

Cuyuna Rock, Gem and Mineral Society

The Agate Explorer

November 2019

Elections

Nominations will be accepted the day of the election, which is at the November 2nd general meeting. Members may serve on the Board if they have been a member for a minimum of one year.

Adult members must be present to vote.



Candidate for President

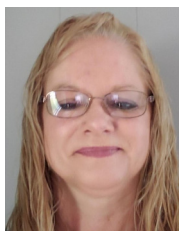
Ed Opatz. I have been president for the last two terms. I have been interested in rocks, mainly agates, since I was a small boy, but my interest has blossomed in the last 15 years or so.

Candidate for Secretary

Joanie Hanson. I joined the rock club several years ago and have been club secretary for the last 4 years. I have greatly enjoyed being an active member of this club and would like to continue as secretary as long as Rod and I are still living in the Brainerd Lakes area.



Candidates for Three Board Members-at Large



Lori DuBois. I have always been fascinated by rocks and minerals growing up. My grandparents first got me interested, then as a young adult a worked in a jewelry store which just fueled my interest.

Now having been a member of this wonderful club I am gaining knowledge and have the opportunities to share my passion with others. I love to see the kids' faces light up when they get something at the spinning wheel they think is pretty, especially when I can tell them what it is. It's a great way to learn and teach.

Vern Iverson
I have been interested in rocks since my youth. It gives my a desire to share my passion with others. My favorite rock is the Montana moss agate.



Franklin Art Center

Club Information

Website-www.cuyunarockclub.org
Email-cuyunarockgemclub@gmail.com

Meeting Place

Lower level
Franklin Arts Center
1001 Kingwood St, Brainerd, MN 56401

Directions

.4 mile east of Business Hwy. 371
& Hwy. 210 intersection.
(Castle turret water tower.)

Date/Time

the 2nd Saturday of each month
at 2 p.m. unless otherwise noted.

Club Dues

\$20/ family
Free /unaccompanied juniors
Membership runs
from Jan. 1-Dec. 31st.

Club Purpose:

To foster an interest (& encourage young & old) to study earth science, enjoy the art of lapidary, hunting for rocks, and semi-precious stones. We also strive to use what we know and acquire to further educate everyone who has an interest in our hobby.

We are a not-for-profit organization.

Rock Wrappers

*An open gathering for wire wrappers
starting at 10 a.m. on meeting Saturdays.*

Hang out with other wrappers, and work on your projects. (Bring all supplies needed.) Learn tricks to make wrapping easier, a new design, or perhaps a new place to find supplies. All skill levels welcome!

Club Calendar

November 2—Meeting—**NOTE CHANGE OF DATE, DUE TO FRANKLIN ARTS CRAFT SALE & OPENING OF DEER HUNTING ON NOV. 9.**

Includes elections and silent auction of members' items.

December 14 - Christmas Potluck Party

January 4, 2020—live auction of the Club members' Moe and Wagoner collections at the Sample show in Brainerd, 10:30 a.m.

January 11 —Meeting

February 8—Meeting

Information subject to change.

November Rock Shows

1-2—HURRICANE, UT: Southern Utah Rock & Gem Show; Washington County Fairgrounds; Daily 10-7; free; contact Antonella Funk, (435) 609-9265

1-3—KANSAS CITY, MO: Shows of Integrity; Kansas City International Expo Center; Fri. & Sat. 10-6, Sun. 10-6:30; \$6, ages 6 to 12 \$3; Website: www.showsofintegrity.com

1-3—EUGENE, OR: Gem Faire Inc.; Lane County Events Center; Fri. 12-6, Sat. 10-6, Sun. 10-5; \$7, under 12 free; Website: <http://www.gemfaire.com>

1-3—CLOVERDALE, CA: Karmic Beads & Gems; Cloverdale History Center; Fri. & Sat. 10-6, Sun. 10-4; free; Website: www.karmicbeadsandgems.rocks

2-3—OAKS, PA: Tuscarora Lapidary Society; Greater Philadelphia EXPO Center; Sat. 10-6, Sun. 10-5; \$6, under 12 \$1; @lapidary.org; Website: www.lapidary.org

2-3—CONCORD, CA: Contra Costa Mineral & Gem Society; Centre Concord; Daily 10-5; \$6; Website: <https://contracostamineralandgemsociety.org/>

2-3—BREWER, ME: Penobscot Mineral & Lapidary Club; Brewer Auditorium; Sat. 10-5, Sun. 10-4; \$2, under 12 free; contact Sharon Wright, (207) 577-3770

2-3—MOUNTAINSIDE, NEW JERSEY: Annual show; New Jersey Mineralogical Society & New Jersey Lapidary Society; Trailside Nature and Science Center, 452 New Providence Rd.; Sat. 12-5, Sun. 12-5; free admission; contact Russell Brarens, 515 Lincoln Blvd., Middlesex, NJ 08846, (908) 421-1045; Email: njmin515@gmail.com; Website: www.njmin.org

2-3—STURTEVANT, WI: Racine Geological Society; Fountain Banquet Hall; Sat. 10-5, Sun. 10-4; free; Website: www.racinegeologicalsociety.weebly.com

2-3—RIDGECREST, CA: Indian Wells Gem & Mineral Society; Desert Empire Fairgrounds; Daily 9-5; free; Website: <https://indianwellsgemandmineral.com>

2-3—MIDLAND, TX: Midland Gem & Mineral Society; Barbara & George H. W. Bush Convention Center; Sat. 9-6, Sun. 10-5; \$7, ages 6-18 \$3, under 6 free; Website: www.midlandgemandmineral.org

8-10—HUMBLE, TX: Houston Gem & Mineral Society; Humble Civic Center; Fri. & Sat. 10-6, Sun. 10-5; \$8 under 11 free; Website: <https://hgms.org>

8-10—PUYALLUP, WA: Gem Faire Inc.; Washington State Fair & Events Center; Fri. 12-6, Sat. 10-6, Sun. 10-5; \$7, under 12 free; Website: <http://www.gemfaire.com>

8-10—PASCAGOULA, MS: Mississippi Gulf Coast Gem & Mineral Society, Inc.;

Jackson County Fairground Community Center; Fri. & Sat. 10-6, Sun. 10-5; \$3, under 13 free; Website: www.mgcgms.org

8-10—GRAY, TN: Kingsport Gems & Minerals Society; Appalachian Fairgrounds; Fri. & Sat. 10-6, Sun. 12-5; \$3, students \$1, under 7 free; Website: <https://www.facebook.com/kgmsociety/>

9—MOUNTVILLE, PA: Lancaster County Fossil & Mineral Club; Trinity United Church of Christ; Sat. 9-4; \$3; Website: <https://www.facebook.com/LancasterFossilandMineralClub>

9-10—EDMONDS, WA: Maplewood Rock & Gem Club; Maplewood Rock & Gem Clubhouse; Sat. 9-5, Sun. 10-5; free; contact Mary Ann Collins, (206) 714-3922; Email: collmal@comcast.net

9-10—YUBA CITY, CA: Sutter Buttes Gem & Mineral Society; Yuba/Sutter Fairgrounds; Sat. 10-5, Sun. 10-4; free; Website: <https://sutterbuttesgemmin.org>

9-10—FREEPORT, IL: North West IL. Rock Club; Highland Community College; Sat. 9-5, Sun. 10-4; free will donation; Website: nwilrockclubfrpt.blogspot.com

9-10—SEDRO WOOLLEY, WA: Skagit Rock & Gem Club; Sedro Woolley Community Center; Sat. 9-5, Sun. 10-4; free; Website: <https://www.skagitrockandgem.com/>

9-10—OLYMPIA, WA: Crystallography Gem + Mineral Market; The Olympia Center; Sat. 11:30-5:30, Sun. 11-5; \$1, under 12 free; Website: www.crystallographygems.com

15-17—GOLDEN, CO: Denver Area Mineral Dealers; Jefferson County Fairgrounds; Fri. & Sat. 10-5, Sun. 11-4; free; Website: <https://www.facebook.com/denverareamineraldealers/>

15-17—PORTLAND, OR: Gem Faire Inc.; Oregon Convention Center; Fri. 12-6, Sat. 10-6, Sun. 10-5; \$7, under 12 free; Website: <http://www.gemfaire.com>

16-17—SHORELINE, WA: Crystallography Gem + Mineral Market; Shoreline Community College; Sat. 10-6, Sun. 10-5; \$2, under 12 free; Website: www.crystallographygems.com

16-17—LEBANON, PA: Mid-Atlantic Gem & Mineral Association; Lebanon County PA Fairgrounds & Expo; Sat. 10-5, Sun. 11-4; \$5, under 12 free; Website: www.gemshow.com

16-17—LAKESIDE, CA: El Cajon Valley Gem & Mineral Society; Lakeside Rodeo Grounds; Sat. 10-5, Sun. 10-4; free; Website: <https://www.ecvgms.org>

16-17—SANTA CRUZ, CA: Santa Cruz Gem & Mineral Society; Live Oak Grange; daily 10-5; Website: [srockngem.org](http://www.srockngem.org)

16-17—HESPERIA, CA: Mining Supplies & Rock Shop; Mining Supplies & Rock

Shop; Sat. 9-5, Sun. 9-4; free; Website: miningsuppliesandrockshop.com

22-24—WEST JORDAN, UT: Rockhounds Outreach for Community Knowledge (R.O.C.K.); Viridian Library & Event Center; Fri. & Sat. 10-7, Sun. 10-5; \$2, under 12 free; Website: <http://www.rockhoundsrock.com>

22-24—COSTA MESA, CA: West Coast Fall Gem, Mineral & Fossil Show; Hilton Orange County/Costa Mesa; Daily 10-6; free; Website: www.mineralshowslld.com

22-24—COLUMBIA, SC: The Columbia Gem & Mineral Society; Jamil Temple; Fri. & Sat. 10-6, Sun. 12-5; \$5, free; Website: www.cgms.rocks

22-24—CRESTWOOD, KY: KYANA Geological Society; Camp Crestwood; Fri. & Sat. 10-5, Sun. 12-4; free; Website: www.kyanageo.org

23-24—MESQUITE, TX: Dallas Gem & Mineral Society; Mesquite Rodeo Center; Sat. 10-6, Sun. 10-5; \$8, under 5 free; Website: www.dallsgemandmineral.org

23-24—WEST PALM BEACH, FL: Gem & Mineral Society of the Palm Beaches; South Florida Fairgrounds Expo Center East; Sat. 9-6, Sun. 10-5; \$9, under 12 free; Website: www.gemandmineralsociety.org

23-24—FAIRFAX, VA: The Northern Virginia Mineral Club; George Mason University; Sat. 10-6, Sun. 10-4; 6, under 13 free; Website: www.novamineralclub.org

23-24—OXNARD, CA: Oxnard Gem & Mineral Society; Oxnard Performing Arts Center; Sat. 10-5, Sun. 10-4; free; Website: www.oxnardgem.com

23-24—WORCESTER, M: Worcester Miner Club Show; National Guard Armory; Sat. 9:30-5, Sun. 10-4:30; \$6, under 13 free; Website: www.worcestermineralclub.org

November 2019-December 2019

30-1—SAN FRANCISCO, CA: Pacific Crystal Guild; San Francisco County Fair Bldg.; Sat. 10-6, Sun. 10-4; \$12, under 13 free; Website: <http://www.crystalfair.com>

30-1—MONTEREY, CA: Gem Faire Inc.; Monterey County Fairgrounds; Sat. 10-5, Sun. 10-4; free; Website: <http://www.gemfaire.com>

30-1—WICKENBURG, AZ: Wickenburg Gem & Mineral Society; Hassayampa Elementary School; Sat. 9-5, Sun. 10-4; free; Website: <http://www.wickenburggms.org/>

Sunshine Requests

If you know someone who could use a little sunshine— birth, illness, surgery, family death—please contact Christi Higgins at 320-224-6650.



New Frozen Dragon



In the icy badlands of Alberta, paleontologists have found a “frozen dragon”: a new genus of pterosaur that once soared over the heads of dinosaurs with a wingspan that stretched at least 16 feet. The flying reptile—named *Cryodrakon Boreas*—lived in what is now western Canada about 76 million years ago, during what’s known as the Cretaceous period.

For a long time, paleontologists had assumed that the fossils belonged to a pterosaur called *Quetzalcoatlus northropi*, says study coauthor Dave Hone, a paleontologist at Queen Mary University of London. Both animals belong to a group known as the azhdarchid (azh-DAHR-kid) pterosaurs, which were notable for being mostly head and neck.

The azhdarchids are also known for reaching immense sizes, none more so than *Quetzalcoatlus*. When flying over what’s now Texas, its wingspan stretched more than 30 feet. When it was walking on ground, as azhdarchids often did, it was more than eight feet tall at the shoulder, roughly the same height as some giraffes.

The partial skeleton that defines *Cryodrakon* was dug up from Canada’s Dinosaur Provincial Park in 1992. But its identity remained unclear for decades because of a paleontological paradox: *Quetzalcoatlus* might be the best-known and worst-known azhdarchid all at once.

Though *Q. northropi* was described in 1975, only one of its limb bones got a detailed writeup; the scientists who oversaw the giant’s remains never got around to publishing the rest. For 40 years, paleontologist Wann Langston worked off-and-on to complete the description—but then he died in 2013, leaving the work unfinished.

In the meantime, North American paleontologists have been caught in a catch-22. If they found pieces of what looked like a large Cretaceous azhdarchid, they provisionally assigned them to *Quetzalcoatlus*,

because they didn’t know enough about *Quetzalcoatlus* to say anything different. “You’ve got this weird situation where *Quetzalcoatlus* is basically the first azhdarchid to be named, so it becomes the definition of the [group], and yet there’s no good description of it,” says Hone, who describes the situation as “a giant loop of not being able to solve the problem properly.”

In the past 15 years, paleontologists have found more types of azhdarchids in France, Morocco, Kazakhstan, Hungary, Romania, and elsewhere, giving a much better reference for diversity within this pterosaur group. In addition, a small number of researchers have since gotten the chance to see the *Quetzalcoatlus* fossils up close—including Habib, who measured the bones to model how the creature flew.

As a point of comparison, Habib visited Canada’s Royal Tyrrell Museum to see the partial pterosaur skeleton dug up in 1992, whose limb bone is among the best preserved in the world.

The remains first gained notoriety for their scars. The bones bear scratches and an embedded tooth that appear to be from a scavenger, most likely a relative of *Velociraptor*. But Habib soon saw more intriguing features. The more that he compared his measurements of *Quetzalcoatlus* to the Canadian fossil, the more he suspected it wasn’t *Quetzalcoatlus* at all.

Because the Canadian remains make up a partial skeleton, Habib’s colleague Hone had enough material to place the pterosaur on the azhdarchid family tree. He then zoomed in on the neck vertebra, whose ends are shot through with pneumatophores, the holes through which air sacs once entered the bone’s interior.

The arrangement of these pneumatophores can help scientists tell pterosaur species apart. And when Habib, Hone, and Royal Tyrrell Museum paleontologist François Therrien compared the holes in the Canadian pterosaur’s neck vertebrae against those for all other known azhdarchids, they found that its arrangement is unique.

To recognize the modern climate in the region where this pterosaur once roamed, they named the new pterosaur *Cryodrakon Boreas*, or “the cold dragon of the north winds.”

The main reference fossil for *Cryodrakon* belonged to an individual pterosaur that had

a roughly 16-foot wingspan. But the researchers realized that a separate fossil at the Royal Tyrrell Museum—a smashed-up tube of bone 16 inches long—was the middle portion of a neck vertebra from an azhdarchid that probably had a wingspan of more than 30 feet.

With its ends broken off, that vertebra had avoided identification for years: Paleontologists had even once tentatively described it as a leg bone. Because the fossil is fragmentary, researchers can’t say for sure whether it belongs to *Cryodrakon*, but the neck vertebra is definitely from an azhdarchid, and *Cryodrakon* is now the only known azhdarchid from that place and time.

“There is a 9- to 10-meter wingspan azhdarchid in this formation; whether or not that’s exactly the same as the one we’ve described, you can’t say 100-percent,” Hone says. “It’s like you go out to Africa, and you find some giant cat tooth—it’s probably a really big lion, but without the rest of the lion attached to it, it’s a tooth!”

Martin-Silverstone agrees with the cautious approach: “I think they’re right that it’s an azhdarchid [neck] vertebra—I’ve seen this specimen, and I completely agree that that’s what it is,” she says. “But I would be much more conservative in saying it’s *Cryodrakon*, because, yeah, there’s no features on that at all.”

More work on *Cryodrakon* may help crack the mystery and add more clues to this large pterosaur’s lifestyle. Habib, for one, still wants to use the limb measurements to calculate how it flew—the project that inadvertently turned up the frozen dragon in the first place.

Future analyses could even peer deeper inside the pterosaur’s bones. Taissa Rodrigues, a paleontologist at Brazil’s Federal University of Espírito Santo who wasn’t involved with the study, says that taking thin sections of *Cryodrakon* bones could reveal how the pterosaur grew from hatching to adult. Future fossils, she adds, could even test whether *Cryodrakon* varied in size based on sex.

“It’s amazing,” she says, “just to see how far we’re going.”

<https://www.nationalgeographic.com/science/2019/09/cryodrakon-new-frozen-dragon-pterosaur-found-hiding-in-plain-sight/>



Shale is the most abundant sedimentary rock in the world. In fact, it makes up about 70 percent of all sedimentary rock in the Earth's crust.

Cuyuna Rock, Gem & Mineral Society Board Meeting Minutes Saturday August 19, 2019

The meeting was called to order by President Ed Opatz at 12:25 pm. Present were: President Ed Opatz, Treasurer Kevin Martini, Secretary Joanie Hanson, and Board Members-at-Large Vern Iverson, Lori DuBois and Lilly Peterson.

A motion was passed to approve the minutes from the July meeting.

Elections are in November. Terms that are up are President, Secretary and the three Board Member-at-Large positions. An election committee consisting of Kevin Martini and Lisa Hughes will take names of club

members interested in running for office.

Ed is looking at different auction houses to possibly sell the rock collections currently at the rock club.

Treasurer's Report: Kevin Martini- will be posted at the rock club.

A motion was passed to pay the bills for the month.

Ed is pricing out two 8ft. tables to replace the ones that went missing after the show.

A motion was passed to approve Emily Day registration for Dave Moe.

Joanie brought up the concern of how to handle answers to email questions such as "where can I pick rocks?" or "what kind of

rock is this?". The general response will be to invite them to our meetings.

Joanie will again be working with Jim Reed to correct some issues with the website.

Joanie is working on getting the record - keeping for the club up to date.

Ed will talk to building management about the bathroom door lock.

Ed will talk to Julie about the decision to do the fall holiday day show.

Housekeeping- We all need to help keep our club space clean and neat.

Respectfully submitted,
Joanie Hanson, Secretary

Rock Room

This Club is unique because it has its own rock store. Here is an inventory of what is available for Club members to purchase. Stop in when you come to the Clubhouse.

Grit and Polish	Montana Petrified Wood
Montana Moss & Blue Agate	
Oregon Geodes	Chalcedony
Desert Rose	Plume Agate
Yellow Jasper	Bruno Jasper
Owyhee Picture Jasper	
Brazilian Agates	Amethyst
Tee Pee Canyon Agate	
Hauser Bed Agate Thundereggs	
Slabs of all sizes and types	
Septarian Nodules—Utah	
79 Bed Geodes—Oregon	
Moroccan White Agate	
Obsidian	Mineral specimens
Dinosaur bone	Condor Agate
Mexican Luna Lace Agate	
Starolites (Cross Rocks)	
Small Botswana Agate	
Rocks from the Moes' collection	
New material will be available soon from a recent donation.	

Famous Pearls in History

With its long, 500-year history, the La Peregrina Pearl is one of the most famous pearls in the world. In the mid-16th century, the pearl was found off the coast of Santa Margarita, a Spanish colony, in the Gulf of Panama. Phillip II of Spain then gifted the pearl to Mary I of England before their marriage. Upon the Queen's death in 1558, it was returned to the Crown of Spain where it remained for the next 250 years and was worn by multiple Spanish royals on special occasions and for their official portraits.

In 1808, the older brother of Napoleon, Jo-

seph Bonaparte became the King of Spain. He ruled for five years until the French forces were defeated at the Battle of Vitoria and he was forced out of the kingdom. As he fled, Bonaparte took some of the crown jewels, including La Peregrina Pearl. The pearl was then left to Napoleon III, who, after his exile to England in the 1870s, sold the pearl to James Hamilton, Duke of Abercorn.

In 1969, the Hamilton family sold the pearl at a Sotheby's auction in London. Actor Richard Burton was the winning bidder, nabbing the pearl for a mere \$37,000 USD. Burton gifted the pearl to his wife Elizabeth

Taylor as a Valentine's Day gift to feed her fine jewelry collection. Taylor later commissioned Cartier to re-set the Peregrina Pearl in a necklace outfitted with rubies, diamonds, and even more pearls.



In 2011, Elizabeth Taylor's estate was posthumously auctioned by Christie's and the Peregrina Pearl necklace sold for over \$11 million USD.

<https://www.truefacet.com/guide/lustrous-luxurious-worlds-expensive-pearls/>

Mineral Encyclopedia



Marcasite is a yellow to silvery-yellow iron sulfide mineral with a chemical composition of FeS_2 . It forms by precipitation from acidic waters in

surface or near-surface environments.

Marcasite is commonly found in sediments, sedimentary rocks, and hydrothermal deposits in many parts of the world. Marcasite has historically been used as a source of sulfur; however, today it does not have any significant industrial use.

Marcasite is similar to pyrite in appearance and physical properties, and it has the same chemical composition. However, the two minerals differ in crystal structure. Pyrite crystallizes in the isometric system, while marcasite is orthorhombic.

The most important difference between pyrite and marcasite is their difference in stability in the surface and near-surface environment. Marcasite is much more reactive than pyrite, & it alters at a much more rapid rate. Marcasite will tarnish rapidly when exposed to the weather & will even tarnish in the specimen drawers of a classroom.

When stored in a location with moderate humidity, marcasite specimens can alter to form ferrous sulfate minerals. In the presence of moisture or humidity, these sulfate minerals can produce small amounts of sulfuric acid that can damage specimen notecards, specimen boxes, and adjacent specimens. The reaction can discolor the wood or cause rusting of the drawers of a specimen cabinet. Marcasite specimens should be stored where humidity can be controlled and where any alteration will not cause damage.

People who have experience with pyrite and marcasite hand specimens can often tell them apart solely on the basis of their color or tarnish. However, crystal form, if observable, provides a conclusive separation. The streak of pyrite can be slightly greenish while marcasite is a pure gray.

In reflected light microscopy of polished coals and ore specimens, marcasite will have a noticeably whiter color than the brass yellow of pyrite, although inexperienced observers might see them side by side and assume that both are pyrite. The conclusive text is observation under crossed polarizers when marcasite can produce interference colors of green, blue, and reddish

brown.

Most marcasite forms in one of three ways: 1) as a primary sedimentary mineral; 2) as a product of low-temperature hydrothermal activity; and, 3) as a secondary mineral that forms during the alteration of other sulfides such as pyrrhotite or chalcopyrite. Most conditions of marcasite formation are at relatively low temperatures and elevated acidity.

Marcasite has an economic significance when it is found in coal. It contributes to the sulfur dioxide emissions during the combustion of coal. When coals are analyzed for their sulfur content, they are often leached in the lab with nitric acid. The amount of sulfide mineral in the sample is estimated by calculation based upon the amount of dissolved iron in the nitric acid leach. The result is reported as "pyritic sulfur" - which disregards that some of the iron might have been contributed by marcasite. Most coal seams contain very little marcasite, but in some coal seams marcasite can be the dominant sulfide mineral and primary source of sulfur.

Marcasite can form in organic-rich clays and peats during their sedimentation or during diagenesis. The organic debris in these sediments produces a slightly acidic environment that is conducive to the formation of sulfide minerals. Pyrite is the more common sulfide to form, but this is also a common environment of marcasite.

In clays and limestones, pyrite and/or marcasite often form in the microgeochemical environments that surround fossils or pieces of organic debris. Occasionally entire fossils are replaced by pyrite and rarely marcasite. In hydrothermal deposits, marcasite can be one of many sulfide minerals to be deposited along veins and fractures. Hydrothermal marcasite is often associated with pyrite, pyrrhotite, galena, sphalerite, fluorite, dolomite, or calcite.

Until the early 1800s, many people used the word "marcasite" and its foreign equivalents collectively for pyrite, marcasite and other yellow iron sulfide minerals. It was not until 1845 that marcasite was recognized as an orthorhombic iron sulfide and different from pyrite.

Pyrite is widely known because of its nickname of "fool's gold." Pyrite is also a "ubiquitous" mineral, meaning that it is "found everywhere." By comparison, marcasite is much less common and not as widely recognized by people who study rocks. Because of this many people

have seen marcasite in the field and assumed that it was pyrite, a much more common, much more probable, and much more front-of-mind mineral.

"Marcasite" jewelry is occasionally encountered for sale today, but it was much more popular in Victorian and Art Nouveau designs of the late 1800s and early 1900s. Much of this jewelry was not made with marcasite. Instead, most was made with pyrite or imitation "gemstones" made of metal. Mineralogical marcasite is almost unknown in this jewelry even though the name "marcasite" is used for it.

True marcasite is a poor choice for jewelry because it is brittle and chemically unstable. It tarnishes quickly and sometimes alters to sulfate minerals which can be corrosive when exposed to moisture or humidity.

Marcasite has been used in the past as a minor source of sulfur and for making sulfuric acid. Today, marcasite does not have any significant industrial use.

<https://geology.com/minerals/>

Physical Properties of Marcasite

Chemical Classification Sulfide

Color Pale bronze yellow to silvery yellow on fresh surfaces; however, marcasite tarnishes easily and specimens will alter to a brownish color over time even in an office environment.

Streak Dark gray to black

Luster Metallic when fresh, submetallic after tarnish.

Diaphaneity Opaque

Cleavage Poor

Mohs Hardness 6 to 6.5

Specific Gravity 4.8 to 4.9

Diagnostic Properties Color, crystal form

Chemical Composition Iron sulfide, FeS_2

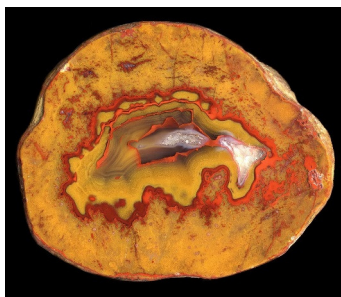
Crystal System Orthorhombic

Uses A historical source of sulfur. Some gemstones and jewelry items are reported to be made of marcasite, but most of these are actually pyrite or made from a metal with a similar appearance.

Cuyuna Rock, Gem, & Mineral Society on the Web

www.cuyunarockclub.org





Agates From Around The World

Paint Rock Agates

*Paint Rock Valley/Cumberland Plateau along
Alabama & Tennessee border*

The yellow agates with red freckles and ribbons look like they have been crazily painted by dancing painters and they were first found at Paint Rock Valley, Alabama as floaters. Apparently, they had been weathered from the limestone beds at Greasy Gove, Tennessee which is a few hundred feet from the Alabama-Tennessee border. A small percentage of the Paint Rock Agates will contain banded agates and even fewer will have the banded agates centered in the nodules. The agates are yellow, orange, and red, sometimes with black to clear agates and the red color are usually not confined to the bands due to the porosity of the agates.

It seems quite difficult to obtain any quality banded agates from those areas due to the fact that so much of the land are privately owned, but there are been some collecting expeditions to the rivers and lumbered areas. Several old claims opened in 1950s-1960s had produced some excellent specimens.

The best agates along Alabama/Tennessee border look like they have been extracted directly from limestone host itself and the nodules have reddish tint. Most will show yellow dots/ribbons with red color without any agate banding.

Tennessee Paint Rock Agates are similar, but has rougher & more weathered exteriors. Coming from close locations along the border, they can be confused with each other if not labelled properly.

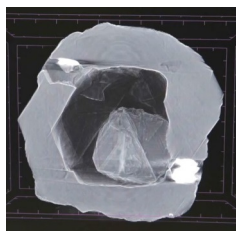
<http://www.sailorenergy.net/Agates/AgatesAlabamaPaintAgates01.html>

One of a Kind Diamond

An extraordinary diamond unearthed in Russia definitely lives up to the ultra-rare tag, being the only such example ever discovered. It is a diamond with another diamond that moves freely inside it, earning it the name the Matryoshka diamond for its resemblance to traditional Russian nesting dolls.

The unusual diamond was discovered during a sorting process in Nyurba, a mining town in eastern Russia. The outer diamond measures just 4.8 x 4.9 x 2.8 mm, & its internal cavity is 6 cubic mm. The tabular-shaped internal diamond bouncing around in this cavity measures 1.9 x 2.1 x 0.6 mm, & has a volume of 1.6 cubic mm. The diamond weighs a total of 0.62 carats, with the internal diamond estimated to account for 0.02 carats of this.

Scientists working in the Research and Development Geological Enterprise of Alrosa, the partially state-



owned diamond company that runs the Nyurba diamond mine, have subjected the Matryoshka diamond to various analyses, such as infrared & Raman spectroscopies, & X-ray microtomography, & estimate it may be over 800 million years old. As for how it formed, they have a couple of ideas to explain how the internal diamond came first & was subsequently encased in the external one.

“We have two main hypotheses,” says Alrosa’s Oleg Kovalchuk. “According to the first version, a mantle mineral captured a diamond during its growth, & later it was dissolved in the Earth’s surface. According to the second version, a layer of porous polycrystalline diamond substance was formed inside the diamond because of ultra-fast growth, & more aggressive mantle processes subsequently dissolved it. Due to

Precious or Semi-Precious Gemstones



Topaz is a silicate mineral with the chemical formula $\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$. It belongs to the orthorhombic crystal system and has a Mohs hardness of 8. Topaz may be colorless or nearly any color, depending on impurities.

<https://www.thoughtco.com/alphabetical-list-of-precious-and-semiprecious-gemstones-4134639>



We're on Facebook!
***Cuyuna Rock,
Gem & Mineral Society***

is a closed group, so you must ask to join. After being approved you can follow the members' posts and add your own information.

the presence of the dissolved zone, one diamond began to move freely inside another on the principle of matryoshka nesting doll.”

Neither cavities of inclusions, which is the name given to internal defects, such as structural imperfections, foreign material or another diamond crystal, are uncommon in diamonds. But while they usually lower the value of the diamond, the diamond inclusion able to move freely around the cavity inside the Matryoshka diamond is likely to have the opposite effect due to its apparent uniqueness.

“As far as we know, there were no such diamonds in the history of global diamond mining yet,” says Kovalchuk. “This is a unique creation of nature, especially since nature does not like emptiness. Usually, some minerals are replaced by others with out cavity formation.”

<https://newatlas.com/materials/matroyoshka-diamond-inside-diamond-discovered-russia/>

Jewelry Making Tip

By Brad Smith

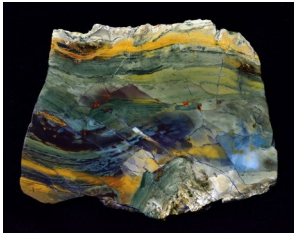
www.BradSmithJewelry.com

Heat Proof Bench Surface

An inexpensive and very effective heat proof surface for a soldering area or casting bench can be made using a building material called Hardie Backer Board. It is a fiber reinforced cement sheet that is typically used as a waterproof base for ceramic tiles in bath tubs and shower stalls.

It is available from lumber yards and home fix-it stores. Cutting it is easiest with a masonry blade on a circular saw. Be sure to wear a mask and use eye protection while sawing.

The World of Jaspers Morrisonite Jasper



Morrisonite jasper is actually labelled as the king of jaspers. It is a part of the porcelain jasper group and has grown fairly

rare—in comparison to some other jasper stones. Further, it's first discovered in the year 1974 at one ranch in the Owyhee desert in Idaho USA.

Moreover, the stone garnered its title of being a porcelain jasper because of its round-like patterns and rare swirls. Further, it also has the capacity to attain a high shine, as well as polish that gives it a ceramic appearance.

Furthermore, this gemstone is made up of chalcedony with iron and aluminum inclusions, which are actually responsible for its own beautiful colors. Each of the morrisonite jasper stone is distinct. Once it is cut into a cabochon or bead, it may also appear in a liquid form.

The most notable locations of the morrisonite are Mexico and Madagascar. However, it may also be found in various countries worldwide.

<https://gemstagram.com/facts-about-morrisonite-jasper-meanings-properties-and-benefits/>

Cuyuna Rock, Gem & Mineral Society General Meeting Minutes Saturday August 10, 2019

The meeting was called to order at 2:00 pm by President Ed Opatz.

29 members were present.

The September meeting is cancelled due to the rock club trip being that weekend.

The winner of the show card prize- a beautiful amethyst geode, was present to receive her prize. Congratulations to Nancy Kazlauckas.

The election committee was set up for elections in November (Kevin Martini, Lisa Hughes). Terms coming due are: President, Secretary, and the three Board Member-at-Large positions. If you are interested in becoming a board member please let either Kevin or Lisa know.

Treasurer's report: Kevin Martini- will be posted at the rock club.

Rock show and Kid's camp wrap up- both were very successful and numbers will be posted in the treasurer's report.

We are looking at ideas for next years' show. Ed suggested doing a rock pile laced with agates and other minerals for the kids to dig in. He will check on the feasibility of doing this and the possibility of donating the rock to the fairgrounds afterwards. Tabled for now.

Ed is looking into what it would take to change the rock picking laws on state lands and parks.

Rock club fall trip update: We will meet in Kadoka South Dakota on Sept. 14. any questions- call Ed Opatz.

There will be a morning pick at the Blanchard Dam for staurolites on Sunday 8/11 at 9:00 am.

The spinning wheel will be at the Outing show 8/17/19 and the McGregor show 8/31/19. Any help is appreciated.

Door prize winners were: Dan Hammond, Justin Reisz, Anna Bankey, Steve Moening, and Ghyri.

Respectfully submitted,
Joanie Hanson, Secretary

Rox Box

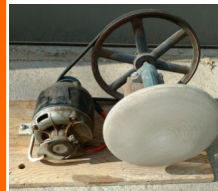
A place to advertise rock items to sell and to inquire about items to purchase.



The Cuyuna Rock, Gem & Society accepts no responsibility for any dissatisfaction that may occur by either party, seller or buyer. The Society does not profit in any way by sales transactions.

For Sale:

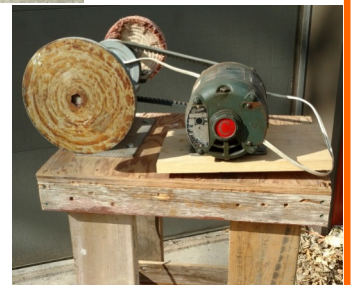
Double barrel Lot-O Tumbler in good condition. On cement block for stability. \$175.



For Sale: Finish polish wheel with brand new leather. \$110.



Buffer/Polisher in fair condition. Includes wood stand. \$65.



All three can be seen at the Clubhouse.

Call Ed Opatz at 320-250-1363.

For Sale:

Rock Drilling System Like new condition. Includes 3 speed drill press, coolant delivery system, 3 spare nozzles, maple drilling block, 8 oz. bottle diamond lube, stainless steel magnetic base coolant recovery/ splash tray, adjustable mini-vise, 6 piece diamond drill bit assortment. \$200. Call Bev Williams at 218-821-5684.

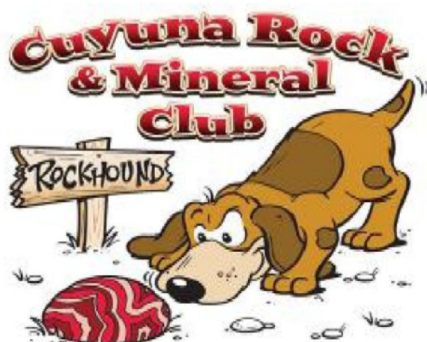


For Sale: A variety of lapidary equipment, including tumblers, flat laps, rock saws (10-20" blades), automatic cabbing machine, 4 wheel cabbing machine, saw blades. Call Ed Opatz at 320-250-1363.

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FIRST CLASS MAIL

NOVEMBER



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Members of AFMS & MWF



Notes from the President

Club member, Lyndon Johnson, will be featured on the television show Minnesota Bound, Kare 11 (NBC) on Sunday, November 24 after the 10 p.m. news. It will repeat on Saturday, November 30 at 6:30 p.m. Hopefully you can check out Lyndon and his great collection of Lake Superior agates.

If you have been to the Clubhouse lately, you have noticed that we are overflowing with rocks. The Board decided to have a live auction in conjunction with Sample's Agate, Gem & Mineral Show in Brainerd on January 4. More information and flyers are available. In order to get ready for this event we will need help preparing flats. Here are the Saturdays we are looking for help: November 2, November 23, December 14, December 21. Of course we will need help on the day of the auction too.

The programs for January and February will be learning how to use the shop equipment. If you have specific rocks you would like to work, bring them, or you can buy something from the rock room.

We'll be having our annual potluck Christmas party on Saturday, December 14th. I'm already getting some white elephant gifts together for our famous game!



Ed Opatz

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