Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS SEPTEMBER 2021 VOL. 48, ISSUE 09

Ray Anderson, Editor: rockdoc.anderson@gmail.com

Next CVRMS Meeting Tues. September 21 7:15 pm

we're Returning To the Hiawatha Community Center

-— with Pandemic Precautions —-

to attend the meeting VACCINATION RECOMMENDED

while in the building you MUST BE MASKED

and PRACTICE SOCIAL DISTANCING

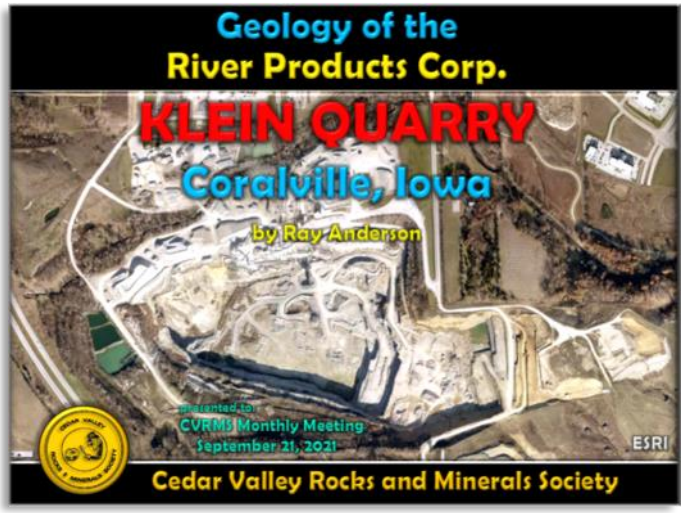
No snacks will be served

Ray Anderson will present a program on the

Geology of the Klein Quarry

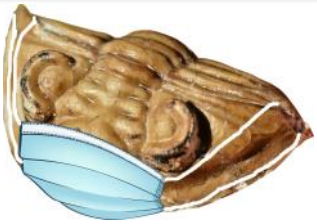
Coralville, Iowa

"Learn all about the geologic history of our favorite field trip locality"



Things to Bring To The Meeting:

- **Some Rocks to Show Off (socially distanced)**
- **Some Stories to Tell about what's new in your lives**
  (we haven't seen you for 17 months!)
- **Ideas for Future Meetings and Trips**



That sea sponge hanging in your shower may be able to trace its evolutionary lineage to nearly a billion years ago, according to fossils that could be the oldest examples of animal life on Earth. The **890-million-year-old** fossils of what may be ancient sponges were found in Canada's Northwest Territories, and their tiny and delicately branching tendrils are invisible to the naked eye. But under a microscope, the preserved organic tissue revealed a mesh-like structure that was strikingly similar to that of skeleton fibers in modern bath sponges, which are part of a soft-bodied-sponge group known as **keratose demosponges,** or horny sponges. Paleontologists already consider sponges to be good candidates for the earliest form of animal life. If this analysis is correct and the Canadian fossils truly represent ancient sponges, they would predate the oldest known sponge fossils by about 350 million years, according to a new study. The bizarre fossils were first noticed in the early 1990s, while examining samples of massive fossil reefs that were built by ancient cyanobacteria. When scientists peered through a microscope at thin slices of the rocks, they saw something in a handful of samples "*that was a lot more complicated than cyanobacteria*." They thought it looked a bit like some sponge fossils from younger rocks. Prior to around 580 million years ago, there's very little physical evidence of animals, but that doesn't mean they didn't exist; soft-bodied animals usually don't fossilize well. In 2018, traces of cholesterol in a fossil dating to 558 million years ago enabled researchers to identify a bizarre soft-bodied creature called ***Dickinsonia*** as an animal. When physical fossils are scarce, scientists studying Earth's evolutionary past often turn to the molecular clock. By evaluating differences in the DNA of modern organisms, alongside rates of mutation, the molecular clock method can give an estimate of when animals in a given group may have first evolved. "*If I'm correct in my interpretations of this material, animals emerged long before the appearance of traditional animal fossils — they had a long prehistory,*" said David Bottjer, a professor of Earth sciences at the University of Southern California. Though spicules are the most common fossil markers for sponges, many modern sponges don't have spicules, and the discovery of what is **possibly an 890-million-year-old sponge** that shares that trait is *an important find*. If you look at the body of a fossil sponge microscopically, it has this characteristic microstructure, which was described and characterized and fully affiliated with the "*spongin [a type of collagen protein] skeleton in modern keratose demosponges*," Turner said. "*And it's the identical structure to what I have.*" She described the fossils in a study published July 28 in the journal Nature. https://www.livescience.com/oldest-animal-life-fossils-sponges.html

CVRMS Board Minutes Aug. 24

Virtual Meeting on Zoom,

MEMBERS SIGNED IN: Mav Houg, Dale Stout, Dell James, Kim Kleckner, Jay Vavra, Sharon Sonnleitner, Ray Anderson Bill Desmarais.

MEETING CALLED TO ORDER: by Marv at 7:05 pm.

MINUTES REVIEWED AS PUBLISHED. Motion to accept by Jay 2nd by Dale. Minutes approved as published.

AUCTION: General discussion regarding auction. Sharon reported about 1279 items for auction. Saturday, food will be furnished by food truck and also includes the dinner for evening meal. On Sunday there will be meals available via microwaveable meals. The club will furnish, at a charge, along with drinks, cookies, cake, and chips. Arrangements made by Dale and Kim to pick up Gil Norris's books and rocks. We will need lots of flats for items-Kim offered to provide them. We will need a rental truck for Thursday. Bill agreed to drive. Discussion regarding the need for masks and sanitizing stations. We should list the use of masks, sanitizing and social distancing encouraged on flyer.

AJ and Bill will supply security for the night time. Dell has already notified *Collectors Journal* for advertising ads.

[Set-up starts 8:30 am Friday—Editor]

2021 SHOW: Kim has taken care of social media. Dell will take care of Collectors Journal and *TidBits* for 2021 show. Ray has finished the posters. Sharon reported on the conversations with Hawk Eye. They no longer have overnight camping but since we have a couple dealers who camp overnight, she will talk to them about making exceptions. There have many improvements to the place. New roof, bathrooms redone and will provide a food truck operating out of the kitchen. The club guarantees $500 gross. They have sanitizing stations located conveniently throughout the building. Discussion about requiring masks for entry. Discussion varied from no mask, no entry, to requiring proof of vaccination status ,and if you cannot follow the rules, stay home. The board elected to allow common sense approach with lots of masks provided, sanitizing stations and social distancing as much as possible.

2022 SHOW MARCH 26-27, 2022: Theme is tentatively set as Iowa's Industrial Minerals. This is tentative meaning that it could be changed.

OTHER BUSINESS: Board meetings will be held at Marv's place given his health status improving.

TAKO Event October 2 will still happen. Meet at the recycle center by Klein Quarry 8:30 and will last until about 11:30.

Field Trips—Due to Marv being under the weather has not worked on future field trips. Discussion about Russell Wildlife Area having blastoids, north of Oskaloosa. Marv will check it.

Next meeting will be held at the Hiawatha Community center On September 21. Masks required. No snacks will be served.

MOTION TO ADJOURN: by Dell second by Dale.

8:30 p.m. MEETING ADJOURNED

Respectfully submitted,
Dell James, Secretary

What would happen if the moon were twice as close to Earth?

In the 2003 Jim Carrey movie "***Bruce Almighty,***" Carrey's character suddenly acquires God-like powers, and uses those powers to lasso the full moon and pull it closer to Earth to woo his beloved. Later in the movie, background shots show TV news reports about massive, unprecedented flooding around the world. What would happen if the moon were twice as close to Earth as it is today? In fact, the flooding scenario from the movie isn't far from what might actually happen if the moon were suddenly much closer to Earth, said Neil Comins, a physicist at the University of Maine. The best-known effect of the moon is its gravitational pull on Earth's oceans, which results in two high tides and two low tides every day. But if the moon were half the distance from Earth as it is now, the tides would be eight times higher, Comins told Live Science. Some islands would be completely underwater for much of the day, and populated coastlines would likely become uninhabitable because of the high tides, he added. But higher ocean tides wouldn't be the only result of a closer moon. The moon also has a tidal effect on Earth's ***land***. If the moon were suddenly twice as close to Earth, the effect would be like hitting a gong with a mallet. Waves of energy would reverberate through the planet due to the sudden increased strength of the moon's gravitational pull. And that sudden whack of gravity would impact the Earth's crust, possibly triggering more earthquakes and more volcanic eruptions. Take, for example, Jupiter's moon Io, the most volcanically active world in the solar system. Io's volcanism results from the push and pull from the gravity of Jupiter and two of its other moons. Earth might see a similar fate if the moon were suddenly half as close. Along with all the sudden buckling of the planet's crust, Earth's spin would slow over time, because as the moon's gravity pulls the oceans, the resulting friction between the ocean floor and water slows Earth's spin. Today, Earth's rotation is slowing by about one-thousandth of a second per century. And what if the moon were to slowly spiral toward Earth, rather than just moving suddenly? The planet's crust and tides would shift more gradually, hopefully letting life adjust. The longer days and nights could change our climate and drive evolutionary changes in multiple ways. Animals would have to adapt to a brighter moon at night. For example, prey might have to learn how to hide better at night, as predators might have more light when hunting. Of course, even if that did happen, it would still take many, many years for the moon to get half the distance away as it is now, so Earth wouldn't feel the effects right away.

https://www.livescience.com/what-if-moon-closer-to-earth.html

Spotlight Gemstone: Sapphire

September's Birth Stone

Sapphire, the birthstone for September and the gem of the 5th and 45th anniversaries, is a gemstone variety of the mineral corundum, an aluminium oxide (Al_2O_3). It frequently contains traces of iron, titanium, chromium, copper, or magnesium. Typically associated with the color blue, sapphires can also naturally occur in a wide variety of colors such as blue, yellow, purple, orange, green colors (which are also called "*fancy sapphires*"). "*Parti sapphires*" are those sapphires which show two or more colors in a single stone. The only color which sapphire cannot be is red (*red colored corundum is called ruby*). Commonly, natural sapphires are cut and polished into gemstones and worn in jewelry. They also may be created synthetically in laboratories for industrial or decorative purposes in large crystal boules. Because of the remarkable hardness of sapphires, 9 on the Mohs scale (the third hardest mineral, after diamond at 10 and moissanite at 9.5), sapphires are also used in some non-ornamental applications, including infrared optical components, wristwatch crystals and movement bearings, and very thin electronic wafers used as insulating substrates in special-purpose solid-state electronics. The sapphire is one of the three gem-varieties of corundum, the other two being *ruby* (defined as corundum in a shade of red) and *padparadscha* (a pinkish orange variety). Although blue is their most well-known color, sapphires may also be colorless or shades of gray and black. Blue sapphires are evaluated based upon the purity of their primary hue. Purple, violet, and green are the most common secondary hues found in blue sapphires. Blue sapphires with up to 15% violet or purple are generally said to be of fine quality. Blue sapphires with any amount of green as a secondary hue are not considered to be fine quality. The 423-carat (84.6 g) Logan sapphire in the National Museum of Natural History, in Washington, D.C., is one of the largest faceted gem-quality blue sapphires in existence.

What in the World?

What in the World? Is this blue canal and what is its story??

August's Photo

Last month's "*What in the World*" photo showed an Upper Devonian cystoid, *Adocetocystis williamsi,* collected at the Williams Quarry near Clarmont (Fayette Co.) in 1967 by former Iowa State Geologist Don Koch. The echinoderm's name was formalized in 1968 by Harrell Strimple and Don Koch. The fossil came from the *Agelacrinites zone* at the base of the Mason City Member of the Shell Rock Formation.

ROCK CALENDAR
CVRMS EVENTS OF INTEREST

2021

Sept 18-19— CVRMS Auction
Amana RV Park and Event Center
Amana, Iowa
See Flyer on Page 10

Sept. 21 — CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
feature program
"Geology of Klein Quarry"
by Ray Anderson
** ***PANDEMIC PROTOCOLS WILL BE MANDATED*** **
More details on Page 1

Sept. 27 —3 Rock Clubs Monthly Program
ZOOM Presentation to be Announced
https://us02web.zoom.us/j/89524404665

Sept. 24-26 — Geode Fest
First Christian Church Parking Lot
3476 Main Street
Keokuk, Iowa
http://www.keokukiowatourism.org/event_calendar/geode_fest/index.php

Oct. 22-24 — MAPS 2021 Fossil Expo
Illinois State Fair Grounds
Springfield, Illinois
http://www.midamericapaleo.org/content/news/2021_Jan_Prelim_Announce.pdf

Nov. 6-7 — CVRMS Rks, Fos, & Min Show
Hawkeye Downs
Cedar Rapids, Iowa
more details to follow

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, 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.

Today we have another "*twofer*" ask a geologist. The first question came from Barry Jones who noted that *"Iowa seems to have an abundance of gravel acceptable for aggregates used in concrete and asphalt. However, there is a nuisance rock often causing noticeable cosmetic damage to sidewalks and driveways. Some contractors refer to it as ironstone because of the rusty stains it leaves when weathering out of the matrix*". He asks "*What is this rock called and where does it comes from?* "

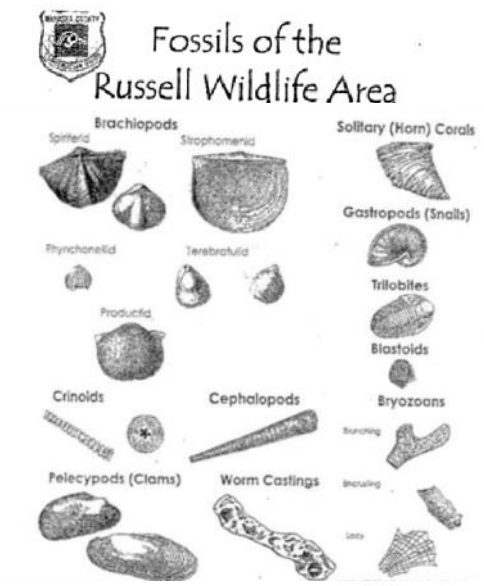
To answer Barry's question I consulted my long-time friend and fellow geologist Brian Gossman, Chief Geologist at the Iowa Department of Transportation's Construction and Materials Section. Brian said that "*the most common cause is "iron oxide" and other deleterious materials in the fine and coarse aggregate from gravel pits. IDOT has fine aggregate specification limits on deleterious materials which includes coal, shale, iron oxide spall, organics etc. Many of the gravel sources in NW Iowa have coarse aggregate concrete stone approvals so much of the paving in that part of the state can be quite ugly. Commercial concrete often uses local pit materials so some areas are worse than others. Pyrite in crushed coarse aggregate can also cause rusty pop outs."* So a variety of materials that contain iron oxide or iron sulfides are usually responsible for these ugly rust spots in concrete.

The second question came from Jack Gilmore, when he found a rock sample in my collection labeled Mariposite. He asked, "*What is Mariposite??"* We did a little research and thought you might find the answer interesting.

Mariposite is an informal name used for green micas and a variety of rocks that contain them. The name has appeared in the geological literature since the late 1800s. A distinctive green mica, the mineral has been referred to by the varietal names **mariposite** and **fuchsite,** but is most appropriately classified as "***chromian phengite***" or "***green mica***." The name originates from the community of Mariposa, California. Green mica and green rocks that derive their color from green mica are seen in a few spectacular outcrops in that area. During the California Gold Rush, many prospectors learned that mariposite rocks were often sources of gold. Looking for green and white rocks became a prospecting method that sometimes resulted in success. Making a positive identification, to the species level, of tiny grains of mica in the field can be difficult to impossible. It was problematic in a well-equipped lab in the late 1800s and early 1900s. Even today, positive identification can require chemical, mineralogical, or microscopic testing by an experienced mineralogist. The name "**mariposite**" is also used for rocks. The rocks contain enough particles of green mica to produce a green color. These rocks are metamorphic, having been altered by hydrothermal activity, and they are usually thought to have been serpentinites before being metamorphically altered. The green mica usually accounts for a small percentage of the rock, with the major constituents being quartz, calcite, dolomite, ankerite or barite. Mariposite is most important for being an ore of gold and a source of placer gold. It has been cut as a dimension stone to produce cemetery markers, fireplaces, facing stone and other architectural works. It is a material that can be used where strength and weather resistance are not required. Mariposite will weather to a muddy brown color that can disappoint people who use it for an exterior project. Mariposite is sometimes used to produce crushed stone. This beautiful material is used as landscape stone in some parts of California by people who are lucky enough to obtain it. Some people who know about mariposite's association with the California Mother Lode will be tempted to pick up a few pieces to look for the yellow metal. But, more often they will find pyrite. Mariposite has many lapidary uses. It is used to make attractive cabochons, spheres, paperweights, bookends, and tumbled stones. Anyone who uses mariposite in lapidary projects must be mindful that the rock is composed of several minerals which may have incompetent boundaries, different hardnesses, and polish to different degrees of luster. The best specimens for lapidary use are solid pieces made up mostly of quartz, without any signs of weathering.

New Location to Hunt for Fossils in Iowa: the Russell Wildlife Area

Finding a location to legally search for fossils in Iowa has always been a problem. With very few fossil sites to choose from, you will be happy to learn of another, the **Russell Wildlife Area** north of Oskaloosa in Mahaska County Iowa. In this 220-acre county park you will be able to pick up a whole handful of various fossilized water plants and animal; ***and you're even allowed to bring them home!*** The Russell Wildlife Area has a unique history; it used to be a limestone quarry, developed in Mississippian rocks of the St. Louis/Pella Fms., where many tons of rock was mined to obtain limestone for crushing. The pits are now filled with water, creating five beautiful ponds and excellent habitat for wildlife. In the process of producing the limestone, the crews created spoil piles of mixed dirt and rock that are loaded with fossils. Available fossils include brachiopods, crinoids, horn corals, bryozoans, and other marine fossils. Visitors are allowed to bring a small hand trowel to dig with, but generally just scanning the surface of the ground yields plenty of fossils. Train your eye to look for small rocks with lines on them, or cylindrical shapes, or branching patterns. They're the same color as all the surrounding gravel and rocks, but the shape, texture, and surface patterns are definitely unique. Park at the County Conservation Center's maintenance building and head toward the shelter house. Take the posted trail and head for the exposed dirt and rock mix on the east banks of Pond 4 or the southern trail (a grass and gravel maintenance road) between Ponds 2 and 4 where you'll see the exposed spoil piles along the road. These are some of the best places to hunt for fossils, but any exposed, gravelly area may include fossils. Before you go, you might want to stop by the folks at the Mahaska County Environmental Learning Center in nearby Oskaloosa where you can learn more about the fossils and get more tips on finding the best spots to hunt fossils. The staff and displays are incredible resources to get your treasure hunt off on the right foot!



https://www.onlyinyourstate.com/iowa/russell-wildlife-fossils-ia/

What Is Watermelon Tourmaline?

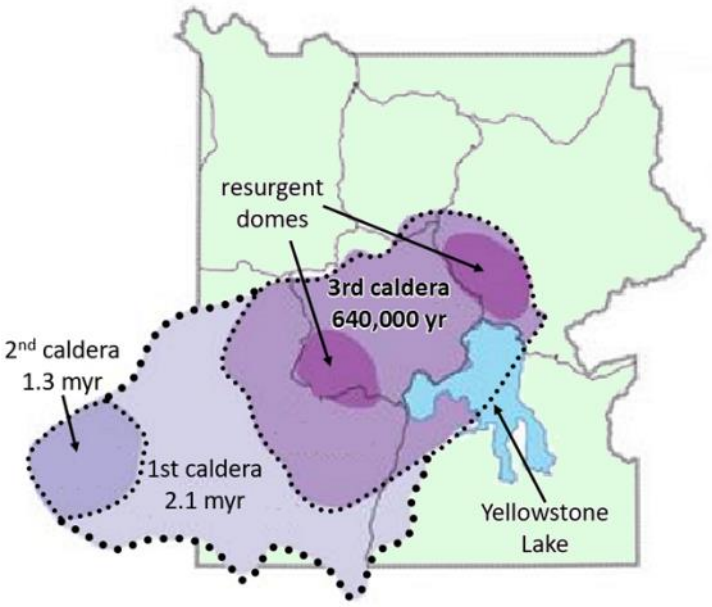
Watermelon tourmaline is a variety of concentrically color-zoned tourmaline with red interiors and green exteriors and is distinct from longitudinal bi-color or polychrome zonation. All colored tourmaline gems display *pleochroism* (meaning their color changes when viewed at different angles). In some Tourmaline gems, this effect is hardly noticeable, while in others it is strongly apparent. Gemstone cutters must take this into account when cutting a Tourmaline, so that the finished gem brings out its best color. As the name suggests, watermelon tourmaline displays banded colors that resemble a slice of ripe watermelon. The red or pink center is surrounded by a rim of green, often separated by a sliver of pale pink or white. The brightly colored zones can also occur at either end of the gem although there is some debate as to whether these stones should be classified as watermelon or simply bi-color tourmalines. Watermelon tourmaline crystals tend to form with a distinctive rounded triangular shape, as demonstrated by the slice of a crystal pictured to the left. Watermelon tourmalines with vivid, clearly separated colors are very rare and command high prices. Matthew Morrell said: "*Clean stones with good crystal in the 4-7 carats range, with an even distribution of each color, change hands in Europe at between $500-$600 per carat.*" Cutting the stone into slices like a loaf of bread rather than faceting the rough often enhances the resemblance to a real watermelon. Their complex structure makes tourmalines very difficult to cut. A great deal of expertise is required to identify areas of tension within the stone, which can cause it to crack during the cutting process. The bi-colored and multi-colored zoning that we so often see in tourmaline gems happens when the trace elements change in concentration or composition during a crystal's growth. These unique gems can have colored zones across the length of the crystal, or they can have a core of one color and an outer edge of another color. A single tourmaline crystal can contain up to 15 different colors or shades; no wonder it has been nicknamed the "***Rainbow Gem***". In watermelon tourmaline, pink and green Elbaite crystals are found in the same stone, and these color zones provide a visual record of its formation process. As the watermelon tourmaline crystal grows and thickens, it is exposed to different minerals such as manganese and lithium, which cause the gem to change color from a pink center through a pale zone to the green rind.

A slice of watermelon tourmaline

https://www.geologyin.com/2021/07/watermelon-tourmaline-what-is.html

More Than 1,000 Earthquakes Swarmed Yellowstone Park in July

The Earth is rumbling beneath Yellowstone National Park again, with swarms of **more than 1,000 earthquakes** recorded in the region in July 2021, according to a new U.S. Geological Survey (USGS) report. This is the most seismic activity the park has seen in a single month since June 2017, when a swarm of more than 1,100 rattled the area, the report said. Fortunately, these earthquakes were minor ones, with only four temblors measuring in the magnitude-3 range (strong enough to be felt, but unlikely to cause any damage), and none of the quakes signal that the **supervolcano underneath** the park is likely to blow, park seismologists said. "***While above average, this level of seismicity is not unprecedented, and it does not reflect magmatic activity,*" according to the USGS report. "*If magmatic activity were the cause of the quakes, we would expect to see other indicators, like changes in deformation style or thermal/gas emissions, but no such variations were detected.***" Throughout July 2021, the University of Utah Seismograph Stations, which are responsible for monitoring and analyzing quakes in the Yellowstone park region, recorded a total of 1,008 earthquakes in the area. These quakes came in a series of seven swarms, with the most energetic event occurring on July 16. According to the USGS, at least 764 quakes rattled the ground deep below Yellowstone Lake that day, including a magnitude 3.6 earthquake (the single largest of the month). The month's remaining six swarms were all smaller, including between 12 and 40 earthquakes apiece, all measuring below magnitude 3, the report said. These quakes are nothing to worry about, the USGS added, noting that the earth-shaking is likely the result of motion on preexisting faults below the park. Fault movements can be stimulated by melting snow, which increases the amount of groundwater seeping under the park and increases pressure levels underground, the researchers said. Yellowstone is one of the most seismically active regions in the U.S.; the area is typically hit by anywhere from 700 to 3,000 earthquakes a year, most of which are imperceptible to visitors, according to the National Park Service. The biggest quake on record in Yellowstone was the magnitude-7.3 Hebgen Lake quake, in 1959. Why so shaky? The park sits atop a network of fault lines associated with an enormous volcano buried deep beneath the ground (this volcano last erupted about 70,000 years ago, according to the USGS). Earthquakes occur as the region's fault lines stretch apart, and as magma, water and gas move beneath the surface. These features also feed the park's reliable geysers and steamy hot springs. The Yellowstone volcano has experienced *supereruptions* several times in the past, with gargantuan eruptions occurring every 725,000 years or so. **If this schedule is accurate, the park is due for another big eruption in about 100,000 years.** Such an eruption would devastate the entire United States, clogging rivers with ash across the continent and causing widespread drought and famine. Since the area of northwestern Wyoming drifted over the Yellowstone Hot Spot there have been 3 super-eruptions The first major eruption, which occurred 2.1 million years ago, is among the largest volcanic eruptions known, covering over 5,790 square miles with ash. The most recent major eruption, 640,000 years ago, caused the ground to collapse into the magma reservoir, leaving a giant caldera. Subsequent lava flows filled in much of the caldera, and it is now measured at 30 x 45 miles. If you look at a modern park map, you can see the outline of the caldera. "*The Yellowstone volcanic system has experienced two super-eruptions, or events resulting in accumulation of more than 250 cubic miles of debris. That's enough material to bury the state of Texas five feet deep!*" said Jake Lowenstern of the U.S. Geological Survey. "*Any volcanic system that's resulted in a supereruption is dubbed a supervolcano*." Lowenstern explained that Yellowstone's geysers and hot springs are a direct consequence of the volcanic system. These features exist because of the high heat discharge from the molten rock that fuels the volcanic eruptions. Heat is conducted from the molten rock (found four to five miles beneath the surface of the park) upward to the groundwater system, creating spouting geysers and bubbling hot springs. https://www.geologyin.com/2021/08/more-than-1000-earthquakes-swarmed.html



Volcanic calderas of Yellowstone Park

Italy's Mount Etna Volcano Just Keeps Growing, And Now It's Taller Than Ever

Gangi, Sicily, with Mount Etna in the background.
(Sandro Bisaro/Getty Images)

Mount Etna's southeastern crater has grown in height after six months of activity, Italy's volcano monitoring agency said Tuesday, making Europe's tallest active volcano taller than ever. The famous volcano's youngest and most active crater has risen to a new record of 11,000 feet above sea level, said INGV, the National Institute for Geophysics and Vulcanology, based in the Sicilian city of Catania. *"Thanks to the analysis and processing of satellite images, the southeast crater is now much higher than its "older brother," the northeast crater, for 40 years the undisputed peak of Etna,"* the INGV wrote in a press release. Some 50 episodes of ash and lava belching from the mouth of the crater since mid-February have led to a "*conspicuous transformation of the volcano's outline,*" with its dimensions calculated through satellite images, it said. The northeastern crater of Etna reached a record height of 10,990 feet in 1981, but a collapse at its edges reduced that to 10,912 feet, recorded in 2018. The crater has been churning out smoke and ash since February, while posing little danger to surrounding villages. Sicily's government estimated in July that over 300,000 tons of ash had been cleaned up so far. The ash has been a nuisance in surrounding areas, dirtying streets, slowing traffic and damaging crops. In Catania, a two-hour drive from the volcano, pensioner Tania Cannizzaro commented that Mount Etna was both beautiful and an annoyance, with ash sometimes falling "*like rain*". "*Depending on the wind, the rumblings of the volcano reach Catania and make the windows shake,*" she said, adding that the ashes turn the streets and balconies black. *"But there is also the spectacle, especially in the evening, when you see this red plume that moves."*
https://www.sciencealert.com/sicily-s-mount-etna-taller-than-ever-after-six-months-of-activity

World's Largest Sapphire Cluster 'Accidentally' Found in a Backyard in Sri Lanka

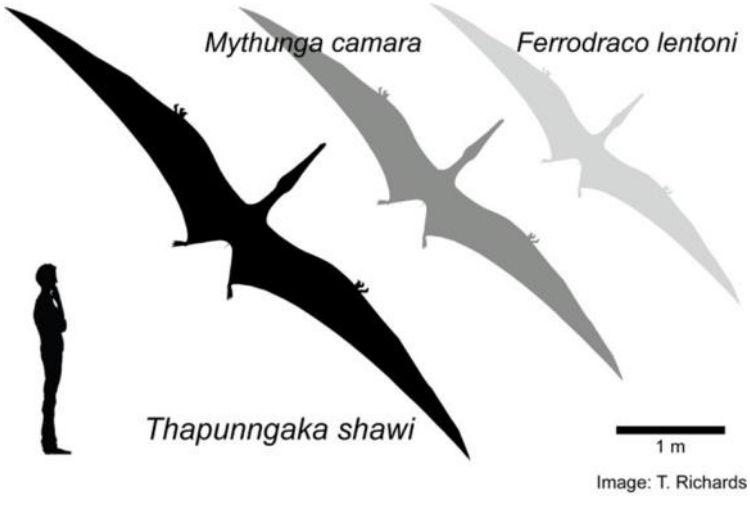
A star sapphire cluster worth up to **$100 million** has been discovered in a Sri Lankan man's backyard by workmen who were digging a well. A gem trader said the stone was found by workmen digging a well in his home in the gem-rich Ratnapura area. Experts say the stone, which is pale blue in color, has an estimated value of up to $100 million in the international market. The cluster weighs around **1125 lbs or 2.5 million carats** and has been named the "***Serendipity Sapphire***." "*The person who was digging the well alerted us about some rare stones. Later we stumbled on this huge specimen,*" Mr Gamage, the owner of the stone, said. He did not want to give his full name or location for security reasons. He is a third-generation gem trader, informed authorities about the find, but it took more than a year to clean the stone of mud and other impurities before they could analyze and certify it. During the cleaning process, Mr Gamage said some stones fell out of the cluster and they were found to be high quality star sapphires. While not all stones inside the cluster may receive such a grading, the sheer size of the Serendipity Sapphire renders it extremely rare. Ratnapura, which means city of gems in Sinhalese, is known as the gem capital of the South Asian country. Other valuable stones have been found there in the past. Sri Lanka is a leading exporter of sapphires and other precious gems. *"I have never seen such a large specimen before. This was probably formed around 400 million years ago," "It is a special star sapphire specimen, probably the biggest in the world. Given the size and its value, we think it will interest private collectors or museums,"* Thilak Weerasinghe, the Chairman of the National Gem and Jewellery Authority of Sri Lanka, said. https://www.geologyin.com/2021/07/worlds-largest-sapphire-cluster.html

Close-up image of a star sapphire in the cluster.

A Terrifying 'Dragon' Was the Largest Known Flying Reptile of Ancient Australia

With a 23-foot wingspan, and a mouth bristling with fangs, a newly discovered pterosaur would have ruled the skies over Australia's northeast around 110 million years ago. It's the **largest species of pterosaur ever found on the continent**, an extremely important find that contributes to our understanding of pterosaur diversity in Australia. And it would have been absolutely fearsome! "*It's the closest thing we have to a real life dragon*," said paleontologist Tim Richards of the University of Queensland in Australia. *"The new pterosaur, which we named **Thapunngaka shawi**, would have been a fearsome beast, with a spear-like mouth and a wingspan around seven meters (23 feet). It was essentially just a skull with a long neck, bolted on a pair of long wings. This thing would have been quite savage. It would have cast a great shadow over some quivering little dinosaur that wouldn't have heard it until it was too late."* Pterosaur remains in Australia are extremely rare. Like today's birds, their bones - optimized for flight - were hollow and brittle, and thus very few have survived to the present day. Fewer than 20 specimens have been described from the continent, and only three, prior to *T. shawi*, had been named. Also, only two Australian pterosaurs belonged to a group known as the anhanguerian pterosaurs, both hailing from the northeastern state of Queensland. *T. shawi* marks the third anhanguerian hailing from Australia; it's also from Queensland. Its description is based on a fragment of lower jaw, and what we know of other anhanguerian pterosaurs. It was named for the fossicker who discovered it, Len Shaw, and incorporates words from the language of the First Nations people who inhabited the region, the Wanamara Nation. "*The genus name, Thapunngaka, incorporates thapun [ta-boon] and ngaka [nga-ga], the Wanamara words for 'spear' and 'mouth', respectively,*" said paleontologist Steve Salisbury of the University of Queensland. According to the team's reconstruction, *T. shawi*'s skull would have been around a meter long (3.3 feet), with around 40 teeth. The beast would have flown above the inland Eromanga Sea that once dominated eastern Australia, using its long, powerful jaw to pluck fish from the water. Of particular interest, the researchers found, was a large bony crest on the bottom of the jaw. Based on what we know of anhanguerians, the animal's top jaw also sported such a crest. "*These crests probably played a role in the flight dynamics of these creatures, and hopefully future research will deliver more definitive answers,*" Salisbury said. It's from this crest that the researchers estimated the pterosaur's size - it is, they said, the largest mandibular crest known from any anhanguerian. If their estimations are correct, *T. shawi* would be the third largest anhanguerian pterosaur known worldwide. This suggests that Australian pterosaurs rivaled contemporaneous species from other continents in terms of size. In addition, the anatomical similarities between the jawbone of *T. shawi* and those of other Australian pterosaurs suggest there may have been a local pterosaur species diversification around the Eromanga sea. "*It's quite amazing fossils of these animals exist at all,*" Richards said. "*By world standards, the Australian pterosaur record is poor, but the discovery of Thapunngaka contributes greatly to our understanding of Australian pterosaur diversity.*" https://www.sciencealert.com/fearsome-dragon-was-the-largest-known-flying-reptile-to-soar-australia-s-skies

Artist's impression of an anhanguerian like T. shawi.



Hypothetical outline of *Thapunngaka shawi*. (Tim Richards)

2021 Auction Venue - Amana, Iowa

The CEDAR VALLEY ROCKS & MINERALS SOCIETY Presents

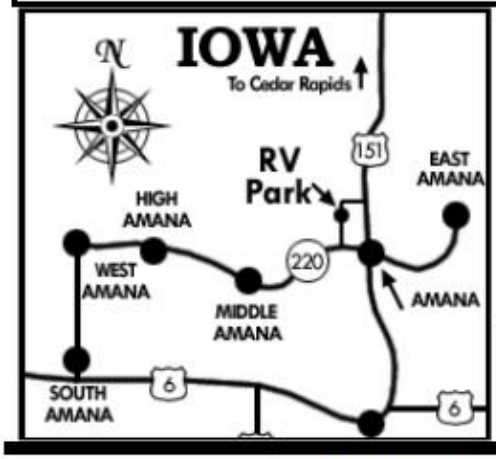
A TWO-DAY ROCK and MINERAL AUCTION

Amana RV Park and Event Center, 3850 C St, Amana, Iowa 52203

Saturday, September 18 – 9:00 a.m. - 7 p.m.?

Sunday, September 19 – 9:00 a.m. – 3 p.m.?

Viewing Hours: Fri., Sept. 17, from 5:00 to 7:30 p.m.; Sat. at 7:30 a.m.; Sun at 8:00



APPROXIMATELY
1,200 LOTS
From Several Collections
Minerals, Rough, Fossils
Equipment, Books
Many Excellent Specimens

HOT FOOD AVAILABLE
CAMPING AVAILABLE
(www.amanarvpark.com)

THE FOLLOWING IS A PARTIAL LIST OF ITEMS TO BE AUCTIONED

EQUIPMENT WILL SELL AT 2:00 ON SATURDAY

ROCKS & MINERALS

AGATE: Baker Ranch Thunderegg centers pairs; Big Diggins rough; Blue Lace (Namibia, South Africa); Carnelian; Coconut Thundereggs rough; Confetti rough; Coldwater; Fire rough; Green tree; Kentucky slabs, some large and rough; Keswick; Laguna; Lake Superior (1200 lbs+); Polyhedroids; Mexican; Missouri Lace; Red Hots Thunderegg pairs; Yellow Moss rough
Amethyst
Amethyst Geode, approx. 23" x 13"
Apatite
Azurite + malachite, etc., on matrix
Barite, from Linwood
Bismuth
Calcite with Marcasite or Barite, Linwood
Chalcedony roses AZ/NM
Chrysocolla
Chrysoprase
Copper Oxides, AZ-MEX parrot wing type
Faceting Specimens (mineral, crystal, gem)
Fluorescent Specimens (LW & SW)
Fluorite, green (purple UV)
Fluorite, large specimen
Galena
GEM ROUGH: Grape jelly amethyst; Peridot; Aquamarine (small parcel of each)
Geodes
Gold mine ore specimens
Jasper
Linwood Mine Minerals
Malachite
Millerite on Calcite, Iowa City
Obsidian
Pecos Diamond (orange qtz rosettes) lg parcel
Planerite
Rainforest jasper (green ryolite)
Raspberry garnet crystals
Rhodocrosite
Septarian nodules
Smithsonite
Sodalite
Tourmaline & rubellite
Turquoise on Matrix'
Waterloo, IA, minerals
Wavelite, AR

FOSSILS

Ammonite halves, polished
Fossils
Mazon Creek halves
Oligocene Fossil teeth/bones, NE
Petrified Wood
Petrified Palmwood
Trilobites in matrix, NY (small)

MISC.

Artifacts
Fossil Books (lots)
Shells

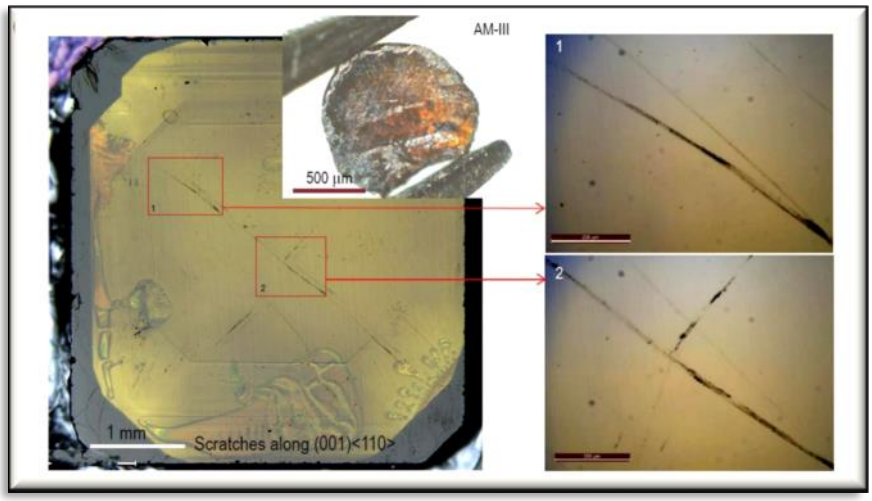
EQUIPMENT (will sell at 2:00 on Sat.)

Antique (early1900's) Bausch/Lomb(?) black iron/brass microscope with original wood storage box (simple) reflector type, full functional - good shape (2 quantity)
Geode Cracker (Hydraulic Pipe Cutter, mounted on cart; cracks up to 26" diameter)
Mineral Microscopes from early 1990s (2 quantity)
Tumbler (Diamond Pacific Extra Heavy Duty 65 lb. Capacity Commercial Rock Tumbler)
Water-fed grinder/polisher with polishing pads

I.D. will be required to obtain buying number. Cash, credit card (2.75% convenience fee) or good check. Two forms of I.D. required for all checks.
7% tax added to all sales. Buyers who provide proof of tax permits are exempt.
No items removed until settled for on day of sale. Not responsible for accidents, theft or damage.
Announcements day of sale take precedence over advertising.
CONTACTS: Marvin Houg 319-364-2868, m_houg@yahoo.com or Sharon Sonnleitner 319-396-4016, sonnb@aol.com; cedarvalleyrockclub.org

Scientists Discover How to Make Glass So Hard, It Can Even Scratch Diamond

Down on an atomic level, glass is a jumbled mess of atoms, which makes it easily prone to distortion and cracking. Now, chemists have discovered how to arrange the atoms within glass in such a way, the resulting material can even rival the strength of diamonds. A team of materials scientists from Yanshan University in China has discovered the critical proportion of crystallized and amorphous carbon needed to create a glass with remarkable properties that won't weaken under intense pressure. The mechanical properties of a material often come down to the way its building blocks link together. Diamond's notorious toughness is determined by the four bonds every single one of its carbon atoms makes with its neighbors. Though these bonds make for a solid bridge, they also don't leave any electrons spare to carry a current, effectively making diamond an insulator. Glassy solids don't have repeating patterns, at least on a general scale. Their overall structure is more or less what you get when a liquid's particles all drop in place once the temperature drops low enough. Depending on the constituent ingredients, however, glassy materials can have a surprising degree of structure up close. Their disordered arrangement also allows for a wide range of optical and mechanical properties that makes them better suited for certain technologies. Glasses that are based on metals should combine the advantages of both, lending a degree of strength that crystalline metals don't have, while still being conductive. Determining what a glassy state of carbon might behave like, however, is tricky to predict based on theory alone. So the Yanshan researchers experimented, squishing spheres of carbon atoms called "*buckyballs*" under intense pressure of around 25 gigapascals (just under 250,000 atmospheres) and then baking the mush at temperatures between about 1,800 to 2,200 degrees Fahrenheit). Subjecting the products, dubbed AM-I, II, and III, to a litany of tests, the chemists mapped the way the atoms bonded with one another, showing they all operated as a semiconductor on a level comparable with amorphous silicon. But it was the mechanical properties of the third result that truly stood out. Diamond is characteristically known as one of the hardest known substances. A common measure of hardness, called the Vickers hardness test, actually uses a diamond tip to indent material. The harder the material, the greater the force (measured in gigapascals) required to leave a sizable mark. Scratching another diamond might require somewhere between 60 and 100 gigapascals, depending on whether it's natural or made with care in a lab. The glassy material AM-III measured somewhere between 110 and 116 gigapascals on the Vickers hardness test, making it the hardest amorphous solid to date. Running a slither of the substance along the flat face of a natural diamond left a clear score line. The resulting transparent material is not only hard but also a semiconductor, with a bandgap range almost as effective as silicon, the main semiconductor used in electronics. So besides bulletproof glass, it could prove useful in the solar panel industry where its properties can shine by allowing sunlight to reach photovoltaic cells, while also enhancing the lifespan of the product. Producing enough of the material to use widely in commercial processes would be an expense few would fork out on right now. In time, enough might be made to serve as a replacement for silicon transistors used in high-pressure environments. Given how experimental this glass development was, it's possible there's more to be found by squashing and cooking other carbon allotropes, such as graphene, at a range of pressures and temperatures. Materials science is well into the carbon age of late, coming up with ingenious new ways to put mechanical and electrical properties of variously-arranged carbon atoms to work. How we'll use AM-III is hard to say right now, but one day it just might become an electrical engineer's best friend. Scientists have long been working to develop the strongest glass, and in 2016, scientists at the University of Southern California created a form of metallic glass made from iron that is stronger than titanium. Tests showed the material, which is called SAM2X5-630, is 588 times more resistant to damage than stainless steel and has twice the resistance of tungsten carbide ceramic used in body armor. While the new material is not yet transparent enough to be used to make super-hard glass screens, it could be used to create protective casing for mobile devices that would bounce when dropped. For example, using the material to replace the aluminum sides and back seen in many mobiles such as the iPhone could make the device far more resistant to smashing. https://www.sciencealert.com/this-record-new-type-of-glass-is-so-hard-it-can-even-scratch-diamond



AM-III leaving its mark on a diamond (Zhang, et al., National Science Review, 2021)

2021 Officers, Directors, and Committee Chairs

President	Marv Houg (m_houg@yahoo.com)	(319)364-2868
Vice President.	Ray Anderson (rockdoc.anderson@gmail.com)	337-2798
Treasurer	Dale Stout (dhstout55@aol.com)	365-7798
Secretary	Dell James (cycladelics@msn.com)	446-7591
Editor	Ray Anderson (rockdoc.anderson@gmail.com)	337-2798
Liaison	Kim Kleckner (ibjeepn2@gmail.com)	560-5185
Imm. Past Pres.	Sharon Sonnleitner (sonnb@aol.com)	396-4016
Director '21	Bill Desmarais (desmarais_3@msn.com)	365-0612
Director '22	Toby Jordan (rejordan79@msn.com)	360-2762
Director '23	Jay Vavra (vavrajj@gmail.com)	447-9288
Sunshine	Dolores Slade (doloresdslade@aol.com)	351-5559
Hospitality	Karen Desmarais (desmarais_3@msn.com)	365-0612
Webmaster	Sharon Sonnleitner (sonnb@aol.com)	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. During the COVID emergency meetings will be via ZOOM. When the emergency is over, meetings will return to the Hiawatha Community Center in the Hiawatha City Hall, 101 Emmons St., Hiawatha IA. The December meeting is a potluck dinner held on the 1st 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

Ray Anderson, Editor
2155 Prairie du Chien Rd. NE
Iowa City, Iowa 52240-9620