



# Cedar Valley Gems



Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

[cedarvalleyrockclub.org](http://cedarvalleyrockclub.org)

CEDAR VALLEY GEMS

DECEMBER 2018

VOL. 44, ISSUE 10

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**Next CVRMS Meeting**  
**Tues. DEC. 11**  
**HOLIDAY PARTY**  
**& POTLUCK**

The **CVRMS 2018 Holiday Party** will be a week earlier than our usual monthly meeting, on **December 11** at the Hiawatha Community Center in the Hiawatha City Hall, 101 Emmons St., Hiawatha. We will **meet around 6:00 pm and eat at 6:30 pm**. The club will provide ham and turkey, potatoes, dressing, and gravy (prepared by Dell) as well as soft drinks. Participants are invited to bring other dishes to contribute to our annual feast. Please bring your own **table service** and a **big appetite**. Ray has prepared a show of slides contributed by participants in the Field Trip to the Milwaukee County Museum. *See Page 6 for Additional Information*



Hiawatha City Hall and Community Center

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## — FROM THE PRESIDENT —

Upon seeing this headline, I know you were wondering, is this from President Trump. The answer is NO, just me. I hope everyone had a great Thanksgiving and was able to be with family and friends and share wonderful and filling food. Black Friday and Cyber Monday are behind us and we are now headed towards one of the most important holiday seasons of the year, CHRISTMAS. As we go about our shopping, partying, and family get togethers let us not forget the true meaning of Christmas and why we celebrate this event. Take time to do the things that make those around you feel blessed to know you and to have you as a friend.

For our Cedar Valley Rocks and Minerals Society it is also the start of a busy several months as we prepare for our show coming up in March. While things may have seemed quiet, there actually has been a lot of work done to this point. You may not have noticed this since much of the work was performed behind the scenes. However, this year is different than past years since we are hosting not only the Midwest Federation Show but also the American Federation Show. This requires considerable extra work by a few individuals at the start and much work by many individuals later. As we get close to the setup time for the show, we will be asking for additional help in many areas both leading up to the show, setting up for the show, and tearing down after the show. I know individuals join our club for various reasons and some may not be able to contribute to the show in the form of labor for the many duties that need to be performed, but there are various ways that everyone can help. Donations of things for the pebble pit, silent auction, and door prizes are areas where people can help.

Also during the show the more volunteers we have for the various tasks the better everyone can enjoy the show. Also, keep in mind that profits from our show goes to scholarships so we are not only having fun as a club but also providing financial help to future geologists.

The club tries to provide many activities and opportunities for people to participate, including some nice benefits like our fall bus trip. In addition, we provide a great newsletter, field trips, MSHA training, three hands on activities during the summer picnics, the much anticipated auction in the fall and a holiday party in December. We also have some great monthly programs during the months of September thru May. Your participation in any of these activities would be greatly appreciated. I would definitely like to see better attendance at these meetings as we do have some great speakers and programs.

In summary, it is through active participation by many people, that we as a club have been able to do the many things we do, so I would ask everyone to do their part no matter how small or big that may be. With that, I would like to wish everyone a Merry Christmas and Happy New Year. May the holidays bring you much joy and happiness.

**Marvin Houg**, President

## CVRMS Nov 20 Meeting

### Hiawatha Community Center

Called by President Marv Houg at 7:20 pm  
at Hiawatha Community Center

**Secretary's Report:** A motion was made by Bill Desmarais to approve the secretary's report as published. 2nd by Jay Vavra. Carried.

**Treasurer Dale Stout** reported a balance of \$9,481.65, minus about \$500.00, in checking. Motion was made by Sheri Mealhouse and seconded by Scott Cleppe to accept the Treasurer's report. Carried.

**Program:** Ray Anderson introduced Phil Kerr, who presented a program on "Iowa's Ice Age History – A Look at the Frigid Past," in which he detailed the ice advances in Iowa.

### Annual Meeting Called by President Marv Houg at 9:00 pm

**Election of Officers:** The Nominating Committee of Ray Anderson, Sharon Sonnleitner and Jay Vavra presented a slate of Bill Desmarais for Director to 2021 and Kim Kleckner for Liaison to replace Bob Roper, who resigned. There were no nominations from the floor. Sheri moved to cast a unanimous ballot. AJ Johnson seconded. Carried

**Correspondence:** Dale asked for orders for the Agate Calendar put out by The Gem Shop, Cedarburg, Wisconsin.

### Bill's Big Bus Boogie – Nov. 4th – Milwaukee Public Museum:

Bill reported 34 members traveled to the museum, which had a great variety of very fine exhibits. The only drawback was a flat tire, which caused close to a two-hour delay. 51 people had signed up for the trip; 8 notified Bill they were not going; 9 did not give notice. The Board will discuss how to handle the large number who dropped going forward.

Bill is considering Henry Doorly Zoo in Omaha for the next trip and will probably move the date earlier in the fall when most of the animals are still in their outdoor enclosures; although if the weather is inclement, zoo-goers can spend their time visiting the indoor exhibits. Bill also considered the Platteville mining museum and Dodgeville mineral museum.

**Show:** Ray said nothing is new on the AFMS/MWF show.

**Auction:** Marv announced the September auction is already full, with about 1,300 lots.

**Holiday Party:** Marv announced the Holiday Party/Potluck will be the 2nd Tuesday of December (the 11th). Gather at 6:00; eat at 6:30. Setup can start at 3:30 – Marv will check with Dell James on what time she wants to get in. Dell is preparing the turkey, potatoes, dressing and gravy. Jeff Groff will be asked to prepare a ham. Others are asked to bring a side dish dessert, or appetizer. Table service will be furnished. Ray will have a slide program of the Museum trip. Julie Whitlatch declined organizing games after doing so for a great number of years, so Kim suggested we have members bring a couple specimens for Show and Tell. She also suggested we have a monthly theme and bring specimens to each meeting.

**Door Prize:** Tom Whitlatch won the monthly door prize.

**Adjournment:** AJ made a motion to adjourn. 2nd by Tom. Adjourned at 9:30.

Respectfully submitted,  
Sharon Sonnleitner, Acting Secretary

## CVRMS Board Minutes Sept 25

Called at 7:15 at the home of Marv Houg

**Present:** President Marv Houg, Dale Stout, Ray Anderson, Bill Desmarais, Dell James, Jay Vavra, Sharon Sonnleitner, Rick Austin, Kim Kleckner

**HOLIDAY PARTY POTLUCK – MEAT FURNISHED:** The 2nd Tuesday of December. Gather at 6:00; eat at 6:30. Setup can start at 3:30. Marv will check with Dell James on what time she wants to get in. In lieu of games, we will have Show and Tell: bring a couple favorite specimens, which will be put on a table for viewing and discussion. Marv will check with Dell about name tags. Door prizes will be put on the tables. Setup will be for 10 eating tables, 2 serving (or use counter), 2 display and 1 for Dell. A collection will be taken for HACAP and Linn Community Food Bank. Dell will prepare the turkey, dressing, potatoes, and gravy. Marv will check with Jeff Groff about doing a ham. Others are asked to bring a side dish, dessert or appetizer.

**SHOW:** Kim has posted the show flyer on Tom's Facebook page and will post to Neighborhood groups and possibly other social media. Marv will ask TJ if we can recommend him to the Gazette's Orlan Love for an article, and then see if Tom Whitlatch can contact Orlan. Dale will post on Hoopla. Sharon will do a Gazette ad and press release. We will also check on putting info on Source, see if Cornell and UI can help with promotion via social media, and put information in the Collectors Journal. We will explore asking show-goers for emails so we can notify them of future shows.

Marv appointed Sharon as Dealer Chair after the resignation of Bob Roper. Contracts are out and four have been returned. Two dealers have conflicts for the 2019 show, so Marv and Sharon will consult to replace them.

Marv will check with Jeremy Dyer or John Haslett about doing a program on geode collecting.

**AUCTION:** The 2019 September auction is already full, with 1285-1393 committed lots. We already have a large number for 2020

**BUS TRIP:** Thirty-four members went on the November 4 bus trip to Milwaukee Public Museum in Wisconsin, which was a really good trip. Ray has put together a slide show that will run at the Holiday party. The bus was originally full, but a number of people did not attend and did not notify Bill, so there was some discussion about how to handle that in the future. One suggestion was that those people would be put on a waiting list.

Bill is planning next year's trip to Henry Doorly Zoo, Omaha, Nebraska. He has checked into group rates and found that we need 40 to be considered a group, so we will see if that is possible. Because it is outdoors, the trip will be earlier in the fall.

**DECEMBER BOARD MEETING:** Because the 4th Tuesday of December is Christmas Day, the December Board meeting was moved to the 3rd Tuesday, December 18.

**MISC:** Kim asked about starting activities for kids at our meetings and volunteered to organize them. We will check out the possibility of using the coat room for that purpose. We will look into applying for 501(c)(3) nonprofit status. Ray made a motion to adjourn. Second by Dale. Adjourned 9:45.

Respectfully submitted,  
Sharon Sonnleitner, Acting Secretary



December's Birth Stones



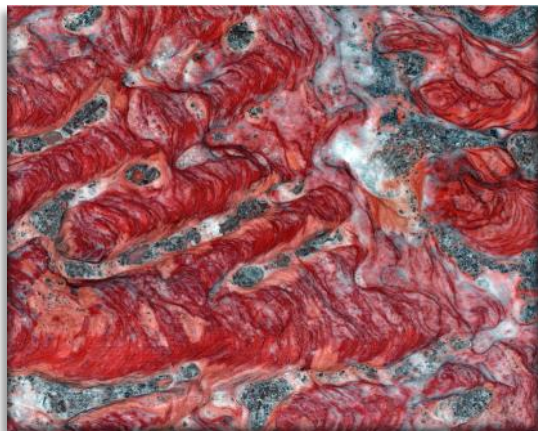
The Membership Has Voted

The November 20 CVRMS meeting was our **Annual Meeting**, which meant that members elected club officers for 2019. The membership agreed with suggestions from the nominating committee that **Bill Desmarais** continue as Director and **Kim Kleckner** be elected Board Liaison. Both candidates were elected unanimously by members present at the Annual Meeting

2019 CVRMS Officers Will Be

President	Marv Houg
Vice President	Ray Anderson
Treasurer	Dale Stout
Secretary	Dell James
Editor	Ray Anderson
Liaison	Kim Kleckner
Director '19	Jay Vavra
Director '20	Rick Austin
Director '21	Bill Desmarais
Webmaster	Sharon Sonnleitner

Congratulations Bill and Kim!!



Mary Ellen Jasper from Biwabik, Minnesota see story on page 7

If you were born in December you may choose from 3 birthstones, zircon, tanzanite, turquoise

**Zircon** is a mineral belonging to the group of nesosilicates. Its chemical name is zirconium silicate and its corresponding chemical formula is  $ZrSiO_4$ . A common empirical formula showing some of the range of substitution in zircon is  $(Zr_{1-y}, REE_y)(SiO_4)_{1-x}(OH)_{4x-y}$ . Zircon forms in silicate melts with large proportions of high field strength incompatible elements. The crystal structure of zircon is tetragonal crystal system. The natural color of zircon varies between colorless, yellow-golden, red, brown, blue, and green. Colorless specimens that show gem quality are a popular substitute for diamond and are also known as "*Matura diamond*."

**Tanzanite** is the blue/violet variety of the mineral zoisite (a calcium aluminium hydroxyl Sorosilicate— $Ca_2Al_3(SiO_4)_3(OH)$ ) belonging to the epidote group. It was discovered in Northern Tanzania in 1967, near the city of Arusha and Mount Kilimanjaro. Tanzanite is used as a relatively cheap gemstone, where it can substitute for the far more expensive sapphire after undergoing artificial heat treatment to form a deep blue coloration. Naturally formed tanzanite is extremely rare and is endemic only to the Mererani Hills. Tanzanite is noted for its remarkably strong trichroism, appearing alternately sapphire blue, violet and burgundy depending on crystal orientation. Tanzanite can also appear differently when viewed under alternate lighting conditions. The blues appear more evident when subjected to fluorescent light and the violet hues can be seen readily when viewed under incandescent illumination. Tanzanite is usually a reddish brown in its rough state, requiring heat treatment to bring out the blue violet of the stone.

**Turquoise** is an opaque, blue-to-green mineral that is a hydrated phosphate of copper and aluminium, with the chemical formula  $CuAl_6(PO_4)_4(OH)_8 \cdot 4H_2O$ . It is rare and valuable in finer grades and has been prized as a gem and ornamental stone for thousands of years owing to its unique hue. The substance has been known by many names, but the word *turquoise* dates to the 17th century and is derived from the French *turques* for "Turks" because the mineral was first brought to Europe from Turkey, from mines in the historical Khorasan Province of Persia. Pliny the Elder referred to the mineral as *callais* and the Aztecs knew it as *chalchihuitl*.

• • information from Wikipedia

# What in the World?




**What in the World** are all of these crystals and where do I have to go to find them??

## November's Photo



November's *What in the World* photo shows the **La Garita Wilderness** in the **Wheeler Geologic Area** of southern Colorado. The wilderness features layered volcanic rocks eroded into badlands topography with flat topped alpine mesas and grassy parks that winds through the healthy spruce forest like a giant fairway.



## CVRMS EVENTS OF INTEREST

2018

Dec. 11 - CVRMS Monthly Meeting

Feature Program  
"CHRISTMAS PARTY"

Hiawatha Community Center **6:30 pm**  
see p. 6 for details

2019

Jan. 15 - CVRMS Monthly Meeting

Feature Program  
"Geology of the Mary Ellen Jasper"  
by Ray Anderson

Hiawatha Community Center 7:15 pm

Feb. 19 - CVRMS Monthly Meeting

Feature Program  
"to be announced"

Hiawatha Community Center 7:15 pm

Mar. 21-24—AFMS/MWF Annual Meeting

Ramada Inn  
Cedar Rapids  
see p. 10 for details

Mar. 23-24—CVRMS Rock, Fossil,  
and Mineral Show

Hawkeye Downs  
Cedar Rapids  
see p. 10 for details

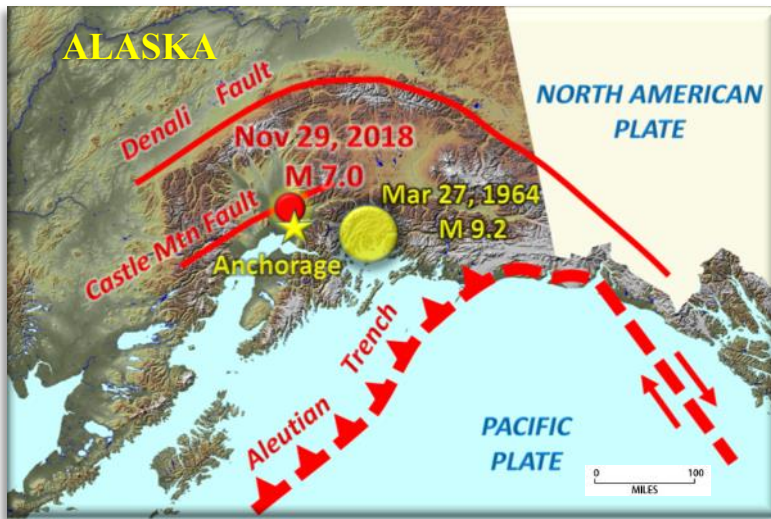
# Ask a Geologist

by Ray Anderson aka "Rock Doc", CVRMS Vice President

Ask a Geologist is a monthly column that gives CVRMS members an opportunity to learn more about a geologic topic. If you have a question that you would like addressed, please send it to [rockdoc.anderson@gmail.com](mailto:rockdoc.anderson@gmail.com), and every month I will answer one in this column. Please let me know if you would like me to identify you with the question. I will also try to respond to all email requests with answers to your questions.

**Rona asked;** "I heard that they had a big earthquake in Alaska. What's the deal with that??"

**Rock Doc answered;** "They sure did, a magnitude 7.0. Alaska has one that big nearly every year, but this one was very near Anchorage, the largest city in the state. Fortunately, the people of Alaska are used to a lot of earthquakes, and their buildings and infrastructure are built to survive large quakes, so last I heard there were no fatalities. Alaska is located at a very structurally active area, where the Pacific plate is diving beneath the North American plate after sliding along it all the way from California. As it dives under the North American plate it drags down the northern edge of its subduction zone producing the Aleutian Trench. The plates don't move fast (about 3 to 4 inches a year - roughly the speed at which your fingernails grow) but they don't slide smoothly against one another. Instead, the plates grind together and build up strains and stresses in the crust. This slow-motion collision is the source of the region's numerous earthquakes and the creator of the volcanoes that make up the Aleutian Islands. These stresses build up to a critical level, then release by slipping along a fault. Hundreds to thousands of years of accumulated plate motion compressed in a small area releases in a matter of seconds as an earthquake. The November 29 Anchorage earthquake was produced when stresses along the Castle Mountain Fault were released, just 6 miles northwest of Anchorage. The largest earthquake in North America history occurred not far from the November quake on March 27, 1964, when the "Great Alaska earthquake" hit with a magnitude of 9.2 only about 75 miles south-east of Anchorage. That earthquake, the second largest ever recorded in world history, released about



Map showing epicenter of 2018 Anchorage earthquake (red dot) and the 1964 Great Alaska Earthquake (yellow dot).

200 times more energy than the Anchorage earthquake. It was responsible for 139 deaths (15 from the earthquake and 124 from the ensuing tsunami) and about \$116 million in property damage. The Anchorage earthquake was centered relatively deep in the Earth, roughly 25 miles below the surface. That's good news for Anchorage, because shallow quakes cause more shaking than deep ones. Damage was also limited due to the low population density of the city and the lack of high-rise buildings. A magnitude 7 earthquake is a very serious shaking, only 4 larger have been recorded in the U.S. this century! Magnitude is a measure of an earthquake's energy release, and it can only tell you so much about what any given event feels like at the surface. Differences in regional geology and even the depth of the quake can affect how much the locals feel Earth's tremble. While details of the November earthquake are still emerging, researchers believe that the rupture was centered relatively deep in the Earth, about 25 miles below the surface. The plates keep moving so the earthquakes keep happening.

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Aerial photo showing damage on Vine Road south of Wasilla, Alaska after the November 30 201 earthquake.



# **CVRMS ANNUAL HOLIDAY PARTY**

**December 11**  
6:00 p.m. to 9:00 p.m. (eat at 6:30 )

*Favorite Rock Show and Tell*

*Favorite Rock Show and Tell*

***Bring Your Favorite Rock to Show  
Pot Luck***

**\* bring your own famous holiday dish \***  
**\* bring your own place settings \***  
CVRMS will provide drinks and main dish (turkey/ham)  
mashed potatoes, stuffing, and gravy, games and door prizes

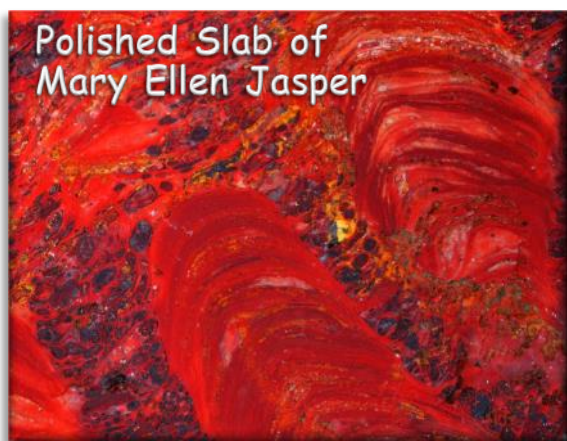
**A COLLECTION WILL BE TAKEN**  
for HACAP & Linn Community Food Bank  
(if you can't make it to the party and wish to contribute mail check to Dale S.)

**Hiawatha Community Center**  
**101 Emmons St., Hiawatha**



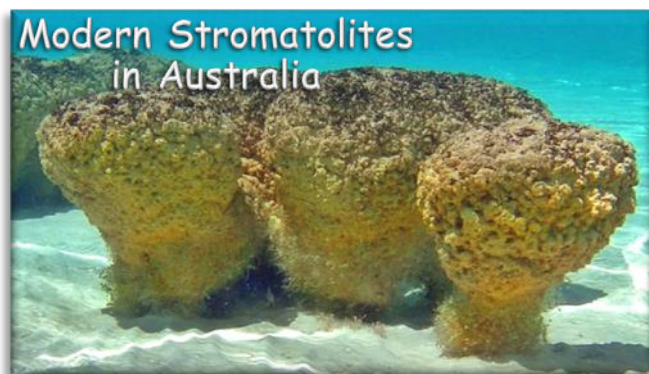
## Featured Stone: Mary Ellen Jasper

The featured stone for December is Mary Ellen Jasper, ancient stromatolites, preserved in 1.86 billion years old (1.86 Ga) jasper and hematite and found in banded iron formations (BIFs) in the Mesabi Iron Range in Northern Minnesota. Stromatolites are the earliest known biogenic structures, produced by single-celled cyanobacteria that contain chlorophyll and are able to harvest the energy of the sun via photosynthesis to produce their own food. They use sunlight to split carbon dioxide into carbon and oxygen. The carbon is absorbed, becoming part of the growing organism, and the oxygen is released into the water and eventually into the atmosphere. The oldest known stromatolites are found in the Trendall Geoheritage Reserve in western Australia



and date to 3.43 Ga. As these organisms proliferated they ultimately triggered a drastic change in the Earth's atmosphere by replacing much of its carbon dioxide with oxygen during the "Great Oxidation Event," about 2.45 Ga. Significant amounts of oxygen did not accumulate in the atmosphere until long after the stromatolites first appeared, because vast quantities of reduced materials were waiting to react with the oxygen, especially the eager-to-combine ferrous ( $\text{Fe}^{+2}$ ) dissolved iron in the oceans. The rain of oxidized iron particles in the oceans formed great iron deposits over the early 2 billion years of the Earth's history. Ultimately the cyanobacteria did raise the oxygen content of the atmosphere, from less than 1% to the 21% level of today. Cyanobacteria are extremely resilient and adaptable, and although their abundance peaked about 1.25 Ga, stromatolites have remained a major constituent of the fossil record from their first appearance to today. Evidence of fossil stromatolite formations has been found throughout the world. Their mushroom-shaped mounds dominated the shores of all of the newly developing ancient continents, including the area

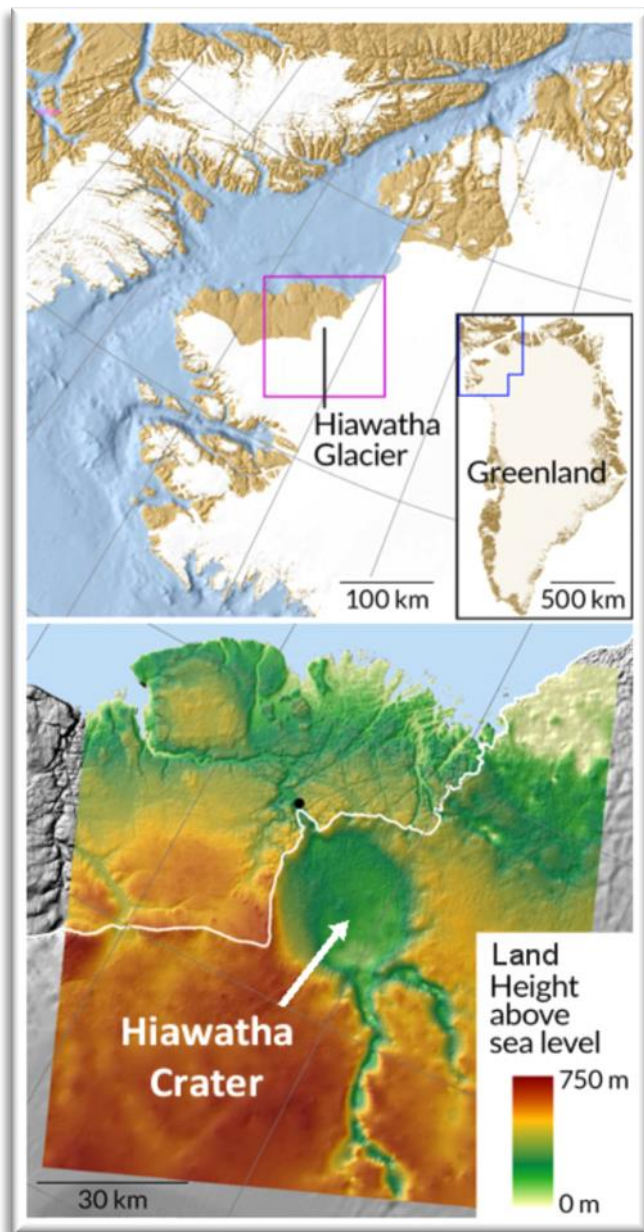
where the Mary Ellen Jasper is found. Until the mid-1950s, scientists thought that stromatolites were long extinct. That all changed in 1956 when living stromatolites were discovered in the Hamlin Pool on the south end of Sharks Bay in Western Australia. Since then, living stromatolites have also been found in several other sites. Stromatolites form when gooey strands of algae and cyanobacteria trap fine sediments carried across them by tidal currents. As the mats fill in with sediments and become opaque, the microbes grow upwards seeking sunlight. Layer upon layer they produce stromatolites, which take on a variety of shapes determined by the currents and sediments where they form. BIFs were deposited where the cyanobacteria lived near the shorelines of ancient seas that were saturated in ferrous iron, originally out-gassed into the water by undersea volcanoes. This iron reacted with oxygen released by the cyanobacteria to create the deeper water iron ore known as *cherty* or *Algona-type iron formation*. Iron minerals on land were oxidized by the oxygen that bubbled into the atmosphere. They were then eroded and washed into the seas as fine particles that stuck to and were layered into shallower water cyanobacterial stromatolites and mats. They formed the *granular* or *Lake Superior-type BIF*, including the Biwabik Iron Formation in the Mesabi Range that hosts the Mary Ellen Jasper. These rocks were deposited about 1.85 Ga, at the very end of the 2 billion year period of BIF deposition. But what about the quartz in the BIFs? Where did it come from?? Although the process is not well understood, it appears that the early oceans also contained abundant dissolved silica, much from dissolved volcanic ash. Early seawater is believed to have been saturated with silica during most of the Precambrian. As the iron concentrations locally decreased the oxygen being produced by the cyanobacteria began to combine with silica to form chert ( $\text{SiO}_2$ ). The current low ocean silica concentration is likely one of the reasons why BIFs can not form in modern conditions. It has been suggested that perhaps the evaporation of shallow seawater may have also promoted local silica oversaturation which resulted in silica precipitating as a gel on the seafloor, where it incorporated iron oxide to produce the red jasper color and produced the microcrystalline jasper. Stromatolites live in shallow water, potentially evaporative environments. Cycles of evaporation could have produced the banding of iron and quartz as sea levels fluctuated, with quartz being deposited in shallow water evaporative environments and iron being deposited in periods of deeper water. This banding could also represent seasonal cycles as modern varves do, or it could be some other major cyclical change in ocean water chemistry or biology. The Mary Ellen Jasper formed when the cyanobacteria on the stromatolites incorporated layers of red silica gel and particles of oxidized iron in the ancient seas and from the land. Frequently microcrystalline quartz from the gel dominated as the stromatolites grew and iron particles filled in the spaces and voids in the stromatolites.



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**Ray Anderson will be presenting a program on Mary Ellen Jasper at the CVRMS monthly meeting on January 15**

## Massive Impact Crater Beneath Greenland Could Explain Ice Age Climate Swing



A 19.3 mile diameter impact crater was recently discovered under a half-mile-thick Greenland ice sheet. The enormous crater appears to be the result of the impact of a 1 mile diameter meteorite slamming into the glacier-covered island at a speed of 12 miles per second as recently as 12,000 years ago. The impact of the 10 billion-ton space rock would have unleashed 47 million times the energy of the Little Boy nuclear bomb dropped on Hiroshima in 1945. It would have melted vast amounts of ice, and sent freshwater rushing into the oceans, and blasted rocky debris high into the atmosphere. Researchers first spotted a curiously rounded shape at the edge of Hiawatha Glacier (the crater was named the *Hiawatha Crater*) in northwest Greenland in 2015, during a scan of the region by NASA's *Operation IceBridge*, a mission using airborne radar to map the thickness of glacial ice on the island. Scientists then sampled and studied outwash from rivers flowing from under the glacier at the site of the crater. They discovered "shocked" quartz grains (with deformed crystal lattices) and glassy flash-melted rock grains, telltale signs of a nearby impact crater. The samples also contained elevated concentrations of certain elements, including nickel, cobalt, platinum and gold. That elemental profile is diagnostic of an asteroid impact and suggests that the impactor was a relatively rare iron meteorite. Although the crater has not been accurately dated, information from glacial debris suggest that the impact occurred during the Pleistocene Epoch, between 2.6 million and 11,700 years ago. Radar images of the glaciers around the crater site show a top-most layer of ice displaying a continuous sequence of smaller layers representing the gradual deposits of snow and ice through the most recent 11,700 years of Earth's history (the Holocene). At the base of that layer is a distinct, debris-rich layer, also seen elsewhere in Greenland ice cores, and thought to represent the Younger Dryas (a period of exceptional global cooling 12,800 to 11,700 years ago). Below the debris layer the ice is deformed. A few years ago another group of scientists reported the results of their study of a thin layer rich in carbon that contains nanodiamonds, glassy and metallic minerals indicative of a large meteor impact at the base of a package of sediments interpreted as having been deposited during the Younger Dryas. The Hiawatha Crater is likely the site of this impact. If it was formed about 12,000 years ago, the impact could have triggered the Younger Dryas event.

Such a meteorite impact would have dramatically cooled world climate. Impact on glacial ice would produce a number of water-related effects. It would vaporize ice, releasing water molecules into the air that would eventually rain back down; it could destabilize the ice such that it slides into the water; it would create icebergs; all creating a flood of freshwater into the North Atlantic affecting ocean circulation. Dust and other debris would be blasted high into the atmosphere and large areas of forest would be burned adding smoke into the sky, both working to block sunlight and creating dramatic cooling, like that seen during the Younger Dryas. The abrupt climate change is thought to have had a drastic effect on the mammals in North America. It is believed to be a factor in the extinction of the mammoths (who disappeared between 14,000 and 10,000 years ago), mastodons, and other large mammals. Like the dinosaurs, this may have been another meteor impact initiated extinction. Much work is needed to fully understand the history and effects of the Hiawatha Impact Structure. <http://www.astronomy.com/news/2018/11/massive-impact-crater-beneath-greenland-could-explain-ice-age-climate-swing>



## Modern-Looking Birds lived with the Dinosaurs

During the late Cretaceous period, about 75 million years ago, birds belonging to hundreds of different species flitted around the dinosaurs and through the forests as abundantly as they flit about our woods and fields today. But after the cataclysm that wiped out the dinosaurs, only one group of birds remained, the ancestors of the birds we see today.



This bird lived with the dinosaurs

Why did only one family survive the mass extinction? A newly described fossil, an extinct, cousin of today's birds, deepens that mystery. The fossil, an *enantiornithine* (pronounced en-an-tea-or-'neth-een) or "opposite bird," was the size of a turkey vulture and was found in the badlands of the Kaiparowits Formation in the Grand Staircase-Escalante National Monument in Garfield County, Utah. It was not flattened during burial and shows no deformation, with most bones showing beautiful three-dimensional preservation and really great detail, including muscles and tendons attachments of special interest to anatomists. What is most exciting are large patches called quill knobs on the forearm bones, which in modern birds anchor the wing feathers to the skeleton to help strengthen them for active flight. It is the most complete *enantiornithine* skeleton ever discovered in North America, and shows that *enantiornithines*, though totally separate from modern birds, had evolved some of the same adaptations for highly refined, advanced flight as modern birds. They were fully feathered and flew by flapping their wings. It is quite likely that, with a quick look at one in real life, it would be indistinguishable from a modern bird. Many *enantiornithines* had strong recurved claws, ideal for perching and perhaps climbing. It was recently proposed that the *enantiornithines* were primarily forest dwellers, and when the world's forests burned after the asteroid strike at the end of the Cretaceous, the *enantiornithines* disappeared along with the non-avian dinosaurs.

<https://phys.org/news/2018-11-rare-fossil-bird-deepens-mystery.html>

## Chlorastrolite: Isle Royale Greenstone

**Chlorastrolite**, is also known as Isle Royale greenstone, is a green variety of the mineral pumpellyite ( $\text{Ca}_2(\text{Mg,Fe})\text{Al}_2(\text{SiO}_4)(\text{Si}_2\text{O}_7)(\text{OH})_2 \cdot \text{H}_2\text{O}$ ), a complex sorosilicate with a pattern of star-like crystals that tend to be *chatoyant*,



Chatoyant chlorastrolite

meaning they have a varying luster. This chatoyancy can be sub-translucent to opaque, and the pattern created by the interface of these crystal clusters is reminiscent of a turtle shell.

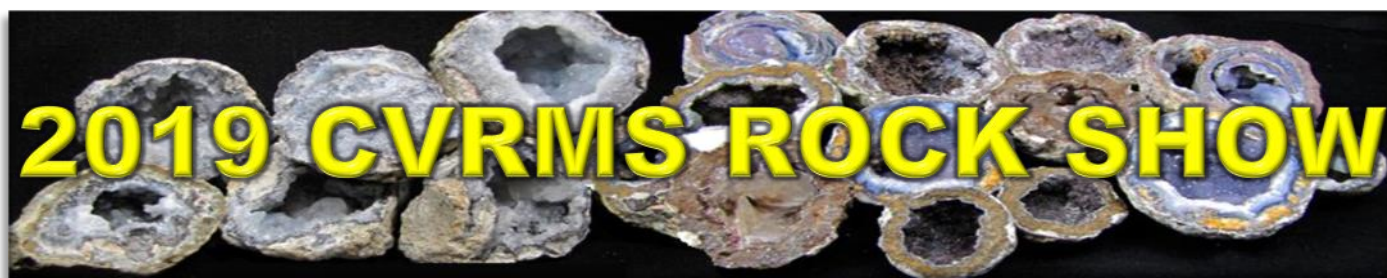
Chlorastrolite can be found in vesicular basalts in the Lake

Superior area, along with such minerals as calcite, quartz, feldspar, epidote datolite, prehenite, and thomsonite as well as agates including "Lakers." Greenstones are found in the waters and on the shores of Isle Royale, (*where it is illegal to collect due to the island's National Park status*). It can also be found in the waste rock piles located near the old copper mines on the Keweenaw Peninsula in the western Upper Peninsula of Michigan. Sites where chlorastrolite has been found include the Central, Central Exploration, Cliff, Phoenix, Mandan, and Delaware mines



A handful of chlorastrolite pebbles

as well as shoreline outcrops near Eagle Harbor. The greenstones appear as dark green, small round or almond shape nodules in the basaltic rock. In some cases these nodules have weathered out of the volcanic rock and can be found along the shoreline. Unfortunately, only a small percentage of the green nodules around Lake Superior are actual greenstones; most are chloride, prehnite or some other mix of minerals. And of course, only a few out of every hundred greenstones found are gem quality. It is difficult to identify an unpolished pebble of chlorastrolite. Most gem quality greenstones are very small, and it is rare to find one that is larger than a half inch. The largest gem quality stone is in the Smithsonian and measures 1.5 by 3 inches. The mineral was designated as the official state gem by Michigan's 76th Legislature. <http://agate.internetpresencetesting.com/>



Cedar Valley Rocks & Minerals Society's 55th Annual Rocks, Fossils, and Minerals Show

# "GEODES: IOWA'S MYSTERIOUS STATE ROCK"

The 2019 Show will be held March 23rd-24th, 2019  
 at Hawkeye Downs, Cedar Rapids.  
 Hours are 8:30am to 6:00pm on Saturday March 23, 2019  
 9:30am to 5:00pm on Sunday March 24, 2019

<p><b>PROGRAMS</b>                  Programs on Theme-Related Topics                  Call ahead or check our website for Speakers &amp; Times</p>		<p><b>DISPLAYS</b>                  Geodes                  Minerals                  Crystals                  Fossils                  Amethyst                  Crinoids, Artifacts                  Petrified Wood                  Polished Stones                  Spheres, Agates</p>																												
<p><b>DEMONSTRATIONS</b>                  Tumbling                  Glass Bead Making                  Cabbing, Beading                  Silversmithing                  Flint Knapping                  Geode Cracking</p>	<p><b>SLUICE FOR MINERALS (Kids &amp; Adults)</b>  <b>MANY ITEMS FOR SALE, INCLUDING:</b></p>	<p><b>SILENT AUCTION</b>                  Geodes, Minerals, Crystals, etc.</p>																												
<p><b>PEBBLE PIT FOR KIDS</b>                  1¢, 5¢, 10¢, 25¢, &amp; 50¢ Items                  \$1 Rock &amp; Mineral Kits</p>	<table border="0"> <tr> <td>Books</td> <td>Fossils</td> <td>Jewelry</td> <td>Minerals</td> <td>Book Ends</td> </tr> <tr> <td>Opal</td> <td>Agates</td> <td>Carvings</td> <td>Seashells</td> <td>Petrified Wood</td> </tr> <tr> <td>Slabs</td> <td>Geodes</td> <td>Crystals</td> <td>Tumblers</td> <td>Lapidary Equip.</td> </tr> <tr> <td>Gems</td> <td>Beads</td> <td>Spheres</td> <td>Meteorites</td> <td>Jewelry Findings</td> </tr> </table>	Books	Fossils	Jewelry	Minerals	Book Ends	Opal	Agates	Carvings	Seashells	Petrified Wood	Slabs	Geodes	Crystals	Tumblers	Lapidary Equip.	Gems	Beads	Spheres	Meteorites	Jewelry Findings	<p><b>DONATIONS REQUESTED</b></p> <table border="0"> <tr> <td>Adults .....</td> <td>\$3.00</td> </tr> <tr> <td>Students .....</td> <td>\$1.00 (12-18)</td> </tr> <tr> <td>Children .....</td> <td>Free (Under 12)</td> </tr> <tr> <td>Youth Groups .....</td> <td>Free (w/adult)</td> </tr> </table>	Adults .....	\$3.00	Students .....	\$1.00 (12-18)	Children .....	Free (Under 12)	Youth Groups .....	Free (w/adult)
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<p><b>HOT FOOD</b>                  Hawkeye Downs Concessions</p>	<p><b>PROFITS GO TO SCHOLARSHIPS NOT RESPONSIBLE FOR ACCIDENTS</b></p>	<p><b>CHILDREN MUST BE ACCOMPANIED BY AN ADULT ONLY SERVICE DOGS ALLOWED</b></p>																												

associated with the Rock Show this Year, CVRMS is Hosting the:

## AMERICAN ASSOCIATION OF MINERALOGICAL SOCIETIES' NATIONAL SHOW

and the

## MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES ANNUAL MEETING

March 21-23, 2019 Ramada, Cedar Rapids

see <https://www.cedarvalleyrockclub.org/AFMSHome.html> for details and registration

# "Bill's Big Bus Boogie" 2018 Milwaukee Public Museum

Photos from 2018 CVRMS trip to Milwaukee Public Museum



See these and 200 more museum photos at the CVRMS Holiday Party on Dec. 11

## 2018 Officers, Directors, and Committee Chairs

President .....	Marv Houg ( <a href="mailto:m_houg@yahoo.com">m_houg@yahoo.com</a> ).....	(319)364-2868
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Imm. Past Pres. ...	Sharon Sonnleitner ( <a href="mailto:sonnb@aol.com">sonnb@aol.com</a> ) .....	396-4016
Director '18 .....	Bill Desmarais ( <a href="mailto:desmarais_3@msn.com">desmarais_3@msn.com</a> ) .....	365-0612
Director '19 .....	Rick Austin ( <a href="mailto:rcaustin9@gmail.com">rcaustin9@gmail.com</a> ) .....	361-5410
Director '20 .....	Jay Vavra ( <a href="mailto:vavrjij@gmail.com">vavrjij@gmail.com</a> ).....	447-9288
Sunshine.....	Dolores Slade ( <a href="mailto:doloresdslade@aol.com">doloresdslade@aol.com</a> ) .....	351-5559
Hospitality .....	Karen Desmarais ( <a href="mailto:desmarais_3@msn.com">desmarais_3@msn.com</a> ) .....	365-0612
Webmaster.....	Sharon Sonnleitner ( <a href="mailto:sonnb@aol.com">sonnb@aol.com</a> ) .....	396-4016

Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:15 p.m., at the Hiawatha Community Center in the Hiawatha City Hall, [101 Emmons St., Hiawatha IA](#). The December meeting is a potluck dinner held the 2nd Tuesday at 6:30. June, July, and August meetings are potlucks held at 6:30 p.m. at area parks on the 3rd Tuesday of each month

### CEDAR VALLEY ROCKS & MINERAL SOCIETY

CVRMS was organized for the purpose of studying the sciences of mineralogy, geology, and paleontology and the arts of lapidary and gemology. We are members of the Midwest (MWF) and American (AFMS) Federations. Membership is open to anyone who professes an interest in rocks and minerals.

**Annual dues are \$15.00 per family per calendar year. Dues can be sent to:**

**Dale Stout  
2237 Meadowbrook Dr. SE  
Cedar Rapids, IA 52403**

CVRMS website:  
[cedarvalleyrockclub.org](http://cedarvalleyrockclub.org)



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