



THE CMS TUMBLER

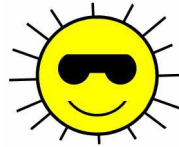
**June
2020**

**Next Meeting:
Canceled.**

The sun isn't trying to
give you a bad sunburn!



But give it a
chance and it will!



Connect with us!

Website: cascademineralsociety.org

Club Facebook: facebook.com/CasMinSoc/

Show Facebook: facebook.com/cascadegemandmineralshow

Instagram: instagram.com/cascadegemandmineralshow/

This month remember
to wish a
Happy Birthday to
Michelle Patterson on June 2
Kathryn 'Caly' Jellum on June 4
Cheyenne Sorkness on June 5
Leonard Bahr on June 7
Bridget Black on June 9
Charles Benedict on June 10
Ronald Buzzard on June 10
Isaac Fu on June 11
Michael Watson on June 11
Shelley Opel on June 16
Isabel Viejo on June 19
Becky Patterson on June 21
Timothy Shao on June 22
Joyce Gjerde on June 23
Carolyn Mackey on June 24
Margaret Squires on June 27
Brenda Haworth on June 29
Dick Morgan on June 29
Lloyd "JR" Ruegg on June 29
and also remember
to wish a
Happy Anniversary to
Robert & Mrs. Waddell on June 8 (6 years)

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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.

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

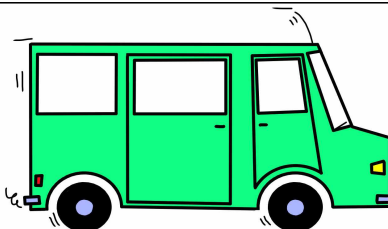
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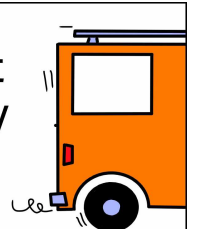
Postal, or Email, Exchange
Bulletins are welcome.
Email preferred.
greenrockdraggin@yahoo.com



Practice social
distancing on
rock trips!



Keep your car at
least 6 feet away
from other cars!



2020 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
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Director	Roger Pullen	206-387-3214	None
Director	Roger Danneman	425-228-8781	roger.danneman@q.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
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2020 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
Cascade Show	Silent Auction	Michael Blanton	425-271-8757
Cascade Show	Raffle Donations	Michael Blanton	425-271-8757
Cascade Show	Demonstrators	Richard Russell	253-736-3693

2020 Committee Chairs

Club Historian			
Donations	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
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Public Relations	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
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Raffle/Display	Roger Pullen	206-387-3214	None
Shop Operations	Bob Pattie	425-226-3154	bobpattie@comcast.net
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Social Media	Kat Koch	425-765-5408	president@cascademineralogicalsociety.org
Webmaster	Mark Hohn	253-332-3736	showchair@cascademineralogicalsociety.org

2020 CMS Dues are \$25 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

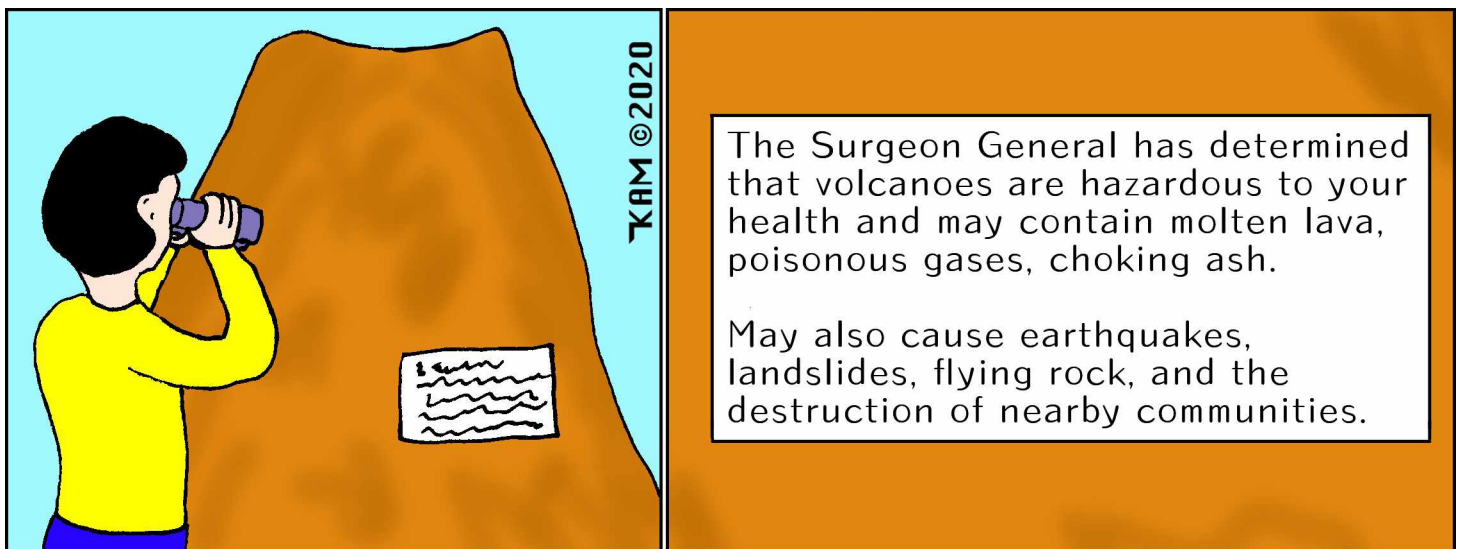
To get information to the Tumbler via the Internet send it to greenrockdraggin@yahoo.com Please put Tumbler and subject in the Subject Line. The deadline is the 20th of each month.

Sun	Mon	Tue	Wed	Thur	Fri	Sat
 1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	Meeting Canceled			

CMS Show Committee Meeting:....Canceled
 CMS Board Meeting:.....Canceled
 CMS General Meeting:.....Canceled

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 11
 More Show info can be found on Page 12



CMS Board Meeting Minutes May 11, 2020

Canceled.

CMS General Meeting Minutes May 14, 2020

Canceled.

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

I guess the biggest news since last May's news bulletin is our Board voted to cancel our Gem Show in September.

The Board has already reserved the dates for our show next year, September 17-19, 2021. By then we should all know the changes that will be required to put on a public event. A gem show is unique as a good portion of our vendors, visitors and volunteers fall into the high risk range for this virus. We will have to be fully cognizant of this fact when planning our future shows.

Looking at Governor Inslee's plan for reopening Washington we can not have a June meeting. Please check our CMS website often for the status on being able to resume meetings.

Our monthly field trips are continuing. Families or individuals that have quarantined together can carpool together. All others must travel individually. When searching for material families can search together but individuals must maintain a distance of 6 ft from each other.

Diamond Dan has given us permission to post or distribute May's Mini Miner's Monthly, a publication for young rock hounds. Please go to our website and download your copy. It has a lot of good activities for our Young Tumblers. It will help entertain all your bored children.

Looking forward to the day when we can resume our meetings as all need to "talk rock" with our club friends!



Young Richard's Almanac by Dick Morgan

Everyone talks about having a Guardian Angel, but when some thing good happens to you it may not be an unknown angel but a friend or relative that thinks you are worth helping, so this is a grand Thank You to all those help out in these trying times,

Rockhounding While Sheltering in Place by Jo Borucki

During these times of sheltering in place, it is not so easy to look for rocks and minerals at your favorite rockhounding site, but you can have the rocks come to you.

Purchasing Gravel from Sapphire Mines: There are several online sites in Montana that sell bags of material scooped from their mines and bagged. Gem Mountain is the one that I have ordered from, but there are others such as Spokane Bar or huntforgems.com. I can't vouch for either of these two, but I have enjoyed finding small sapphires in abundance from the Gem Mountain website. The fun is in the looking through the gravel, but unless you are luckier than I am, you will not find many, if any, that are large enough to facet. Searching this gravel is simply an enjoyable treasure hunt with the thrill of finding some sapphires.

Cleaning the Gravel: The bags contain dirt, extraneous rocks and pebbles of varying size, some dried vegetation, and hopefully, sapphires. Begin the process of sorting through the gravel by cleaning out as much of the debris as you can. Use screens with a variety of mesh sizes. Stack them with the screen with the smallest mesh on the bottom and getting ever larger mesh with the screen with the largest mesh on top. Dump some of the gravel in the top screen. Pick out the obvious rocks and debris and spray and shake it over the other screens so that nothing escapes. Now that the large screen has been sprayed and all the little stuff has gone through to be caught by smaller screens, look it through, and spray it with a good strong hose stream. Put the whole assembly over a bucket and and spray and shake the screens side to side. Be an optimist and check each screen from the one with the largest holes on down. Who knows? Maybe you'll find a really big sapphire.

Searching the Cleaned Gravel for Sapphires: Sapphire really show up beautifully when the gravel is cleaned, placed in a glass dish with a little water in the dish, and the dish is placed over a light source. My husband, Bill, has this really nice frame that he built that has a light bulb in it. He uses it to light the his microscope, but it works great for lighting up the bottom of my Pyrex baking dish so that I can search for sapphires.
from Breccia, 5/20

3,600 years ago Mt. St. Helens had an eruption four times larger than the May 18, 1980 eruption.

Monster Nugget Found In 1869 Would Sell For \$12 Million Today! by Kat Koch

Over the years many myths have been told about how the world's biggest alluvial gold nugget, named the "Welcome Stranger," was found in 1869, in central Victoria, Australia.

One was that its finders, Cornish miners John Deason and Richard Oates, tripped on it while staggering home from the pub to their bush shacks at Moliagul, 37 miles west of Bendigo.

Or that their horse-drawn jig broke an axle by running over the whopper: it was 24 inches long and its gold weight was 158.7 lbs.

But the real story was almost as unbelievable. At about 9 am on February 5, 1869 Deason, a seasoned gold fields digger, was picking at the base of a tree on a slope leading to what was then known as Bulldog Gully.

His pick hit what he thought was a rock just a few inches from the surface, and the pick's handle broke, but on closer inspection, Deason realized it was a large mass of gold. Using a crowbar, Deason pried out the nugget, which was embedded in quartz.

After breaking off pieces of gold for family and friends, the pair hid the nugget in a calico bag and took it the 12.5 miles to London Chartered Bank in Dunolly. The nugget had a gross weight of 241 lbs 10 oz, akin to an adult male. The trim weight was 192 lbs 11.5 oz.

They were paid 9563 Australian pounds. The nugget was melted down into gold bars. No photo of it was taken, however, replicas were made, based on sketches.

The thrilling news of the "monster nugget" as The Argus newspaper called it, reverberated across the world.

The newspaper article dated February 11, 1869, said the nugget "beats anything ever found before in any part of the world ... great excitement exists all round Dunolly, and people are arriving from all parts to see the nugget".

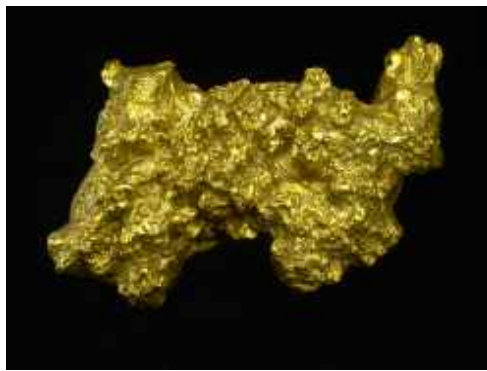
On February 5, 2019 the 150th anniversary of the lucky find was celebrated at the historical marker, 1.25 miles southwest of Moliagul in central Victoria.

Searching Ancestry, Miner John Deason was born in 1829 on the island of Tresco, The Isles of Scilly, 28 miles southwest of Cornwall, England. He migrated to Australia in 1851 and was a tin dresser before becoming a gold miner.

Deason continued with gold mining and workings most of his life and, although he became a store keeper at Moliagul, he lost a substantial proportion of his wealth through poor investments in gold mining. He bought a small farm near Moliagul where he lived until he died in 1915, aged 85 years.

Miner Richard Oates was born about 1827 at Pendeen in Cornwall, England. After the 1869, according to Ancestry, Oates returned to the UK and married. He then returned to Australia with his wife and they had four children. The Oates family, in 1895, purchased 800 acres of land at Marong, Victoria, Australia 15 miles west of Bendigo, Victoria. Mr. Oates farmed until his death in Marong in 1906, aged 79 years.

Sources: The Age, Wikipedia, Victoria Museum, State Library of Victoria, Ancestry



Do You Know What This Is? by Kat Koch

Is this a Rainbow?

Answer: A rainbow is a rainbow. This phenomenon doesn't have a specific name. The cause is refraction/dispersion of light due to water in the air. It's raining over there. The shape is just a matter of angles and height.



This chunk of resin is numbered and has a heavy weight inside. It was found on a beach. What is it?

Answer: These "tracker pebbles" are buried along coastlines to track long shore drift. After a planned period of time, metal detectors are used to track where they've traveled with the tides.



What is was found in Deep Creek, Maryland. What is it?

Answer: Fossilized Stonefly larvae. Stoneflies are a good sign of of water quality.



This strange rock was found in an oil mine. What is it?

Answer: Fossilized coral from an ancient coral reef.



Found along the shore of fresh water lake in Texas. What is it?

Answer: It's a fossilized freshwater drum fish's mouth. This fish is known for having "throat teeth."



Blue Water Lagoon in Myanmar. What makes the water so blue?

Answer: The water gets that color from a nearby limestone cave, which leaches calcium carbonate into the water.



Sources: Dibly, Reddit, Bored Panda, Wikipedia

Sunburn: "Be Aware" by Chris Robinson

Sunburn is caused by an excessive exposure to ultraviolet radiation. Hence the ultraviolet is known as UV. In the case of the types of UV "C" is the most destructive to the Epidermis skin because it is the top layer of the skin. It is followed by "B" which is the middle Layer of the skin. And, "A" is the dermis layer of skin.

There are 3 types of UV radiation: UVA, UVB and UVC. The first is the UVA ray which penetrates all the way to the inner layer of the skin or dermis. This causes premature aging of the skin and in some cases sun allergies. The UVB ray tans the skin, however it causes irreparable skin damage and increases the likelihood of skin cancer. The third UVC ray is the most harmful because it directly affects the Epidermis layer of skin the most exposed to the ultraviolet radiation. There are 3 types of burns: 1st degree burns consist of extremely red, swollen skin while 2nd degree burns consist of blistering on the epidermis layer of skin. 3rd degree burns are the worst because the damage is so severe it leaves scarring after the burn has healed. The face and head are the most affected areas. Sunburn can produce nausea and circulatory problems as well. Be aware of the medications you take. Some medications make you more sensitive to the sun. Watch for the signs:

Heat Cramps are the first signal the body is having trouble with the heat. The first signs of heat cramps are painful muscle cramps which usually occur in the legs and abdomen.

Heat Exhaustion is the second signal which is more severe than heat cramps. The symptoms are cool, moist, pale or flushed skin, headache, nausea, dizziness, weakness and exhaustion. Heat Stroke is the most severe. This occurs when people ignore the signals of heat exhaustion.

Heat stroke is a very serious medical emergency! The signals to watch for are red, hot dry skin (no sweating when

sweating should be present),: changes in consciousness, rapid, rapid shallow breathing and weak pulse. Call for help immediately.

Caring for Heat Related illness:

- Get the victim out of the heat, place in a cool place out of direct sunlight. Remove unnecessary clothing and place victim on his/her side to expose as much skin surface to the air as possible.
- Apply cool water by sponging or spraying water on the person, but not cold water.
- Fan the victim.
- Watch for breathing changes.
- If victim is conscious, give cool water or Gatorade to drink (about 4 oz every 15 minutes).
- If necessary, cold packs can be placed on the wrists, ankles, groin area, armpits and neck to cool the major vessels.

Things NOT to do for victims of Heat Related illness:

Do not give salt tablets or salt water to the victim.

Do not use rubbing alcohol on the victim.

Do not immerse the person in an ice bath.

Do not give aspirin or acetaminophen to the victim.

In extreme cases, call 911.

via Golden Spike News, 6/18; via Rock Buster News, 6/14 & 6/18; from T-Town Rockhound, 7/05

Apache Tears by Michele Smith

When I was a little girl, maybe eight years old, my family went to the Apache Tears just south of Superior, Arizona on the way to Miami, Arizona. As you drove down the highway and looked very carefully, you would see a small metal sign, rusted, about four feet off the ground right at the road entrance that said 'Apache Tears'. If you knew where it was, you started slowing down, making all the cars behind you irritated, and then you turned abruptly onto the narrow dirt road. I don't think there was any road sign, but if you followed the road there was an area you could park in to the right and get out and find small obsidian rocks, only needing a fine grit polish and a final shine tumble to finish them up. I actually liked the chunks of obsidian that were wrapped with perlite and where the obsidian peeked through the white outer cover. These were just lying on the ground, easy to pick up and put in a pocket or small bucket.

If you traveled down the road a little more, there was a perlite cave like area that had been turned into an Apache Tears concession, where buckets and rock picks were rented out and you could go into this almost cave perlite structure and pick apache tears out, fill your small bucket and when you were tired, and take them home. No eye protection was offered, and I remember rock grit flying into my face and sometimes into my eyes. You quickly learned to look away when you picked.

The first picture shows the current Apache Tears Mine location, fenced off and looking pretty precarious to stand under. The active mine is private and you are not allowed to mine there. The second picture shows all that remains of my collection of Apache Tears from the Apache Tears Mine. Someone in my family decided that the Perlite should be removed. Arghh!

Apache tears originate from siliceous lava flows, lava domes, or ash-flow tuffs, often in close association with or embedded in, gray perlite. The spherules occur as cores within perlite masses that typically exhibit texture of concentrically curved, onion-skin fractures. Formation is apparently related to differential cooling and various alkali and water contents. Excessive water present during cooling and quenching of rhyolitic lava causes obsidian to hydrate (i.e., Water entering the obsidian glass converts it to perlite). Where perlite is incompletely hydrated, fresh obsidian cores remain as pebbles of marekanite or Apache Tears. (ref. Wikipedia)

Apache tears are well known from tertiary volcanic terrain in numerous localities throughout the western United States, particularly Arizona. Several districts in western Nevada also have yielded abundant marekanite eroding from tuff beds. (ref. Wikipedia)

As a child, I was told the about the origin of the name "Apache tear". As legend has it, in the 1870s, some Apache Indians and US Cavalry fought on a mountain overlooking what is now Superior, Arizona. The outnumbered Apache warriors rode their horses off the mountain to their deaths rather than be killed or captured by the cavalry. The wives and families of the warriors cried when they heard of the tragedy, and their tears turned into stone upon hitting the ground. For those of you who might be gullible, no this can't be true, and it is a very sad story anyway. Due to the origin of the legend, only marekanite from the area near Superior, AZ can be called Apache Tears.

from Breccia, 5/20

Thunder-Egg Definition by Duane Flackus

A thunder-egg is a spherical nodule-like rock usually that can range from an inch to a meter in diameter, usually containing a center of various colored solid mineral (agate, quartz, jasper, etc.), and an outer shell appearance of ordinary rock. The thunderegg is Oregon's state rock (March 30, 1965).

The world's largest thunder-egg (3500 pound specimen) is housed by the Rice Northwest Museum of Rocks and Minerals in Hillsboro, Oregon.

from The Clackamette Gem, 5/20

Young Tumblers

Calling All Young Tumblers

Diamond Dan has generously given us permission to post and/or distribute May's Mini Miner's Monthly, a publication for young rock hounds. Please go to our website and download your copy. It has a lot of good activities for our Young Tumblers. They will not only learned some interesting rock and mineral facts but also pass the time doing the activities.

How to Make a Crystal Egg Geode by OneMommy

Crystal Egg Geodes STEM Activity

Materials Needed:

- 3-4 Raw Eggs
- Craft Glue
- Epsom Salt
- Food Coloring
- Small Containers
- Small Paint Brush
- Toothpick
- Water
- Small Pot and Stove
- Small Screw Driver (optional)



Directions:

To make your egg geode, carefully crack your egg at the narrow end. It may be easier to do this by tapping the end with a small screwdriver.

Slowly widen the hole in the egg until it is a little larger than a quarter.

Empty the contents of the egg into a bowl. You can use it later to bake some fabulous muffin recipes with the kids.

Rinse the egg shell out. Then gently rub your finger around the inside to remove the egg's Membrane.

Once the membrane is removed, turn the egg upside down on a paper towel and let it dry completely before the next step.

If you want, you can dye the egg shell before letting it dry. We dyed our eggshells separately and then added a second color for the crystals later.

Once the shells are dry, use a paint brush to coat the entire inside of the shells with a thin layer of craft glue.

Sprinkle Epsom salts onto the glue, shaking off any excess. This will act as a starter to help grow your crystals in your homemade geode.

Let the glue dry completely.

Once the glue is dry, boil 1 cup of water.

Remove the water from the heat source and stir ins 1/2 cup of Epsom salt. Stir it until it is completely dissolved.

Continue stirring in 1-2 tablespoons of salt at a time until it not longer dissolves. Your super-saturated solution should be thicker then water when you stir it.

Place each hollow egg in a small container. (You could also use a Styrofoam egg carton for this part.)

Use a small ladle to fill each egg with your super-saturated salt solution.

Add a drop or two of food coloring and stir it with a toothpick.

Place the egg shells somewhere where they won't be disturbed. (We put ours on top of our refrigerator to keep the cat from messing with them.)

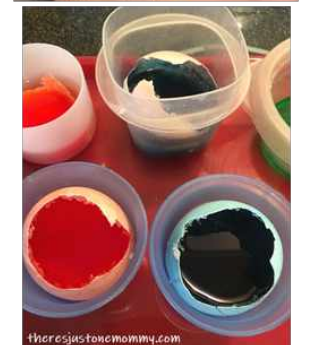
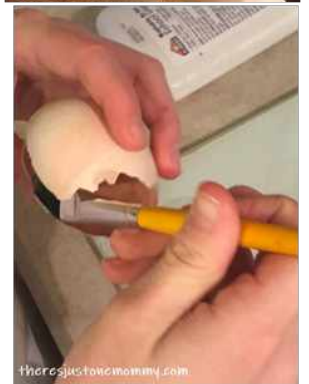
Check your egg experiment daily, and use a toothpick to break any thin solid layers that may form on top. You want the water to be able to evaporate!

After a few days, the water will evaporate, leaving behind beautiful homemade geodes!

How Geodes Form

Actual geodes are rocks with open spaces, or cavities, inside that are lined with crystals. The crystals form through a process called sedimentation, where particles (solute) are suspended in fluid (solvent) and then come together, accumulating to form crystals as the fluid disappears over many, many years.

When creating your egg geodes, the Epsom salt acts as the solute and the water as the solvent. The water is so saturated with Epsom salt that the salt particles fuse together, forming crystals as the water evaporates.



Why Are Rocks And Minerals Important? by Kat Koch

For millions of years, rocks and minerals have been very useful to humans.



Throughout history, rocks like jade and obsidian were used to make tools and weapons like knives, hammers, axes, and hooks for catching fish. Historically rocks and minerals have also been used as jewelry or body adornments. Before humans had matches, rocks were used to create different tools meant for starting fires.

Minerals and rocks are found in batteries, soap, paper, detergent, toothpaste, makeup, sports equipment, dishes, pencils, cement and more. Rocks are used in all kinds of construction like ships, cars, roads, planes, buildings, homes, cellphones, televisions, radios and appliances. Some types of rocks like granite are used to make statues, counter tops, and gravestones.

Imagine if we didn't have any of the products listed above. Wow! Where would we be without rocks and minerals?

95% of the Earth's crust is made of igneous rock (formed when lava from volcanoes or magma cools). Of the over 4000 minerals on planet Earth, only about 30 of them can be commonly found in Earth's crust.

It is estimated that the average person on the Earth will use over one million pounds of rocks, minerals, and metals in a lifetime! That's the equivalent of approximately 50 Orca whales. Hard to believe isn't it?

Sources: Wikipedia, Science for Kids Club, Science Trek, USGS, Britannica.



Uses Of Graphite

Graphite (both natural and synthetic) is an excellent conductor of electricity and heat, and it is highly stable at high temperatures. Additionally, it is inert and exhibits high lubricity (it acts as a lubricant). Its lubricity may be due, at least in part, due to the easy planar cleavage; although a condition called superlubricity (a loss of friction related to shifts in the orientation of the atomic structure). All of these characteristics make graphite highly sought for the following uses:

Pencil "lead" (in 2011 this accounted for 7% of graphite use)

Lubricants - gears of mining machinery, locks

Crucibles

Paint

Blast furnace linings (such as steel and cement industries)

Stove polish

Batteries: electrodes (ex: Nissan Leaf lithium-ion battery contains 88 pounds of graphite)

Steel making (carbon steel)

Brake linings (although other non-asbestos substitutes are increasingly used)

Mold wash (increases ease of separation of item cast)

Fire retardant/heat shield - graphite foil can be used in computers as lightweight heat sink; firestop around fire door; collars around plastic pipe to resist fire damage; heat-resistant gaskets

Heat resistant oil/grease

Superconductors, when layered with other ions like potassium, calcium

Carbon fibers: fishing poles, golf clubs, car bodies, plane fuselages, bicycles, walking sticks.....

Smokeless powder for guns (prevents static charge)

Radar absorbent tiles and other materials

Absorbs high energy particles: neutrons in nuclear reactors, Large Hadron Collider

Conductive ink

from Daisy Mountain Rockchip, 3/20

June 13th Fieldtrip to Redtop (Agate, Jasper, Crystals) by Roger Danneman

On June 13th we will be going to the west side of Red Top mountain north of Cle Elum. There is no hike involved, but you do need to cross a rock slide which is fairly steep. Dig site is just above the rock slide and under tree canopy. The agate is fairly plentiful just under the surface there, and is a light bluish grey color. The jasper has nice creamy blue and brown tones, sometimes with blue veins or inclusions, and beautiful red jasper can be found there as well. Crystals and geode fragments can be found in the hard rock and in the rock slide, as well as the dig site.

Meet at 9:45 at the Mineral Springs Store (Mineral Springs Resort on Google Maps) 27510 US-97. If you pass FR 9738 (Blue Creek Rd), you've gone too far, as this is the road that the group will take towards the dig site. Mineral Springs is about a 2 hour drive from Renton/Kent, over Snoqualmie Pass.

Group leaves promptly at 10:00. Dig and hard rock tools. The Cle Elum Safeway is another good intermediate stop for coffee, facilities, gas, or snacks.

Remember to check the Field Trip Reports tab to see what material has been found on previous trips and locations.

Roger Danneman (roger.danneman@gmail.com 425-228-8781 or 425-757-3506 cell)

Plan on Joining Us for Our Monthly Field Trips

Just a reminder that we are having our monthly field trips. The weather is usually good this time of the year for some serious rock hounding.

This month's field trip is June 13th to Redtop for agates, crystals and geodes. Check our website for more information and pictures of what we expect to find. The meet up info and how to contact Roger are there too.

The following COVID-19 Precautions in place are:

- 1). If you're feeling symptoms, stay home & take care of yourself.
- 2). No car pooling except among a household (or trusted friend).
- 3). We'll use 6' distance guidelines on trail and dig sites.
- 4). Let Roger know if you plan to attend.
- 5). Experts are recommending face coverings when on a trail. My thinking

is just to avoid another person's exhaust. Either way, we are accepting a certain element of risk being around other people.

Do what you believe is necessary to keep yourself safe.



Origin Of Precious Metals: Neutron Star Mergers

While hydrogen and helium atoms were formed in the "Big Bang", heavier elements like carbon and oxygen were formed later in the cores of stars through nuclear fusion of hydrogen and helium. But this process can only build elements up to iron. Making the heaviest elements requires a special environment in which atoms are repeatedly bombarded by free neutrons. Elements higher up the periodic table are built as neutrons stick to their atomic nuclei.

The gold or platinum in your jewelry was in all likelihood forged during the brief but violent merger of two orbiting neutron stars somewhere in the universe.

Apart from black holes, neutron stars are the densest objects known in the universe. They are created when a massive star exhausts its fuel and collapses onto itself, compressing a mass comparable to that of the sun to a sphere only 10 miles across.

Neutron star mergers can account for all the gold in the universe, as well as about half of all the other elements heavier than iron.

Approximately 4.6 billion years ago, our solar system was a cloud of dust and gas known as a solar nebula. Gravity collapsed the material in on itself, as it began to spin, forming the sun in the center of the nebula.

With the rise of the sun, the remaining material began to clump together. Small particles drew together, bound by the force of gravity, into larger particles. The solar wind swept away lighter elements, such as hydrogen and helium, from the closer regions, leaving only heavy, rocky materials to create terrestrial worlds. But farther away, the solar winds had less impact on lighter elements, allowing them to coalesce into gas giants. In this way, asteroids, comets, planets and moons were created.

During the formation of Earth, molten iron and nickel sank to its center to make the core. This took with it the vast majority of the planet's precious metals, such as gold and platinum. There are enough precious metals in the core to cover the entire surface of Earth with a four-meter thick layer. Our planet's accessible reserves of precious metals are the result of a bombardment of meteorites more than 200 million years after Earth was formed. Meteorite gold was thus added to the mantle alone and not lost to the deep interior. Igneous events, return gold to the surface and make it accessible for mining.

Gold is one of the few elements to occur in a natural state. It is found in veins and alluvial deposits. It's average abundance in the earth's crust is 0.004 parts per million.

from The Quarry, 4/20

Amber is fossilized tree resin. Copal is unfossilized tree resin.

No Shows This Month

Internet Addresses

40 Years Later: The Eruption of Mt. St. Helens and the USGS Response: Overview

<https://usgs.libguides.com/msh40>
from USGS Twitter feed, 5/15/20

10 Ways Mt. St. Helens Changed Our World

<https://pubs.usgs.gov/fs/2020/3031/fs20203031.pdf>
from USGS Twitter feed, 5/21/20

The Crystal

by Josilyn Teague

Like a prism the crystal sparkles.
Always making us witness to its marvels.
How does it always captivate us some ask?
But the crystal stays quiet for it has but one task—
To make us all want it, to make us say I must have it.
To make us cry if we don't, but brag if we have it.
The crystal laughs as it sees us a bustle,
It wins our hypothetical battle without any muscle.
But we don't want the crystal for its beauty.
We want to wear it and become that same ruby.
But why does the crystal want you to be jealous of if for?
Because deep down it knows it's just a mineral and it will never be more.
from Lake George Gem & Mineral Club News, 5/20

So Many Elements, Not Enough Minerals? by Theo Kloprogge

The 92 elements occur in very different quantities or concentrations on earth, from very large, such as oxygen (almost half of the mass of the crust) to extremely small, such as astatine (estimated at 44 milligrams in the entire crust). A limited number of minerals consist essentially of only one element (for example diamond, and some gold, silver, copper and platinum - but of course alloys of these metals are more common, such as the silver-gold alloy electrum). Most minerals generally comprise a combination of two or more elements.

The number of theoretically possible combinations of these 92 elements can be calculated. Mathematically, there are a few thousand combinations possible for just 2 elements, around a hundred thousand for 3 elements, and several million combinations for 4 or 5 elements. Some minerals even comprise 10 or more elements. Still, there are only about 4,500 minerals. Why are there so few combinations of these 90 odd elements? There are several reasons for this.

1) There are 14 elements that do not participate in the possible combinations: two elements are not stable (Tc and Pm), six elements are extremely rare (Po, Ra, At, Fr, Ac, Pa) and the six noble gases (He, Ne, Ar, Kr, Xe, Rn) do not form any stable bonds with any other element. This reduces the number of possible 'participants' from 92 to 78.

2) Yttrium and the 14 stable lanthanides (the Rare Earth Elements, such as lanthanum, cerium and europium) generally behave as a single 'block' of elements; they are always found together in minerals, be it in varying ratios. This means that the number of possible participants has now decreased from 78 to 63.

3) About 10 elements (for example Ga, Hf, Rb) are only found widely dispersed (see text further down). They occur as trace elements in the presence of other elements with similar chemical behaviour that are present in much larger quantities. They are almost never concentrated enough to form their 'own' minerals. This brings the number of possible participants down to 53.

4) A large number of combinations of the 53 elements left over are simply not possible, because two negative or two positive ions cannot bond together, (similar charges repel), or because certain combinations are not stable under natural conditions.

5) Finally there are 8 elements that occur in such large quantities in the crust (together they form 98.5% of its mass), that they strongly limit the number of possible combinations. Quartz and the silicates rule the crust! The other 45 elements do not come to the foreground in specific minerals, unless one or more of the 8 elements are absent in a certain geological or geochemical setting.

In conclusion, we must be happy that there are currently about 4,500 minerals, and every year, despite everything, we find about another 50 new ones.

from The Mineralogical Society of Queensland Inc. Newsletter, 12/10
