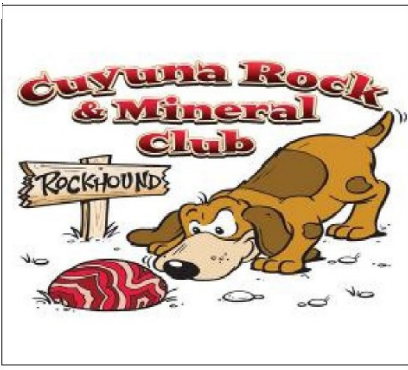


# The Agate Explorer

## December 2023



**IT'S TIME!**



**DON'T DELAY, RENEW YOUR MEMBERSHIP TODAY!**

### *Dues are due!*

*The yearly dues of \$20 per household are due. Please pay online at [www.cuyunarockclub.org](http://www.cuyunarockclub.org), bring it to a meeting (if you are paying cash, PLEASE put it in an envelope with your name on it, so your account will be credited), or mail it to:*

*Cuyuna Rock, Gem, and Mineral Society,  
1001 Kingwood St., Ste. B-40  
Brainerd, MN 56401.*



*Franklin Art Center*

### **Club Information**

Website-[www.cuyunarockclub.org](http://www.cuyunarockclub.org)  
Email-[cuyunarockgemclub@gmail.com](mailto:cuyunarockgemclub@gmail.com)

#### **Meeting Place**

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

#### **Directions**

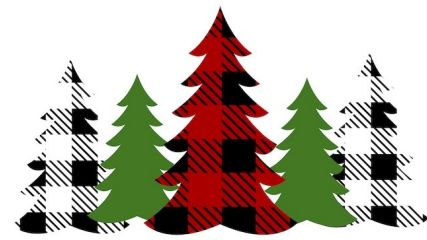
.4 mile east of Business Hwy. 371 & Hwy. 210 intersection.  
(Castle turret water tower.)

#### **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.**



### **December Meeting Party** **Saturday, December 16**

**10:00—Decorating for party**  
**12:00 noon—Potluck party and White Elephant Gift Game**  
**Brief general and Board meetings to follow**

**Bring one or more wrapped gifts (anything goes!) for the white elephant gift dice game. Let the merriment and chaos begin!**

**Please email Marcia Opatz—[theisma@hotmail.com](mailto:theisma@hotmail.com)—or text 320-250-8120 to let her know what you are bringing. Periodically an email will be sent out with an updated list.**

### **Looking For Food Truck**

for the weekend of the 2024 Cuyuna Rock Show, May 11-12. We already have a long-time food vendor, Butts & Buns BBQ secured, and are looking for another vendor with totally



different food from that business.

If you find a food vendor who is willing to work the show, please contact Ed Opatz at 320-250-1363.

### **Club Calendar**

- January 13**—meeting date, speaker Jon Hellerman on taking photos of rock specimens
- February 10**—meeting date, speaker Steve Huber on rock carving
- March 9**—meeting date
- April 13**—meeting date

**Information subject to change.**



#### **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.**

**Cuyuna Rock, Gem & Mineral Society**  
**Meeting Minutes**  
**Saturday, October 14, 2023**

**Board Meeting**

The meeting was called to order at 12:15 p.m. by President Ed Opatz. Present were Vice-President Lori DuBois, Treasurer Kevin Martini, Secretary Joanie Hanson, and board members-at-large Vern Iverons and Jo Schwalboski.

A motion was passed to approve the minutes for the September meeting.

Treasurer's Report—The full report will be posted at the rock club. A motion was passed to pay the monthly bills.

Club clothing update—Vern purchased and delivered the new sweatshirts and t-shirts for the Club. Kevin reimbursed him for the cost. Posted in the treasurer's report.

Clothing sales slips—Marcia created sales slips that we will use when we sell clothing to members. This will enable us to keep better track of sales.

Rock Show—Table rentals—we are looking at new places to rent tables for the show. The place we were renting from has closed. We have a security training session on the Friday evening before the rock show, given by Gwen Martin. Ask people that will be volunteering on security, as well as vendors, to be present for training Friday evening.

Rock Activities—Open day—Saturday, October 28th, 9-2. Dan Hammond will deep clean the small rock saw.

Need Competency training test for all club machine use.  
Information for Mat on past presidents. We will be deep diving into the Club archives and organizing them.

Someone from the U of M Duluth Geology

Dept. will pick up the large rock specimens.

November 18th, 10-2—Holiday open house and rock club holiday sale—advertising?

Halloween—4-6:30 p.m. We will give out rocks, of course.

**General Meeting**

The meeting was called to order at 2:05 p.m. by President Ed Opatz. 28 members and 1 guest were present.

Treasurer's Report—will be posted at the rock club.

Elections and silent auction, next meeting—please consider running for office.

Machine use competency training—need someone to be in charge of this.

Show security training—see note from Board meeting above.

October 28—open club—3 people signed up.

November 18—10 a.m. to 2 p.m., Franklin Holiday Open House/ Rock club holiday agate show/sale. Need spinning wheel and geode cracker workers. Need to know who will be vending.

Reminder—Holiday/Christmas party is December 16, Club opens at 10, eat at noon. Potluck—let Marcia know what you will bring for food. White elephant gift exchange.

Door prize drawing—winners—Jo Schwalboski, Sherry Moening, Keith Lorensen, Dan Hammond, Whitney Olson.

Speaker—Jim Magnuson on cabochon making.

Respectfully submitted,  
Joanie Hanson

water seeped through the basalt and formed greenstone.

The islands collided with the small continent and crumpled into mountains at the seam. Much later another collision created a second mountain range. Gneiss (pronounced "nice") and granite rocks formed deep beneath the mountains. The mountains eventually wore down, exposing the rocks.

At the same time, Minnesota's iron ore deposits formed from volcanic sediments at the bottom of the sea.

The earth's continents are still moving.

[https://files.dnr.state.mn.us/mcvmagazine/young\\_naturalists/young-naturalists-article/rocky\\_roots/rocky\\_roots.pdf](https://files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/rocky_roots/rocky_roots.pdf)

**November Birthstone**  
**Topaz**



Most blue topazes come out of the earth colorless or pale blue. A two-step heat and radiation laboratory treatment is then used to turn these stones vivid greenish blue. Blue topazes are not only beautiful but inexpensive.

Through the ages, topaz has been popularly associated with wealth. This is likely due to its more common yellow color, which led some to believe that topaz had the mystical ability to attract gold.

Blue topaz are referred to by trade names such as "London Blue," "Swiss Blue," and "Sky Blue." London Blues have a dark steel blue or grayish blue color. Swiss Blues show a highly saturated greenish blue. Sky Blues show pale blue colors and may somewhat resemble aquamarines in hue and tone.

Blue Topaz was first discovered in the Greek Islands, Topazios in the Red Sea by the Romans more than two thousand years ago. Now natural blue topaz is found in the state of Texas in the United States of America, and in the Ural Mountains in Russia. Brazil, Sri Lanka, Nigeria and China also produce blue topaz.

Blue topaz registers 8 on the Mohs scale, making it harder than sapphire and tougher than tanzanite. Blue topaz is however brittle and should be handled with care.

<https://www.gemsociety.org/article/birthstone-chart>

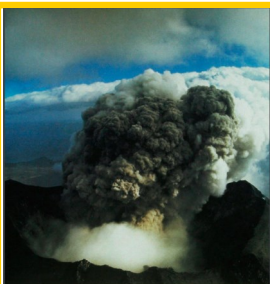


**Arizona State Fossil**

**Fossil: Arkansaurus Fridayi**  
**Age: Early Cretaceous**  
**Year Designated: 2017**

Arkansaurus, a bipedal coelurosaurian dinosaur, is the only dinosaur whose remains have been found in Arkansas. Joe B. Friday discovered the dinosaur's fossilized foot in a gravel pit near Lockesburg in 1972 when he was out looking for a cow.

<https://www.fossilera.com/pages/state-fossils>



**Building a Continent**

A few billion years ago, the only life on earth was single-celled bacteria. Continents were much smaller than they are today.

They moved around slowly and grew whenever they collided with islands or each other.

Scientists believe northern Minnesota was a chain of volcanic islands near the edge of a small continent. When the volcanoes erupted, red-hot lava flowed into the sea. The lava cooled and hardened into pillow-shaped black rock called basalt. Later, warm sea



## New Species of Big-Thumbed Dinosaur Discovered in Mongolia

Preserved in a resting pose for more than 70 million years, a new species of dinosaur has finally been brought to light.

Named *Jaculinykus yaruui*, or the ‘speedy clawed dragon’, the small, possibly feathered, dinosaur was well adapted to dashing around what is now Mongolia. With hands dominated by a large thumb, it could have dug into insect colonies in the search for food.

Sometime during the Late Cretaceous, however, the luck of one particular *Jaculinykus* ran out. Settling down to sleep in a pose similar to modern birds, it was rapidly buried under sand. This preserved it for millions of years until it was discovered by paleontologists in 2016.

Kohta Kubo, a PhD student and lead author of new research describing the new species, says, ‘As most of *Jaculinykus*’ skeleton has remained in its original position, it could have been buried rapidly during a sandstorm or a catastrophic event.’

‘Alternatively, it’s possible that it was buried while in a burrow. Alvarezsaurids like *Jaculinykus* had tiny but powerful forelimbs that might possibly have allowed them to excavate underground tunnels, and if this collapsed, it would have preserved its life position.’

‘However it came to be buried, being underground protected it from scavengers. This ensured it is one of the best preserved alvarezsaurids from this period, greatly improving our understanding of their anatomy and ecology.’

The new species was found in Mongolia’s Gobi Desert, which is one of the richest sources of dinosaur fossils in the world. The first recognized dinosaur eggs were discovered here a century ago, while many famous species such as *Oviraptor*, *Protoceratops*, and *Velociraptor* have also been unearthed in the region.

Professor Paul Barrett, a dinosaur expert from the Natural History Museum, says, ‘Mongolia is rich in Late Cretaceous rocks which provide a really detailed view of the end of the dinosaur era.’

‘Fossils of dinosaurs, mammals, lizards and



them, and its head curled back. This is similar to how birds sleep, with the pose thought to help the animals keep warm by reducing heat loss.

‘Previously, this posture has only been seen in a couple of dinosaurs, including a troodontid known as *Mei*,’ Paul explains. ‘As it comes later in the dinosaur lineages

other animals are well-preserved, and the bones look almost modern when they come out of the ochre-colored rocks.’

Among the many dinosaurs to be discovered in the region are the alvarezsaurids, a group of dinosaurs with many similarities to birds. These include characteristics such as a light skull, small body size and a structure known as a keeled sternum, which allows large arm muscles to attach.

The similarities are so pronounced that when they were first discovered, some scientists believed these dinosaurs might be the direct ancestors of some living birds. More recent research has instead revealed that they are relatives who adapted to similar challenges in a process known as convergent evolution. Though they’re not directly related to birds, the alvarezsaurids continue to fascinate due to their unusual characteristics – most peculiarly of all, their hands.

‘Like all meat-eating dinosaurs, or theropods, the earliest alvarezsaurids had three-fingered hands,’ Paul explains. ‘Over time, however, the outer fingers get smaller, and eventually disappear altogether.’

‘Meanwhile, their thumbs develop a big claw and get much larger, while their arms become shorter but stronger. It’s thought they might be anteaters, and they also have flexible skulls which might have helped them to eat larger, struggling insects.’

*Jaculinykus* is midway through this process, still having one small finger alongside its large digging thumb. This helps to fill a gap in the evolution of these dinosaurs, which tend to be found with either one or three digits.

As well as its arms, the posture of the new species is also revealing. At the time of its death, the dinosaur had its legs folded on either side of its body, its tail wrapped around

than other bird-like poses, such as brooding, it’s reasonable to assume that birds and their near relatives inherited their resting position from a common ancestor.’

Finding out what this common ancestor could be, however, is difficult, as the fossils of small dinosaurs like the alvarezsaurids are often badly preserved.

‘Small dinosaurs can have thinner and more fragile bones, which make them more vulnerable to being damaged,’ Paul says. ‘From the fragments that survive, we know that alvarezsaurids certainly lived in other areas of the world, but we may not be seeing the full diversity of the species that lived there.’ But in Mongolia at least, they appear to have been relatively common. With the discovery of *Jaculinykus*, nine genera of alvarezsaurid have now been found in the region.

While these dinosaurs wouldn’t have all been alive at the same time, there may have been three or four different species co-existing at different points in the Late Cretaceous. ‘This diversity might be explained by the environments of the past,’ Kohta says. ‘The Cretaceous sediments in the Nemegt Basin suggest there were once a variety of moist and dry habitats.’

‘As these environments changed over time, they could have promoted the adaptive radiation and diversification of the region’s terrestrial vertebrates, including the alvarezsaurids.’

It’s hoped that the completeness of *Jaculinykus* will contribute towards explorations of this diversity, and to help reconstruct its more fragmentary relatives around the globe.

<https://www.nhm.ac.uk/discover/news/2023/november/new-species-big-thumb-dinosaur-discovered-mongolia.html>

### Sunshine Requests

If you know someone who could use a little sunshine—birth, illness, surgery, family death—please contact Joanie Hanson at 218-831-2665.



**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.*

**Cuyuna Rock, Gem,  
& Mineral Society**  
on the Web

[www.cuyunarockclub.org](http://www.cuyunarockclub.org)

## The World of Jasper

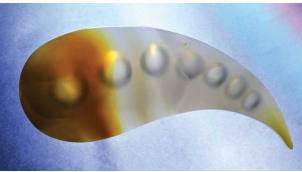
Rocky Butte Jasper

Rocky Butte Jasper is extracted from the swaths of the western Oregon. It is one of the oldest sediments that originated through the ashes of the volcanic flows.



The properties of this beautiful, precious rock are similar to Eastern Oregon picture jasper. Moreover, on its surface, Picasso paintings-like pictures can be seen. It measures seven on the Mohs Scale. It can be easily discerned for its prominent emerald-green, carrot-orange hues along with azure-blue and cocoa-brown tints.

## Bench Tips: How to Drill Holes in Cabochons



If you know how to drill holes in cabochons, creating decorative patterns is the next step. Here's

how to make a pattern with graduated size holes.

I started by selecting a slab with different colors with no definite pattern. It did have some internal clear distortions that were created during the formation of the material.

I went back to one of my favorite shapes – a curved teardrop – to design the piece. Past patterns of the cab had a gentle inside curve that fit my 8-inch diameter grinding and sanding wheels. This made grinding and sanding the curve easy to accomplish.

On this piece, I increased the inside curve and it mandated a different method to grind and sand the curve. I used a 1-inch Mizzy silicon carbide grinding wheel. These wheels are designed to be used dry. I like using them because I can access areas where bigger wheels will not reach. They grind rather quickly and aggressively and you do not have water obscuring your progress. Their use mandates wearing respiratory protection.

Mizzy wheels work quickly but do not leave a smooth surface. Considerable sanding efforts are needed to get a polishable surface.



I have changed from using silicon sanding paper to using silicon carbide sanding blocks. I start with the flat side of a 220-grit soft binder block. I hold the carving block parallel to the previously ground surface and push it at an oblique angle into the curvature. This

Coming Early 2024!!!



## Rock & Art

Bringing Rocks, Gems, & Lapidary Arts together for you!  
(Downtown, St. Cloud)

### Volunteer Needed

The Club is looking for a field trip coordinator. This person would look for locations to rockhound and organize the trip. It would not be necessary to go on every trip. Assistance given by Board members. Call/text Ed Opatz at 320-250-1363.

allows the sanding to be quickly accomplished. I repeat this with 400 and 600-grit blocks to finish the sanding.



The height of the cab is 3 and 3/4 inches. I use a 3 and 1/4" diameter circle template to layout the location on the back of the cab for the diminishing-sized round holes. I space the largest holes further apart and reduce the distance between them as the holes get smaller.

The sets of diamond ball burs that I use are graduated in size from large to small. The sizes are not marked on each bur, so I have to measure each one with a caliper to ensure the ones I use are a consecutive amount smaller than the last one used.

I drill the holes with a 36-grit bur to within 4mm from the front surface of the cab. I finish the grinding with a 220-grit bit and finally a 400-grit bit.

Polishing involves making small wood burs using a coarse file shaped to fit in the holes. You do not have to make a wood bur for each size of the hole. A smaller bit will polish a larger hole. I made four different sizes of bits including one small enough for the smallest hole. I use cerium oxide mixed with water to make a heavy paste to polish the holes.



When viewed from the front, the smaller holes at the top of the cab have a sideways oblong appearance because of the higher dome curvature of the cab at the curved point.

<https://www.rockngem.com/how-to-drill-holes-in-cabochons/>



**SeashellsbyShelly  
Rock & Crystal Shop**  
2625 County Road 37 NE  
Monticello, MN  
Open Mon 12-4, Fri 3-6  
Sat 11-5, Sun 12-3  
ph 763-295-2440  
Huge shop with tons of inventory!  
Rock cutting services and a dark room with  
fluorescent minerals!  
[Seashellsbyshelly.com](http://Seashellsbyshelly.com)

## Minnesota Rock Shops

- Agate City** 721 7th Ave., Two Harbors  
218-834-2304
- Agate Trails of Fellerer Creations** 471  
Arrowhead Ln, Moose Lake 320-279-3553
- AM Rock Shop** 710 E River Rd, Anoka  
763-421-2807
- Art & Soul** 5124 202 Main St Stillwater,  
651-275-0255
- Beaver Bay Agate Shop** 1003 Main St.,  
Beaver Bay 218-226-4847
- Christy's Crystals** 407 N Riverfront Dr,  
Mankato 507-720-1061
- Designed In Stone** 841 Forest Ave E Suite  
110, Mora 651-248-8768
- Dream in Jasper Crystal Shop** 107 N  
Meridian St, Belle Plaine 763-301-1058
- Enchanted Rock Garden** 1228 E 66th St,  
Richfield 612-866-1140
- Jon's Gem Emporium** 184 North Hwy  
10, Motley 218-640-1047
- Magic Mushrooms in the Crystal Garden**  
171 Lake St N, Big Lake 612-805-7111
- MO'R Designs** 2100 Snelling Ave N  
Suite 13, St Paul 651-294-3069
- Naturally Unique** 137 Western Ave N,  
Park Rapids 701-429-0409
- Rocks and Things** 201 N Rum River Dr,  
Princeton 763-389-0979
- Rocks & Tools SeashellsbyShelly Rock  
and Crystal Shop** 2625 County Rd 37 NE,  
Monticello 763-295-2440
- Sacred Sage and Crystals** 118 Broadway  
E, Little Falls 320-360-3611
- Sample's Agates Gem and Mineral Shop**  
18581 MN-371, Brainerd 218-821-6623
- Taylor's Falls Bead Store** 364 Bench St,  
Taylor's Falls
- Those Blasted Things** 924 Kniss Ave.,  
Luverne 507-283-4027
- Twin Pines Trading Post** 31049 Front St,  
Pequot Lakes 218-839-0829
- Uncle Tom's Rock Shop** 2746 Hoffman  
Dr. NW, Owatonna 507-451-2254
- ZRS Fossils and Gifts** 3018 Lyndale Ave  
S, Minneapolis 612-824-1068

**Rocks Gems Fossils Minerals**

**JON'S GEM EMPORIUM**

Call Or OPEN FRI AND 218-  
Text To SAT 10-6 SUN 12-5 640-  
Shop Off Hours 1047



## Gem Encyclopedia

### Iolite

This stone, which represents one of the few relatively available and affordable blue stone options, is rapidly gaining in popularity. Arguably the gain is due more to exposure in mail order catalogs and on cable shopping channels than to promotion by traditional jewelry stores. Run of the mill stones often have a steely, inky or washed out blue color, but the best specimens can rival AAA tanzanite in the saturation of their blue-violet hue.



Iolite is frequently step cut to enhance color and often windowed and/or shallow cut to lighten tone. The cutter must orient the rough carefully, taking iolite's trichroism of blue, gray and near colorless into account. So far, no treatments have been successfully used to lighten color or to remove inclusions, so one can assume that gems are untreated.

Its hardness of 7-7.5 makes it a suitable jewelry stone, though the presence of cleavage must be taken into account and some care exercised. Most of the iolite in world commerce comes from India, but substantial amounts are also mined in Tanzania, Brazil and Sri Lanka.

Sinkankas lists the wholesale value of fine blue violet stones in the 1 to 5 carat range as \$60 to \$80 per carat and \$100 to \$150 per carat for stones 5 to 10 ct. He also notes that stones larger than 8 carats are rarely eye clean. Federman is more conservative, listing retail values as \$100 and \$150 per carat, respectively, for those size ranges. Writing in 1990 he reports that German cutters have been buying iolite rough in quantity to capitalize on an expected surge in popularity and price.

<https://www.gemsociety.org/article/iolite-jewelry-and-gemstone-information/>

## Minerals Used in Every Day Life

Something as simple as a pencil requires more minerals than you might imagine. While a pencil casing is painted wood with a hollow core, the rod within the core is a combination of graphic (carbon) and kaolinite (clay). The more kaolinite, the harder the rod. This is why we have #2, #3, and other pencil grades that leave either a wide dark streak or a slender light streak. While the pencil eraser is a natural or synthetic rubber, it may contain pumice to provide grit. Holding that eraser to the pencil is a tube constructed of aluminum (from bauxite) or brass (from copper plus zinc, or sphalerite). Four to six minerals in a common pencil. Who knew?!



**There are Club members who teach lapidary related classes at the Paramount in St. Cloud.**

**Here is the upcoming class:**  
More information is available at:  
[www.paramountarts.org](http://www.paramountarts.org)

**Intro to Lapidary:  
The Art of Working with Stones  
Tues., Jan. 23-Feb. 20, 6-8p.m.  
Fee: \$145 Instructor: Jim Magnuson  
Beginner, no prior experience needed**



Participants will learn to use apidary tools & processes to create cabochons and pendant necklaces, and (if desired) face polished stones for display using gemstones they have brought and/or those provided by the instructor.

Lapidary processes of tumbling, cutting/sawing, shaping, polishing, and drilling will be taught. Each course participant will go home with multiple finished lapidary pieces.

**Wire Wrapping Stones  
Saturday, Feb. 24 9 a.m.—3 p.m.  
\$95 Instructor: Jo Schwalboski  
Beginner, no prior experience needed  
Ages 14+**

Join us as we dive into the exciting world of stone wire wrapping! Choose from 100's of unique stones in fun colors and shapes, to wrap in ornate designs using copper or brass wire (silver wire upgrade option available for an additional charge the day of class). Jo will provide all of the techniques, tips, tools, and materials for you to walk away from class with a completed piece that you will be proud to wear or give as a gift!

All materials to create one wrapped stone are included in the cost of tuition.

\*Upgrade options of stone size and type, along with silver wire are available for an additional cost at the time of class.



**Two hundred twenty five million years ago the first dinosaurs evolved from lizards.**

## ROX BOX

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



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

**For Sale:** 5 spools (10 yards each) of chain in a variety of colors. Includes jump rings and clasps. \$25 for all. Also some sterling silver chain. Please call Marie Israel at 218-924-4017.

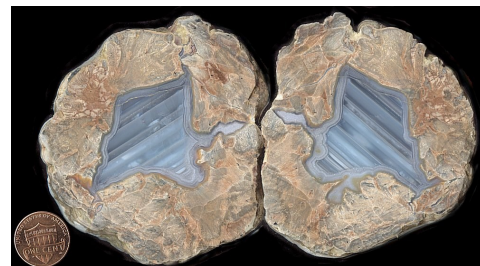
**For Sale:** I have many pieces of equipment for sale—saws, tumblers, flat laps, and grinder/polisher/sanders. I also have many wheels and motors. Contact Ed Opatz at 320-250-1363 or [opatz1@att.net](mailto:opatz1@att.net)

**Wanted:** Rock Saw, 14-16 inch blade and tumbler, 20+ pounds. Contact Mike Stanwood at 218-821-4775.

## Agates From Around The World

### Blue Star Thundereggs

Butler Ranch Hermanas, Luna County  
New Mexico



The "Blue Star" Thundereggs were discovered by Peter Ghitney and his son somewhere in the southern edge of Butler Ranch when they found a thunderegg with strong pastel colored biconoid agate. The commercial mining was attempted but ended shortly when they dug up too many thundereggs with small agate cores so the mine was considered a bust and reclaimed as per BLM specifications.

Most thundereggs contain bluish purple horizontally banded agates, hence "Blue Star" and few have been found with red to orange colors. Some surprise finds included yellow to orangish sagenite inclusions and tight-banded agates with shadow effects.

<https://www.sailorenergy.net/Agates/AgateThundereggNewMexico-BlueStar02lg.jpg>



## Kids' Corner

### Glaciers

A glacier is a very large, thick mass of ice that stays frozen from one year to the next & has the ability to move. If you squeeze a snowball really, really hard, it will eventually turn into an ice ball! Guess what - that's how a glacier is formed! Snow falls from the sky every winter, laying a white blanket over our landscape. High up in the mountains, this blanket of snow get very thick & in some places it doesn't completely melt away. Snow that lasts over the summer is called firn. When the next winter comes around, that firn gets buried by more snow, and more snow the year after that. The more the snow gets buried, the more it gets compressed and eventually turns into ice. Thousands of years of these cycles have formed thick glaciers in our mountains!

Glaciers are actually very, very slow moving solid rivers. The ice inside the glacier moves very slowly as gravity pulls the glacier down the mountain slope, which causes stretching and cracks to develop in the glacier ice. Also, water flows to the bottom of the glacier which makes it slide easier on the ground. Just like rivers, glaciers can erode the nearby land and transport a lot of material. Sometimes glaciers are referred to as "nature's bulldozers" because they can completely modify the landscape through these processes.

<https://dggs.alaska.gov/popular-geology/kids/glaciers-climate.html#:~:text=The%20ablation%20zone%20is%20the,zone%20from%20the%20ablation%20zone>

### Bench Tip Not Just For Oral Hygiene

Use a motorized throw away toothbrush on articles that need a quick cleaning. Let the brush do all the work. It gets behind stones perfectly without scratching polished pieces. Keep the brush next to the ultrasonic at all times for quick dipping.



<https://www.ganoksin.com/article/jewelry-making-bench-tips/>

The Club is always looking for places to pick Lake Superior agates or other Minnesota rocks. If you know of somewhere that we can get permission a group to pick, please call Ed Opatz at 320-250-1363. A stipend is paid to the landowner.

## 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  
Oregon Geodes  
Chalcedony  
Desert Rose  
Plume Agate  
Yellow Jasper  
Bruno Jasper  
Owyhee Picture Jasper  
Brazilian Agates  
Amethyst  
Obsidian  
Mineral specimens  
Hauser Bed Agate  
Thundereggs  
Mexican Geodes  
Montana Petrified Wood  
Montana Moss  
Tee Pee Canyon Agate  
Slabs of all sizes and types  
Septarian Nodules—Utah  
79 Bed Geodes—Oregon  
Moroccan White Agate  
Mexican Luna Lace Agate  
Small Botswana Agate  
Smokey Quartz crystals - Colorado

Snowflake Obsidian  
Utah Petrified Wood  
African Blue Lace Agate  
Carnelian Agate  
Tiger Eye—red and blue  
Tiger Eye—gold & blue Variegated  
Obsidian



Condor Agates  
Agua Nueva Agates  
Polychrome Jasper  
Tabasco Agate Pairs  
Sunset Jasper  
Noreena Jasper  
Tiger Iron  
Kumerha Jasper  
Swazi Agate  
Calandria Agate (Mexico)  
New Moroccan Agate

**New!**  
Bear Canyon Agate

Unnamed Montana Jasper  
Royal Imperial Jasper

### China Drills Into The Earth To Investigate The Cretaceous System

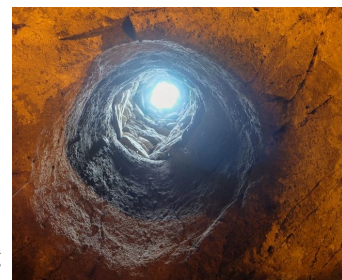
Scientists in China have begun digging a 10,000-meter (32,808 feet) hole into the Earth, the deepest ever attempted in the country.

Digging down through 10 layers of rock, the team hopes to reach rocks from the Cretaceous Period, the layer known as the Cretaceous System, which dates back up to 145 million years. The project, which broke ground recently, could be used to identify mineral resources as well as help assess environmental risks like earthquakes and volcanic eruptions, according to Bloomberg.

The hole, while impressively deep, will not be the deepest human-made hole on Earth. That title goes to the Kola Superdeep Borehole, on the Kola Peninsula in northwestern Russia. The project, which spanned from May 24, 1970, to just after the collapse of the Soviet Union, saw the deepest branch of the hole reach 11,034 meters (36,201 feet) below sea level.

The team found that the rocks deep below the Earth were a lot wetter than they were expecting. Before the borehole found it, scientists had thought the water would not permeate the rock so deeply. They had also been expecting to find a layer of basalt beneath the continent's granite, as this is what was found in the oceanic crust. Instead, they found that beneath the igneous granite was metamorphic granite. Since the continental crust was granite all the way down, this was

evidence for plate tectonics, a theory that had only recently begun to be accepted when they began digging the borehole.



Digging into the Earth doesn't always go so smoothly. An American team in the 1960s reached 183 meters (600 feet) beneath the seafloor, going through 13 meters (43 feet) of basalt in the uppermost layer of oceanic crust before the project was canceled due to mismanagement and financial troubles. With these problems aside, the task is still a huge undertaking.

“The construction difficulty of the drilling project can be compared to a big truck driving on two thin steel cables,” Sun Jinsheng, an academic at the Chinese Academy of Engineering, told Chinese state news agency Xinhua of the latest Chinese efforts.

While exciting, mantle fans await disappointment. The Earth's crust, on land, is variable. On average it is about 30 kilometers (19 miles) thick, though under mountain ranges it can reach as much as 100 kilometers (62 miles). We are far from reaching the Earth's mantle and tasting the forbidden goo.

<https://www.iflscience.com/10000-meter-hole-china-drills-into-the-earth-to-investigate-the-cretaceous-system-71003>



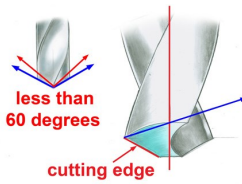
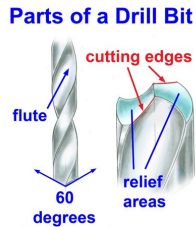
## How to Sharpen a Drill Bit

Small, fine drill bits used for jewelry making will become dull with normal use. Worn cutting edges make tasks more difficult and time-consuming and can cause costly accidents, including damage to jewelry and gemstones or even injury. Maintaining the cutting surfaces on your tools will ensure clean, consistent work at the bench.

This installment will teach you how to sharpen the cutting edges of a fine drill bit. There are different styles of bit tips, but this example features a chisel tip.

Let's begin with a look at its anatomy.

A drill bit has two cutting surfaces, one on each side of its center axis, that are cut at an angle of approximately 60 degrees.



### Angle of relief area plane

This relief area prevents contact with the metal being cut as a hole is drilled, which reduces drag & friction.

The helical groove in the drill bit is called the flute. It acts as a channel to guide the cut material out of the hole created by the two cutting edges.

We will file each of the relief areas to sharpen the drill bit, maintaining the same angle as these planes, which is important for the drill bit to perform properly after sharpening. The cutting edges will be honed by reducing a

small amount of metal from each surface. Notice that each of these angled surfaces is also cut at a slightly narrower angle, creating another plane. This plane creates the cutting edge as well as a

small amount of metal from each surface.

Begin by inserting and tightening a silicon carbide separating disk in a No. 30 hand piece of a flex shaft. Secure the worn drill bit in a screw mandrel and brace against the bench pin as you position the bit to be filed on the relief area.



maintain the original angle of relief plane

Carefully lower the separating disk to lightly touch the targeted surface. Without changing the angle, rotate the bit in the holding device and repeat on the opposite relief area plane. Once this is complete, you will have a newly sharpened bit. This may take a bit of practice, but it's a valuable technique that can save time on the job.

<https://www.gia.edu/bench-tip-how-to-sharpen-drill-bit>

## Couple Finds Forest Of Gigantic 60 Million-Year-Old Petrified Trees

Jeanne Peterson and her husband, Robert Suchor, weren't expecting any tree problems when they started building an RV park outside Buffalo, Wyoming. There were no trees on the property — or so they thought.

Turns out there were some huge trees, they just weren't growing up from the ground. The couple instead found a 60 million-year-old petrified forest of some of the most giant trees that ever lived in Wyoming.

When they started building their home, Peterson and her husband found pieces of petrified wood and roots on the property, but nothing large enough to cause concern. But as they dug further, they found a forest.

"We started to find trees sticking out of the side of the hill," Peterson said. "Multiple trees. There's petrified wood everywhere around us."

When large earth movers were brought in to excavate infrastructure for an RV campground, Peterson had a hunch they would find something much larger. It was branching out at their feet.

"On the surface, we could see branches, which is just crazy. You could see where it branched out on both sides," she said.

Now, a 35-foot-long section of a prehistoric tree has been exposed, its trunk well over a foot in diameter. Another section of indeterminate length is still buried.

The tree is fully fossilized, but the texture of its bark is clearly visible. It's an artifact from a prehistoric age when Wyoming was warmer, wetter and covered with towering trees like these.



Peterman hasn't had any paleobotanists look at the tree, but she has an idea what it might be. The property is adjacent to the Dry Creek Petrified Tree Environmental Education Area on BLM land only 2 miles away.

The petrified trees at Dry Creek have been identified as metasequoias, or dawn redwoods. There are no living metasequoias in Wyoming today, but they were widespread 60 million years ago during the Eocene Period.

In the Eocene, Wyoming's climate was similar to the coastal regions of modern-day Florida and Louisiana. In this warm, wet environment, metasequoias thrived and could grow to their full height of over 160 feet.

Wyoming is well known for its spectacular Eocene

rocks and fossils. The fossils found and preserved at Fossil Butte National Monument outside Kemmerer are also from the Eocene.

Based on their location and the tree's overall look, Peterson thinks they've uncovered a remarkably well-preserved metasequoia. It's certainly large enough to be one.

"This whole area is metasequoia," she said. Several unexplained fossils also have turned up, like leaves as big as Peterson's hands. They aren't from a metasequoia, but resemble modern-day magnolias, which also thrived in Wyoming during the Eocene.

Peterson thinks it's amazing to find an intact 60 million-year-old metasequoia forest, but that's not what she had in mind for the property. She's still unsure how to care for her massive metasequoia, but now her entire project has been configured to accommodate the tree.

"Our focus is building this RV campground," she said. "We've moved our water lines to accommodate this tree, but it's still uncovered."

While massive, the fossilized tree is extremely fragile. If they attempt to move it without the proper precautions, the 35-foot trunk would likely shatter into a 10,000-piece jigsaw puzzle.

When Peterson posted a photo of her discovery to social media, it got more than 13,000 reactions and hundreds of comments with suggestions on how to care for the tree, and from some who wanted to acquire it.

"A few people said I should sell it because it's probably worth enough money for us to pay off our RV park," she said.

Peterson wants to preserve and display the tree at the finished RV campground, so long as it remains intact and isn't torn apart by visitors looking for a souvenir piece of petrified wood.

"We're trying to figure out how we can move it and get it above ground so we can display it," she said. "We're not quite sure how to do that, but we'll figure it out soon."

Meanwhile, construction on the RV campground continues. Peterson said the digging is almost, but not entirely, done. That means there could be more 60 million-year-old metasequoias waiting to be unearthed. They're not out of the woods yet.

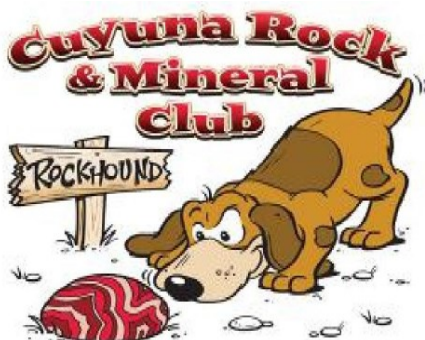
"We've got two septic tanks we are getting ready to dig, and they're really, really big," she said. "Who knows what we're going to come across?"

<https://cowboystatedaily.com/2023/11/04/wyoming-couple-finds-forest-of-gigantic-60-million-year-old-petrified-trees/>

Marcia Opatz, Editor  
Cuyuna Rock, Gem  
& Mineral Society  
1001 Kingwood Street  
Suite B-40  
Brainerd, MN 56401

## FIRST CLASS MAIL

December



## The Agate Explorer

December 2023  
Official Publication of the Cuyuna Rock,  
Gem & Mineral Society



Members of AFMS & MWF

### Notes from the President

I grew up in family that loved card games, dice, and betting. I guess that's why I like the white elephant dice game at the Christmas party. Get ready! I love to steal!

Marcia tells me that we have a bunch of items to wrap up. I usually find a couple of rocks to wrap too. Club members don't have to wrap more than one gift, but you can bring more than one if you want.

I also like the potluck part of the party too. I love the corn casserole that Marcia always makes to bring, and there is always a lot of other good food. Make sure you email Marcia (the address that the newsletter comes from) or text 320-250-8120 with what you are bringing. That way not everyone bring the same thing.

Marcia and I will be leaving at the end of the month for our winter adventures in our RV. Two stops are Quartzsite and Tucson, where there are lots of places to buy rocks. If you plan on traveling to either of those places this winter, or have some particular rock you are looking for, please call me at 320-250-1363. We can add your rock to our shopping list, and if you plan on going to either place we'd love to meet you for a meal, shopping, or maybe even a rockhounding trip.

Planning has started for field trips for 2024. Do you have places that you want to collect next year? It would be great to have someone help plan too. Let me know if you want to do that.



*Ed Opatz*

### Club Officers & Board of Directors

cuyunarockgemclub@gmail.com

**President:** Ed Opatz  
opatz1@att.net  
320-250-1363

**Vice-President:** Lori DuBois  
waboos.dubois@gmail.com  
(320) 237-4761

**Secretary:** Joanie Hanson  
secretarycuyunarockgemclub@live.com  
218-831-2665

**Treasurer:** Kevin Martini  
treasurer@cuyunarockclub.org  
kjspumanti69@gmail.com  
218-770-8917

**Director:** Vern Iverson  
**Director:** Judi Laurence  
**Director:** Jo Schwalboski

**Newsletter Editor:** Marcia Opatz  
theisma@hotmail.com  
320-250-8120