtube.com/watch?v=Stv-a96foIE>

How Ancient Human Clues Ended Up In Rock
<https://www.youtube.com/watch?v=xx6M0so1yvl>

Blue John Fluorite by Kathy Reimers

Dave and I recently watched a very interesting show on the Science Channel. It was a short piece on Blue John Fluorite and the cavern it is mined from. It was an episode of "Underground Marvels" (Season 1, Episode 7. Wow—I was soooo impressed with the beauty of the fluorite and the cavern that it comes from. It is mined from Treak Cliff Cavern in Derbyshire County, England (Castleton). It is believed the cavern was formed and, later, mineralized by water rising vs descending "hypogenic speleogenesis".

The cavern was discovered by accident by miners looking for lead in the mid-18th century. It has never been mined on a large scale. It has been mined by hand by the "plug and feather" method. Two miners worked together. One miner held a chisel-like bar in place and another miner, standing behind, would whack the bar's end. Wow, such trust! They recently (2015) started using a stone chainsaw to aid in the mining operation. Less than one ton of this mineral is mined every year. It is so beautiful! I would recommend watching this episode if you get the chance.

from The Hard Rock News, 9/21

Eye Am Your Best Friend by Les Van Wormer

Have you ever thought, as you pounded and hammered on a big hard specimen, just how you would get it in your car and drive home and work it up if you could not see? Most of you know the hardness of most stones we are chipping, whether it is hacky or splintery fracture. But does this make us respect the danger this represent?

Many rockhounds have been slapped in the face by branches and leaves. This can cause eye injury, but there are many other ways that you may gamble with your eyesight if your eyes are not protected. For example, silicon carbide particles fly off a grinding wheel, a sanding belt breaks at 1750 revolutions per minute, a Vee belt splits, or a cab flies off of a dop stick. Please protect your eyes and wear gog-gles or safety glasses when you grind or polish rocks.

via Breccia, 9/21; from ? 1972

