

The CMS Tumbler

February 2023



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

Next Meeting:
February 9, 2023
7:00 p.m.

American Legion Hall
25406 97th Pl S
Kent, WA

The Program & Show
& Tell will be a Member
Lapidary Collection
Potpourri
(see page 7 for more info)

Connect with us!

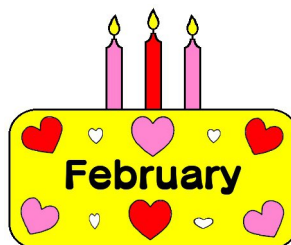
Website: <https://www.cascademineralsociety.org>
Club Facebook: <https://www.facebook.com/CasMinSoc/>
Facebook Groups: <https://www.facebook.com/groups/1168207926650075>
Show Facebook: <https://www.facebook.com/cascadegemandmineralshow>
Instagram: <https://www.instagram.com/cascaderockclub/>
YouTube Channel (Please like and subscribe):
https://www.youtube.com/channel/UCaGIJxaWFatV_JjgZRm9ESA



This month remember
to wish a
Happy Birthday to
Linda Jorza on February 12
Scott Harris on February 14
Arleaha Werts on February 14
Jae Cites on February 15
Peter Williams on February 18
Maxim Tokmakov on February 22
Scott Miles on February 23
and also remember
to wish a
Happy Anniversary to
Garry & Kathy Hartzell on February 13 (52 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.

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Show Display Case Presenters Peggy Shashy	904-655-3241	14thebirds@bellsouth.net
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Show Event Volunteer Recruiter		
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Spinning Wheel Angie & Brian Bayer	253-569-0245	Text to her number (no email)
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Videographer – YouTube Channel	Vacant	

2023 CMS Dues are \$30 per year per family

Pay online, by mail, or at our meetings.

New mailing address: Cascade Mineralogical Society, c/o Ananda Cooley, 300 Lenora St. - PMB 6145, Seattle, WA 98121

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.

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 association's purpose 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 local rock and gems shows and planned field trips. It's a great resource if you want to plan on an 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 information for the 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

Our meetings are now on YouTube. The meeting will be available, at the latest, on Sunday night following the meeting. Don't forget to "Like" and "Subscribe"! [YouTube Link](#)



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

NFMS Needs Your Canceled Postage Stamps

Every year the NFMS collects postage stamps from its member clubs. They have a stamp company that buys them, and in turn, these funds are donated to cancer research. Every year NFMS donates around \$5,000.

On letters that you receive, tear the corner with the stamp off. Try to leave about 1/4" of the envelope around the stamp. Be careful not to damage the stamp. Place the stamps in a plastic baggie and bring them to the meeting. Our member, Mike Blanton, collects the stamps and turns them over to the NFMS at the regional rock and gem show. You can give them to Mike as often as you want throughout the year.

Collecting the stamps is another way we rockhounds give back to our community.



Don't Forget To Show Your Membership Card At These Retailers

The following businesses are loyal supporters of our rock club. Show your membership card at the following stores and get a 10% discount on most purchases.

Jerry's Rock Shop – 804 W Valley Hwy, Kent, WA 98032

Minerals, rough or polished rocks, lapidary machines, lapidary supplies, polishing grit, fossils, rock hounding tools, beautiful display specimens, jewelry, and much more. *Please be aware there are a few items they can't offer the 10% discount on.*

Jerry is a great supporter of our club. They make it possible to have nice door prizes at our meetings.

Blackjack Metal Detectors and Mining Equipment – 101 Park Ave N, Renton, WA 98057

They sell beautiful mineral specimens, fossils, books, metal detecting and gold panning equipment and supplies. Chris Holden is a CMS member!

New for Members Only – New Texting Service

We are busy and often forget that CMS has an upcoming meeting or event. Therefore, we have a texting service to remind members of CMS meetings and events.

Everyone is automatically entered into this service. You can opt out anytime by responding with STOP.



For quick access, you can scan the following codes.



Access CMS Club Instagram page



Access our CMS YouTube channel

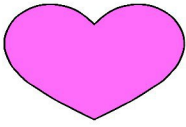




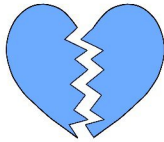
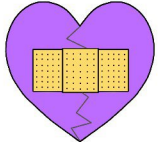


Access our CMSclub website for the latest on meetings and club events



Access CMS Facebook Groups

February

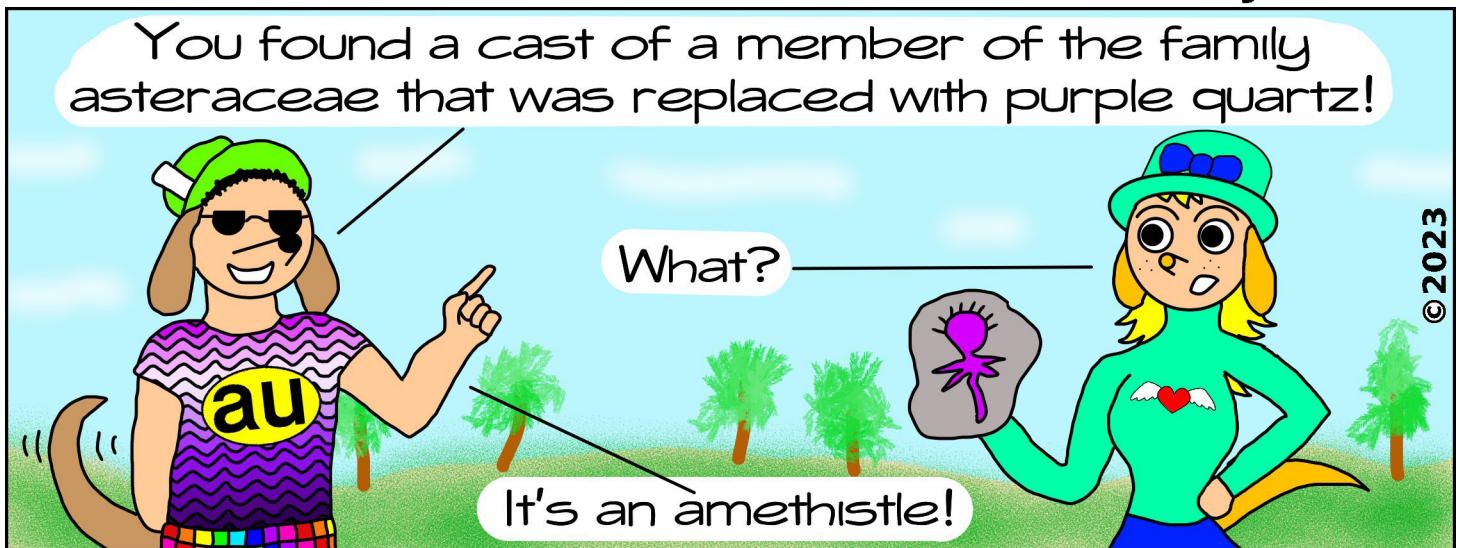
Sun	Mon	Tue	Wed	Thur	Fri	Sat
			1	2	3	4
5	6 Board Meeting 7:00 pm	7	8	9 General Meeting 7:00 pm	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

CMS Show Committee Meeting:....Monday, February 6.....6:30 pm to 7:00 pm
 CMS Board Meeting:.....Monday, February 6.....7:00 pm to 8:00 pm
 CMS General Meeting:.....2nd Thursday, February 9.....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)

Son of Mr. & Mrs. Rockhound

by KAM



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

CMS Show Committee & Board Meeting Minutes January 9, 2023

by Pete Williams, 2023 Secretary

Attendees: Kat Koch; Linda Jorza; Pete Williams; Rich Russell; Paul Ahnberg; Kathy and Gary Hertzal; Mike Blanton; Charles Benedict; Ananda Cooley; Peggy Shashy

Show Committee meeting called to order: 6:35

The West Seattle Club had their trailer stolen where all their display cases were stored. Items discussed by the Show Committee included: No one yet has volunteered to be show chair; a mailing coordinator is needed; an advertising coordinator (other than social media) is needed; show times were set at Saturday 10-5 and Sunday 10-4; and a flyer design was selected.

To celebrate the clubs 75th anniversary Kat will check the cost of a large banner. A large cake can be purchased and given out to all attendees. Ananda and Peggy will check what other clubs are pricing their booths (for 8x8, 8x10 and 6x8). Paul will contact food vendors to reserve for the show. Suggestions were made on having more display cases and moving them closer to the club's other tables.

Board Meeting

The club is doing fine financially right now. Gina and Kat will look into less expensive web hosting. A donation button needs to be put on the website. Paul showed planned monthly programs for 2023.

Kat mentioned that an AFMS person congratulated our club for all the innovative things our club is doing. Kat sent a letter to the Kent City Council on 12/30 requesting a place for a shop and meeting area. There has not been a response back yet. A discussion was had on using "MeetUp" to start a Rock Hound get together on a Saturday or Sunday. A volunteer is needed to start this up. There is another Gem Faire in Puyallup on March 17-19. We can get a booth for \$1. A volunteer is needed to set up and take down the booth.

The club received a donation of a baby mammoth tooth from Alaska. It will be a great display piece for our show, but needs to be stabilized. Our club will donate a nice specimen worth at least \$75 to the upcoming NFMS/AFMS show in Billings, Montana in August.

Meeting adjourned at 8:29

CMS General Meeting Minutes January 12, 2023

by Pete Williams, 2023 Secretary

Club dues are scheduled to rise from \$25 for a family membership to \$30 on February 1. Someone donated their collection of rocks to our club and it included a baby mammoth tooth from Alaska. It needs to be stabilized to prevent further deterioration. This is something we can display at our show.

The Northwest Federation (NFMS) show this year will be in Billings, Montana. It will be a joint NFMS and AFMS show. Following the show will be a week of field trips. The AFMS has requested donations of at least \$75 retail value for their scholarship drawing. Kat will look at the club inventory to find something to donate.

Roger has posted the 2023 field trip listing on the web site. The first trip will be on March 11 to the Mt. Baker area.

Program: Video on finding thundereggs in Oregon followed by members sharing their collections of thundereggs.

From the Top of the Rock Pile... by Kat Koch

We have a Show Coordinator! Chris Vitellaro. If she should ask you to volunteer for some aspect of the show, please show your support by saying "Yes!" It takes a lot of hands to put our show together.

Chris is going to need a volunteer for the following areas:

1. The directional signs need to be reviewed to ensure they are in good shape. Then, if required, order additional signs. Then place them around the area the week before the show and pick them up after the show.

2. Keep track of the members that volunteer to help out at the show. Then make up the volunteer schedule for the various club tables for the duration of the setup and actual show.

We had good attendance at our January meeting on thunder eggs. Forty members attended and showed us their thunder eggs and a few outstanding geodes. I felt it was a fantastic meeting. It's always lovely when we visit one another and engage in some "rock talk."

Our three Young Tumblers, Mason, Bentley, and Jude, showed us their thunder eggs. In addition, Jude showed me his beautiful collection of sliced colorful rocks. Seeing our Young Tumblers participate in our meetings is really enjoyable! I hope we continue to see them at all our meetings.

Remember, our February meeting is on Fluorescent Rocks! The club will have a selection of fluorescent rocks, but I am also asking everyone to bring in some rocks or minerals of their own so we can see what colors they fluoresce.

We planned the February meeting on Fluorescent Rocks when our Young Tumblers are out of school so they can attend. Looking at fluorescent rocks is always a fun meeting for everyone.

Everyone is welcome to bring guests to any of our meetings.

I encourage you to attend our meetings as our club is more than just the field trips. We always try to have an educational topic, and it's also an excellent opportunity



to visit with each other and get your questions answered if you are having a problem cutting or polishing or need a rock or mineral identified.

So mark your calendars now – our meetings are always the 2nd Thursday of the month except for August and December.

We continue to get new members weekly by registering online. We have also had new members join at our meetings. We welcome each of you to our great rock and gem club. When you attend our monthly meeting, please introduce yourself to me, as I look forward to meeting everyone.

I also appreciate all the members that renewed their membership!
I am looking forward to seeing everyone at the February meeting.



Club Emails

Remember to allow any email from cascademineralsociety.org so that club communications don't go into your spam folder.

General Meeting – Thursday, February 9th

Topic: Lapidary and Collecting Potpourri with CMS Members

Do you intarsia, knapping, carve rocks, tumble, make jewelry, faceting, field trip finds, cabbing, polishing, silver-smithing, spheres, specific minerals, rocks or fossils, or ?

Do you collect a specific rock, mineral or fossil?

Please bring 3 to 6 samples and show them off at this meeting. Be prepared to tell us about your talent or collection.

Show 'n Tell: The topic at this meeting is our show 'n tell session.

Show Off Your Interests

We Would All Love To See What Our Members Are Doing



General Meeting – Thursday, March 9th

Topic: Cutting and Polishing with Roger Danneman, our club Field Trip Guide

If you are having a problem polishing, cutting or anything else this will also be a good opportunity to get your questions answered.

Show 'n Tell: Show us what you have cut or polished. If you have not done this yet, then show us something that is polished that you have in your collection.



General Meeting – Thursday, April 13th

The following meeting has been planned for April because the Kent, Renton, and Covington School Districts are on spring break, so all our Young Tumblers plan on attending this fun meeting as there is no school the next day. Bring your friends too.

Topic: Fluorescent Follies!!

Not all rocks are what they seem. We have all heard about shapeshifters in sci-fi movies. Some rocks and minerals are real life color shifters?

The club will have a collection of fluorescent rocks for everyone to see. It is interesting to see the different colors rocks become under short or long-wave UV lights. We will then examine members' rocks and see what happens under UV light.

Show 'n Tell: This is a fun meeting for everyone. Gather up your rocks and bring them to the meeting. Lets see if they are fluorescent!!

General Meeting – Thursday, May 11th

Topic: Metaphysical Minerals with Kim Villines of Earthlight Gems (Tentative)

It has been sometime since we have had a meeting on this topic. We are aware a lot of our members are interested in the metaphysical properties of minerals and also the seven chakras.

Paul, CMS Board Director of Programs, is working with Kim to be a presenter at this meeting.

Show 'n Tell: Bring to the meeting what you consider your lucky rock, mineral or piece of jewelry.



Looking For Volunteers

Videographer: Needed at our general meetings: A volunteer to videotape our meetings. Up to you if you want to edit the video or not. We have free editing software to post the video to our YouTube club channel. We meet on Thursday, and the video needs to be uploaded by the following Sunday.

Historian: Copies of the Tumbler, pictures from club events and club officers, and other memorabilia from the club. Put everything including the Tumbler issues in a scrapbook. The club will reimburse you for any expenses to preserve our history. In addition, various members have older content they can provide you.

If you decide you can help out, text or call Kat Koch. president@cascademineralogicalsociety.org or 425-765-5408



CMS is Celebrating 75th Years in 2023!

Happy Birthday CMS

75 years is such a milestone for our club.

When Boeing divested itself of their employee clubs in 2010, CMS didn't know for a few years if we would survive.

We have thrived and grown with a lot of work from the Board and our membership.

Thank you to each and every one of you for making CMS a success!



Geoheritage Sites In The United States by Kat Koch

Geoheritage sites in the United States include officially designated landmarks and areas with a high level of distinct conservation management, such as national parks, monuments, historical landmarks, natural landmarks, and World Heritage Sites. Many of these areas were designated because of their distinct geologic features, geologic history, or combination of both. Federal land-management agencies, such as the National Park Service (NPS), Bureau of Land Management (BLM), and U.S. Forest Service (USFS), manage these sites to conserve their unique features and characteristics for future generations.

Kansas - Little Jerusalem Badlands

These badlands are Kansas' most dramatic Niobrara chalk formation. They provide unique and important habitats for many plants and wildlife. Native amphibians, reptiles, and birds like ferruginous hawks and cliff swallows live here. Little Jerusalem is also home to the largest population of Great Plains wild buckwheat. This native plant is found in the chalk bluffs prairie of western Kansas and nowhere else in the world.

The Kansas Legislature established Little Jerusalem Badlands State Park in 2018. The 332-acre park encompasses 220 acres of badlands – fragile but ruggedly spectacular geologic formations adjacent to the 17,290-acre Smoky Valley Ranch. The Nature Conservancy owns both properties. The Nature Conservancy will continue to hold both properties, and KDWP is partnering with The Nature Conservancy to develop and manage visitor access and use of Little Jerusalem Badlands as a state park.

Little Jerusalem Badlands State Park showcases a mile-long stretch of 100-foot-tall spires and cliffs of eroded Niobrara Chalk, a layer of rock deposited about 85 million years ago. Niobrara Chalk was formed by sediment that settled at the bottom of an inland ocean called the Western Interior Seaway, which covered most of central North America roughly 140 to 70 million years ago. The sediment became compressed over time, and the seaway floor was lifted by the same tectonic shifting that formed the Rocky Mountains.

The chalk outcroppings have had many names. In the late 19th century, they were said to resemble the ruins of many castles, thus "Castle City." Some say that it got the name "Little Jerusalem" or "New Jerusalem" because it looks like the ancient walled city of Jerusalem from a distance. By the time The Nature Conservancy acquired the property, most modern-day locals and geologists knew it by Little Jerusalem.



Michigan – Keweenaw Peninsula

The peninsula measures about 150 miles in length and about 50 miles in width at its base.

The ancient lava flows of the Keweenaw Peninsula were produced during the Mesoproterozoic era as a part of the Midcontinent Rift between 1.096 and 1.087 billion years ago. This volcanic activity produced the only strata on Earth where large-scale, economically recoverable 97 percent pure native copper is found.

Much of the native copper found in the Keweenaw comes in the form of cavity fillings on lava flow surfaces, which has a "lacy" consistency, or "float" copper, which is found as a solid mass. In addition, copper ore may occur within conglomerate or breccia as void or interclast fillings. The conglomerate layers occur as interbedded units within the volcanic pile.



The Keweenaw Peninsula and Isle Royale, formed by the Midcontinent Rift System, are the only sites in the United States with evidence of prehistoric aboriginal mining of copper. These ancient indigenous people traded artifacts from this copper as far south as present-day Alabama. These areas are also the unique location where Chlorastrolite, the state gem of Michigan, can be found.



Oklahoma – Oklahoma's Official State Rock—The Barite Rose Rock

Few mineral specimens are as distinctly recognizable and traceable to the source as the barite roses from Oklahoma. These are also known as "rose rocks" and "barite-sand rosettes." Besides minor occurrences in Kansas, Morocco, and Australia, the barite roses are unique to Oklahoma.

These objects of collectors' desire were formed during the Permian era (250 million years ago) when ocean waters covered the western half of Oklahoma, and the counties of central Oklahoma were under shallow bays. Over time, barite (barium sulfate, BaSO4) precipitated out of seawater and crystallized around grains of quartz sand. Over eons, the ocean retreated westward, and a geologic formation of reddish sandstone locally called the Garber sandstone, was left in a broad band across central Oklahoma. Rose rocks occur in outcrops of Garber sandstone from southern Lincoln through eastern Oklahoma and Cleveland counties and into McClain and Garvin counties (from Guthrie to Pauls Valley) and occur prolifically east of Noble and Norman.



The Barite Rose can be found as a single rose or a cluster of roses, and these specimens range from the size of an English pea to about four inches in diameter. The largest single specimen ever discovered was seventeen inches in diameter and ten inches high, weighing 125 pounds. The largest cluster weighed more than one thousand pounds.

Bibliography: US National Park Service, Wikipedia, Individual Websites for the states of Kansas, Michigan, and Oklahoma

Diamonds Were The First Mineral In The Universe by Kat Koch

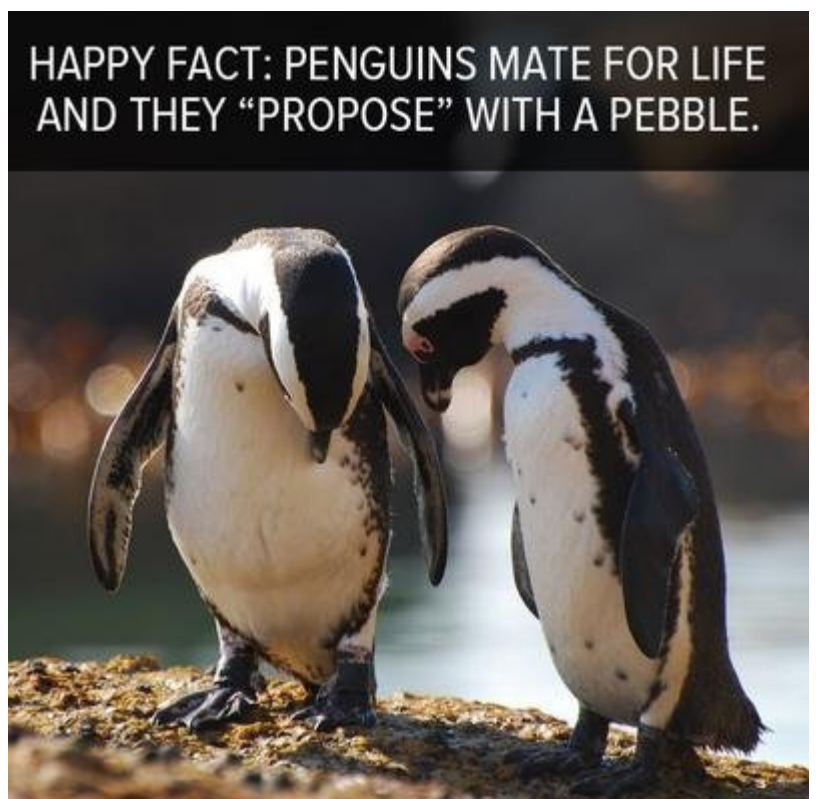
The first minerals to form in the universe were nanocrystalline diamonds, which condensed from gases ejected when the first generation of stars exploded.

Nanodiamonds are diamonds with a size below 100 nanometers. Meteor impacts can also produce them.

The larger diamonds that humans more typically encounter crystallize under extreme pressure and temperature conditions deep inside Earth.

Another strange phenomenon is around Valentine's Day, Christmas, or on a birthday, these larger diamonds found on Earth can be seen in abundance on the fingers of humans.

Bibliography: Carnegie Science, Wikipedia



Young Richard's Almanac by Dick Morgan

As we enter another February and look forward to Valentine's Day as the time for lovers to get ready for their future life together.



Nipper Mounts by Jennifer Haley, AFMS Historian

I hadn't heard of "Nipper Mounts" before, and when I came upon an article in a 1963 Rocks and Minerals Magazine about them, I thought you might find it interesting too.

In the summer of 1951, some rockhound friends went on a road trip from Northern Maine to New York State to meet up with a mineral collector like themselves. His name was Mr. Ray Letson, who was known to have a very fine mineral collection. It was very common to swap minerals with other collectors back then, and people were so eager to share.

What the travelers were especially impressed by were Ray's, "Nipper Mounts." For the mineral collector living in an apartment with little room to display or hold their ever growing earthly collections, the idea of making or collecting "Nipper Mounts" was ideal. The name came from using a pair of nippers to nip off a small specimen from a larger specimen. The specimen was glued onto a 1" to 2" card with the name of the mineral and its locality. Ray enjoyed making these to sell and giving them to the Boy Scouts.

The travelers created their own form of "Nipper Mounts." In their criteria they used minerals which were 1/4" to 1 1/4" long mounted on clear flat plastic. Later they created upright and upside-down "U" shapes made of clear plastic to display some of their specimens better. Some of their friends liked to display their "Nipper Mounts" on golf tees.

Every time the travelers entered competitions at rock and gem shows, they won awards for their "Nipper Mounts." The travelers commented, "Next to micromounts, "Nipper Mounts" are the most perfect of the works of the Great Mineralist, but unlike micromounts these may be seen with the naked eye, thus are more easily shared with others. Everyone who sees them finds them interesting, beautiful, and is completely captivated by them."

from AFMS Newsletter, 5/22

Rare Earth Minerals by Steve Mulqueen

Rare Earth Minerals, definition: The rare earth minerals (REM) are naturally occurring inorganic substances that contain one or more of the metallic ions associated with the rare earth elements (REE). The REE include those featured in the Lanthanide Series of the Periodic Chart, as well as the two elements Scandium and Yttrium. Listed below is a complete list of the REE.

Rare Earth Elements

<i>Atomic Number</i>	<i>Atomic Symbol</i>	<i>Element Name</i>
21	Sc	Scandium
39	Y	Yttrium
57	La	Lanthanum
58	Ce	Cerium
59	Pr	Praseodymium
60	Nd	Neodymium
61	Pm	Promethium
62	Sm	Samarium
63	Eu	Europium
64	Gd	Gadolinium
65	Tb	Terbium
66	Dy	Dysprosium
67	Ho	Holmium
68	Er	Erbium
69	Tm	Thulium
70	Yb	Ytterbium
71	Lu	Lutetium

Occurrence of Rare Earth Minerals

The rare earth minerals (REM) are associated with alkaline igneous rocks such as pegmatite granites, carbonate intrusive rocks such as carbonatites, or hydrothermally emplaced rocks associated with the precipitation of minerals from high temperature water solutions. A mineral containing rare earth ions, occurring in molecular form, was first discovered and identified from a mine in Ytterby, Sweden during the year 1787. The mineral was initially named ytterbite, and the element it contained (in ion form) named ytterbium, both designations derived from the discovery site. Ytterbite was later renamed gadolinite.

List of Common Minerals That Contain Some of the Rare Earth Elements

aeschnite	allanite	apatite	bastnäsite	britholite	brockite
cerite	fluocerite	fluorite	gadolinite	monazite	parisite
stillwellite	synchysite	titanite	wakefieldite	xenotime	zircon

Rare Earth Abbreviations

- RE = rare earth
- REM = rare earth metals

- REE = rare earth elements
- REO = rare earth oxides
- REY = rare earth elements and yttrium
- LREE = light rare earth elements (Sc, La, Ce, Pr, Nd, Pm, Sm, Eu, and Gd; also known as the Cerium Group)
- HREE = heavy rare earth elements (Y, Tb, Dy, Ho, Er, Tm, Yb, and Lu; also known as the Yttrium Group)

Uses of the Rare Earth Metals

The metals extracted from ore deposits containing rare earth minerals have a variety of industrial uses. Listed below are some of their general applications.

Aerospace
Electronics
Lighting
Manufacturing
Medical Science
Metallurgy
Nuclear Science
Optics and Lasers
Petroleum Refining
Pollution Control Science
Power Generation
Power Transmission
Renewable Energy
Research & Development

Mining of Rare Earth Ores

Research in the use of the rare earth metals is ongoing throughout the world. The only active mining operation in the United States that extracts rare earth ores and produces rare earth oxides and their metals is at the MP Materials Corporation's Mountain Pass Mine in the Mojave Desert. It is located on the southeast edge of the Clark Mountain Range within San Bernardino County, CA. This deposit and mine can be seen along Interstate 15 in Mountain Pass, between the Cima Road and Nipton Road offramps. The deposit was discovered by uranium prospectors in 1949 after detecting moderate radioactive anomalies in the area.

The primary ore at the Mountain Pass Mine is a rock containing varying amounts of the mineral bastnäsité. The mineral contains varying amounts of the rare earth ions cerium, lanthanum, neodymium and europium. The deposit is a carbonatite orebody (carbonate intrusive igneous host rock) with associated minerals of barite, calcite and dolomite. Bastnäsité gets its name from its type locality, the Bastnäs Mine, an iron, copper and REE deposit in Sweden. Chemical analyses from the ores of the Bastnäs Mine led to the discovery of several new minerals and previously unknown elements by Swedish scientists. Cerium was identified in 1803 and lanthanum in 1839 from this deposit in Sweden.

Mill process operations at Mountain Pass for the refining of the bastnäsité ore begins with mining, crushing, screening and pulverizing operations. The separation of the mineral from the host rock is achieved through a flotation process in a aqueous liquid medium. This process takes advantage of the density difference between the mineral bastnäsité and the associated host minerals of barite, calcite and dolomite when air is introduced into the liquid medium containing an aqueous slurry of the finely pulverized rock with added flotation chemicals. Fine particles of rare earth oxide cling on to the rising bubbles in the flotation process for further separation. Worldwide, rare earth ores are mined and refined in eight countries including the United States, China, India, Russia, Australia, Vietnam, Brazil and Malaysia.

Reference

Refer to numerous sources of scientific data on the Internet under the headings of rare earth elements, rare earth minerals, rare earth oxides, rare earth metals and their many uses. Be sure to review the Lanthanide Series on the Periodic Chart and the two elements Scandium and Yttrium.

from Rockhound Rambling, 10/21

The Silence by Billy Benton

There is a silence that you hear and feel deep in the woods or at sunset in the desert when for a few moments the birds are hushed and the wind is stilled, but the most silent silence in the world is when the president of the club asks for a volunteer. PLEASE - stop sitting on YOUR good intentions and dare to say YES, I'LL HELP. Remember, it is not THEIR club or SOMEONE ELSE'S club, it is EVERYONE'S club and YOU are needed to make it work and grow. Please remember being busy may be a reason, but not an excuse. Everyone is busy (if in doubt check any officer's calendar.) The reason for this article is this, YOUR help is needed, so say YES when called on, or be daring--VOLUNTEER.

from CFMS bulletin, 2/23

Calcite by Prof. Philip R. Kesten, Ph.D., Department of Physics, Santa Clara University

Coming in at 3 on the Mohs hardness scale is calcite. Calcite is relatively common – it is easily found at sites all

across the United States, and easily and inexpensively purchased at mineral and gem shows and from online mineral and gem purveyors. Don't be fooled, however – calcite is anything but commonplace!

Calcite is one of the crystalline forms of calcium carbonate, a molecule in which a calcium (Ca) atom is bonded to a carbon (C) atom and three oxygen (O) atoms. (That's CaCO_3 if you are keeping score at home! And for completeness, another common form of crystalline calcite carbonate is aragonite.) Calcite is a primary constituent of limestone – and most sedimentary rocks – because calcium and therefore calcium carbonate is a primary constituent of the shells of marine organisms. Calcium is also a primary constituent of us – by mass, calcium is the fifth most abundant element in a human body, after oxygen, carbon, hydrogen, and nitrogen. We humans, and most living organisms, need calcium for good health, for example, to make strong bones and strong teeth, and to keep our muscles and nerves working properly.

Common varieties of calcite are either white in color, or transparent. But calcites are found in a veritable rainbow of colors – red, orange, yellow, green, blue, and purple, as well as shades of red-orange, brown, honey, and pink. Impurities interspersed with the calcium carbonate molecules imbue what would otherwise be a clear crystal with this wide variety of colors. A small amount of cobalt, for example, results in pink calcite. A few manganese atoms mixed in with the calcium carbonate molecules result in a light purple crystal, and a bit of malachite, rich in copper, results in green calcite. Perhaps you are like me – a few years ago I decided to build out a “sub collection” of specimens of calcite of different colors. You simply can't go wrong with a collection of calcite specimens!

And calcite is found not just in different colors, but different crystal shapes as well. As a general rule, calcite has a hexagonal crystal structure. But more than 300 variations have been identified within that overall hexagonal crystal habit.

It is common, for example, for calcite to form in clusters of hexagonal pyramidal crystals, that is, six-sided pyramids all pointing out in a different direction. Clusters of dogtooth spar are a fine example of this crystal structure. Often, and this is true of dogtooth spar as well as other varieties of calcite, the points of the crystals are hexagonal scalenohedrons, in which the bottom edges of the triangular sides of the crystals run zig-zag, up and down. Doubly terminated crystals of calcite, in which two six-sided pyramids form back-to-back, are also common.

Iceland spar, a variety of calcite so named because it was originally found in Iceland, is rather different in shape from its hexagonal cousins. The calcium carbonate molecules in Iceland spar are connected in a way that results in a box-like crystal. Iceland spar crystals are often transparent but sometimes a golden color. Crystals are often shaped like a rectangular prism but sometimes skewed so that one pair of opposite sides are parallelograms.

So certainly, the shape of a crystal of Iceland spar is pleasing on the eyes. But the arrangement of Iceland spar's constituent molecules also results in a spectacular optical phenomenon.

In a crystal of Iceland spar, the molecules of calcium carbonate are drawn toward each other more strongly – they are bonded together more strongly – in one direction than in perpendicular directions. As a result, bits of light wiggling in one direction as the light passes through the crystal moves more easily through it than light wiggling in perpendicular directions.

Wait! “Bits” of light? Light “wiggling?” Yes, and yes. Although you would not generally be aware of it, the light that is all around us is actually an enormous number of individual, tiny packets of energy called “photons.” In a real sense, photons are “bits” of light. And the electric and magnetic fields associated with each photon move along as sinusoidal waves, so they do indeed wiggle up and down as the photon moves. Moreover, they wiggle up and down in a plane – a plane that defines the polarization of the photon.

Most of the light around us is not polarized, that is, the plane in which any particular photon is wiggling is not the same as plane of any other photon. But light reflecting off a surface, say the trunk of a car in the traffic ahead of you on the highway, or the surface of the ocean, has a particular, specific polarization direction. Want to reduce the glare from oncoming cars while you're driving? Wear glasses that only allow light polarized in the direction perpendicular to the polarization of the reflected light to get through. Want to know which direction is north, in order to navigate the high seas? Sunlight becomes polarized as it passes through the atmosphere, and is scattered by air molecules as well as suspended water droplets and dust... even when it's cloudy. So finding the direction of that polarization tells you where the sun is in the sky. If you don't have a compass, you can pull out your handy specimen of Iceland spar – the direction of polarization of sunlight will immediately point the way! That's apparently what ancient mariners did; a piece of Iceland spar, used as a navigation device, was recovered from a ship that sank in the English Channel in 1592.

Okay, you might not be sailing on the ocean any time soon. But this optical characteristic of Iceland spar makes itself known in another way, a way that you can easily observe if you have a piece of Iceland spar to your collection. (And if you don't have a specimen of Iceland spar... you should get one!) When a beam of light passes through a crystal of Iceland spar, it gets split up into two separate beams. So put a pattern, say on a piece of paper, behind a specimen of Iceland spar and you will see two images of the pattern when you look through the crystal.

Calcite, by the way, is considered a semi-precious gemstone – calcite specimens of high optical quality are often faceted and set into jewelry. Perhaps not the best use of a piece of calcite, however. Because calcite is relatively soft (thank you, Mohs hardness!), it is easily scratched and therefore hard to maintain in pristine condition. So you will often see calcite classified as a “collectors stone,” but that's fine: collect some!

from Breccia, 3/22

Call It Chert

Geologists call it chert, archaeologists call it flint, Indians used it for arrowheads, spearheads and cutting tools, and rockhounds collect it. It's a rock, not a mineral, being composed largely of quartz molecules and trace minerals, in tiny, equidimensional granular crystals. By any name, or use, chert remains a something of a mystery, since even when easily

identified on sight and by simple tests, a shroud of scientific mystery cloaks its chemical composition. Cherts are often unexciting, gray colored masses that may form in extensive beds or layers. Novaculite is a form of chert found in massive beds in Arkansas. At Cado Gap, Arkansas, novaculite beds aggregate a thickness of over 9,000 feet. Even the most exacting professionals do not agree on its solubility and insolubility, of its silica and calcium content, of the precise age determination and the role of primary versus secondary processes in deposition or sedimentation.

Chert, which has a smooth surface, hardness and density near quartz, sharp edges and curved or conchoidal fractures, accumulates in streambeds as gravel and on hillsides and slopes within the soil. Being brittle, dense and harder than glass, chert stream gravel is valuable for road construction and for concrete aggregate. If the chert has a high clay content, it looks like shale and loses its hardness and utility.

There are various types of chert. The 'ugly' sorts of flint (dark like dull obsidian, finer grained and occurring in irregular nodules rather than layers), of jasper (containing even more impurities especially iron oxides, for reddish, brownish, greenish iron stains, of low luster and breaking with an even or flat conchoidal fracture.), of agate (more refined and translucent banded, pearly to colored), of Tripoli and mozkite are all varieties of chert. Its form varies from nodules, concretions, lenses and stringers to rounded and irregular tube material. If formed on land, chert is deposited like opal, opalite, porcelaneous; like the pearly gray waxy lustered nodules of the Mojave. When of oceanic origin, it can form as flint in pillows, or is layered with clay, or minerals, or volcanic ash, like the Waddell chert off the San Mateo coast. Chert is inconsistent in coloring, size and shape. It appears in most shades of the prism colors, being stained by iron oxides red, rust, tan, yellow and brown. Rockhounds know where to find chert, but scientists are still looking for a logical answer to how it got there.

via Golden Spike News, 1/23; via Breccia, 3/97; from Smoke Signals

Gold Trivia

Gold is one of the most recycled substances of all. It's quite possible that the gold contained in the first nuggets found over 6,000 years ago still exist today, melted and recast into a contemporary piece of jewelry or as the filling in your teeth.

Worldwide, wedding rings are probably the single biggest gold jewelry item. One of the traditions of the wedding ring on the third finger, left hand, is found in ancient Egyptians writings that describe the third finger as being connected by an artery to the heart. The innermost coffin of the three used to bury the young Egyptian Pharaoh Tutankhamen is probably the biggest gold object to have survived from antiquity. Uncovered in 1922, it represents 2,448 pounds of 22 karat gold, decorated inside and out.

In the western world, the proportion of gold is expressed in karats, using a scale of 24 karats as being 100% pure gold. If a piece of jewelry is made of 18 karat gold, it is 18 parts gold and 6 parts other metal, usually silver or copper. Gold is one of the most ductile and malleable of all metals. One ounce can be stretched into a wire five miles long or in a sheet so thin it covers 100 square feet. Gold has extremely low resistance to electric current and won't corrode or tarnish. A touch-tone telephone has 33 gold contacts.

via Rockhound Ramblings 7/06; via Pueblo Rockhounds 5/06; from Hy-Grader 1/05

Goethite $\alpha\text{-Fe}_3\text{O(OH)}$ by Dr. Ray Grant and Chris Whitney-Smith

Goethite, iron oxide hydroxide, FeO(OH) . It is orthorhombic but crystals are rare. It is usually reniform, botryoidal or stalactitic masses, often with a fibrous appearance. The color is blackish brown, reddish brown, and yellowish brown. It can also be fine-grained to powdery and the name limonite is used by many collectors and geologists for this material. Limonite is not a valid mineral name and usually refers to goethite, but there are two other minerals with the same formula, lepidocrosite and feroxyhyte that can also be limonite. These minerals and hematite form from the weathering and oxidation of earlier iron bearing minerals. The streak color is one of the best ways to identify goethite. It has a brownish yellow to yellow streak, hematite has a reddish brown to red streak, and lepidocrosite has a dull orange streak. Feroxyhyte has not been reported from Arizona.

Goethite is a common mineral in Arizona with about 133 localities listed in mindat.org but there are many more localities. It commonly is part of the residue left near the surface after the oxidation of sulfides like pyrite. This forms the leached cap, oxidized capping, or gossan (iron hat) of most ore deposits in Arizona. Gossans are typically siliceous, rocks consisting of altered original rock with mixtures of secondary iron oxides. The old-time prospectors would look for the gossans and dig there to find the richer deposits below.

from The Rockhound Record, 9/19

Tumbling Help by Kat Koch

There is a very informative website on helping you tumble various types of rocks. What grit to use for soft or hard stones and other tumbling tips and tricks. Check it out <https://rocktumbler.com/rough/before-and-after/>

The largest heart in the solar system is on Pluto, also called Tombaugh Regio after Clyde Tombaugh the discoverer of Pluto in 1930.

CMS 2023 Field Trip Schedule by Roger Danneman

This schedule is for planning purposes. Actual details will be sent out 1-2 weeks before each trip.

March 11th 2023 Field Trip to **Mt. Baker area** (agate, diopside, gneiss, jasper, and jade)

Two sites planned – these 2 sites are far apart; 1.5 hour drive between them; choose one or both; details later;

First at **Ole One Lane Bridge** on the Nooksack for Diopside which is a green rock that is "jade like" in appearance. This is an easy site where any vehicle and anyone can hunt/collect in a wide area of river rock.

Second at **Swift Creek** which flows into **Baker Lake** for blue agate, gneiss, jasper, and jade. This site has a steep access down to the river. Waders needed to cross the stream and get to the gravel beds for agate.

April 15th 2023 Field Trip to **Biggs Junction, Oregon** for Biggs Jasper/Agate

This is a 4-hour drive from Renton/Kent, and is a private claim being led by the landowner. We'll be leaving his shop in Rufus, Oregon at 8:30 AM, so most of us will be staying in The Dalles Friday night. This is the only trip where we need to pay for what we collect. \$2/lb for Beers Mountain jasper/agate and \$5/lb for China Creek jasper/agate.

April 16th (Sunday) 2023 Field Trip to **Saddle Mountain** (petrified wood)

Rough road going up the mountain, but once there and parked, the dig site is close to the parking area.

May 13th 2023 Field Trip to **First Creek** (agate, crystals, geodes)

This is a 2-mile hike on good road bed with moderate ups and downs. Dig sites on steep terrain. Some of us use jogging carts to haul tools and buckets. Also surface collecting in rock slides.

June 17th, 2023 Field Trip to **Little Naches** (thunder eggs, lily pad jasper, leaf fossils)

First site - 1/2 mile hike to thundereggs

Second site - next to the road for lily pad jasper/agate

Third site - next to the road for leaf fossils

July 15th 2023 Field Trip to **Greenwater** (agate, jasper, common opal)

First site- black and red agate, common opal; dig sites next to road.

Second site - ?

August 26th 2023 River site (TBD)

Hoping for some good intel regarding Carnelian on the Chehalis river

September 9th 2023 Field Trip to **Frost Mountain** south of Cle Elum (Tahoma agate/jasper/crystal)

This is an approximate 1-mile hike with some elevation gain.

September 16-17th 2023 CMS Rock and Gem Show at **Green River College****October 6, 7, 8th 2023** Field Trip and campout at **Crystal Mountain** near Ellensburg (agate/jasper/crystal)

Camping here is primitive, but last year we brought our own privy. We may need 2 group campsites. Coming up for just a Saturday trip is also an option. There is a wide variety of jasper/agate here, including travertine.

October 14th 2023 Field Trip to **Red Top** (agate, jasper, and crystal)

First - A short but steep hike up to our dig site.

Second - 1/2 mile hike up moderate steep trail to the Red Top Meadow

November 11th 2023 Field Trip to **First Creek** (agate, crystals, geodes)

We finish the season with a 2-mile hike back into one of my favorite areas - First Creek

The Rockhound by C. R. Taynton

He fears not germs. He licks the rocks with his moist tongue, the better to display the colors.

He fears not fatigue. He strikes the chisel with a hammer and digs with a pick for eight hours to obtain one small piece of agate.

He fears not danger. He climbs the face of a steep cliff to scratch out a specimen of epidote or garnet.

He fears not death. He invades the lairs of a rattlesnake and Gila Monster to search for a piece of wood.

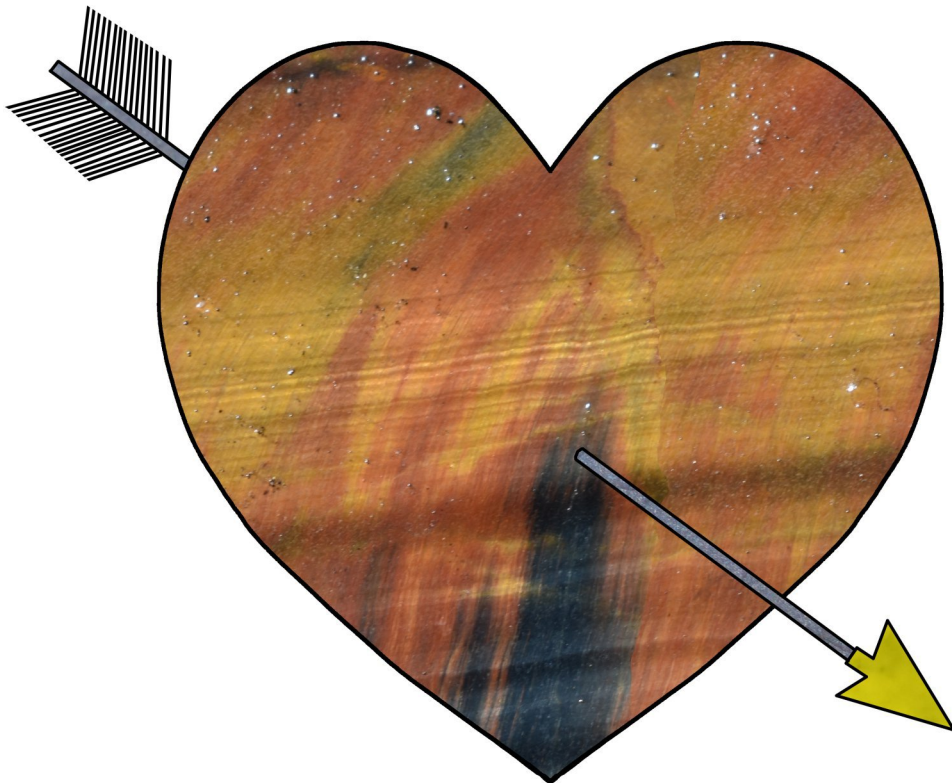
He fears not ridicule. He carries his small hammer and sack into lands where others hunt for wild boar and moose.

He fears not old age. He looks forward to retirement so that he will have more time to hunt for rocks.

He fears only sanity. For then he can no longer be a rockhound.

from Breccia, 1-2/23

White Gold was created to imitate the look of platinum. It is an alloy usually 75% gold and 25% nickel and zinc.



Shows

February 4: Saturday 9 am – 3 pm
Everett Rock & Gem Club,
Rockhounds Downsizing Sale (Cash only)
Carl Gipson Center
3025 Lombard Ave
Everett WA

February 11 & 12: Saturday 9 am - 5 pm; Sunday 9 am - 5 pm
Whidbey Island Gem Club,
57th Annual Sweetheart of Gems Show
The Center in Oak Harbor
51 Jerome St.
Oak Harbor WA

