

Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS

MAY 2023

VOL. 49, ISSUE 05

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

Next CVRMS Meeting

Tuesday May 16

Hiawatha Community Center
101 Emmons St., Hiawatha - 7:15 pm
educational presentations

by **Ray Anderson**

Cedar Valley Rocks and Minerals Society

*"Select YouTube Videos for
Information and Entertainment"*

Rockdoc Ray has selected shorter *YouTube* videos discussing various topics in Earth history, tectonics, minerals, and other topics that should be of interest to CVRMS members. If you have any topics that you are especially interested in, contact Ray with your ideas. He can always revise the schedule.

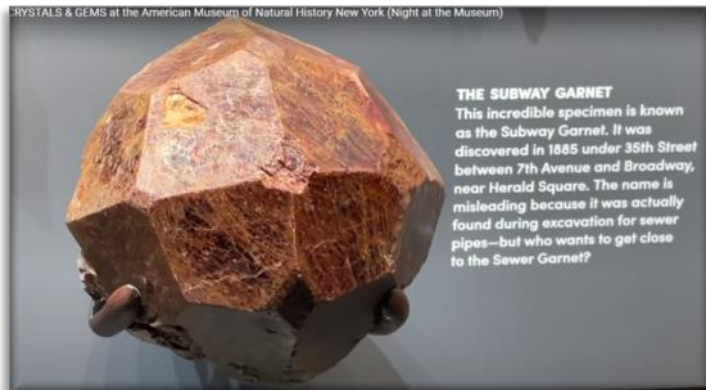


Image from *Fabulous CRYSTALS & GEMS at the American Museum of Natural History New York*

The Biggest Gold Nugget Ever Found; the "Welcome Stranger"

The main Australia gold rush occurred in the states of New South Wales and Victoria from 1851 onwards. It was in the Australian state of Victoria that the largest known gold nugget was found. The lucky prospectors who discovered it were John Deason and Richard Oates, who found it just three centimeters deep at the foot of a tree near the town of Moliagul. It was so big that at the time of the find there were no scales in that area capable of measuring its weight,



Replica of the 'Welcome Stranger'

so they took it to a blacksmith who broke it into three pieces. Its total weight was about 250 pounds and named "Welcome Stranger". They quickly took it to a bank in Dunolly, which advanced them the not inconsiderable amount of \$11,000 (the final price obtained would be about \$2 million). From the nugget, they managed

to extract almost 160 lbs of molten gold that was converted into ingots, which were transferred to the Bank of England on February 21, 1869. A replica of the nugget was created and can be seen in Melbourne's municipal museum. Deason and Oates ended their lives as farmers, the first in 1915 at age 85, and the second in 1906 at age 79. Obviously the *Welcome Stranger* no longer exists. The largest gold nugget we can see today is the so-called Canaa Nugget, which was found on September 13, 1983 in the Serra Pelada mine in the state of Pará in Brazil. It weighs 135 lbs gross and is estimated to contain 115 lbs of gold. It can be seen at the Museum of the Central Bank of Brazil.

<https://www.labrujulaverde.com/en/2020/05/welcome-stranger-the-largest-gold-nugget-ever-found/>

CVRMS Meeting April 18 – Minutes –

MEETING CALLED TO ORDER: AT 7:18 p.m. by Marv Houg, President.

GUESTS OR NEW MEMBERS present included Ralph Waterman and Deanne Peterson. Welcome!

MINUTES OF LAST MEETING; Kim Kleckner made a motion to approve as written. 2nd by Julie. Minutes approved as published.

TREASURER'S REPORT by Dale Stout. Checking account balance \$25,133.14. Scholarships not paid yet. Motion to approve by Ray 2nd by Jay Vavra. Motion passed.

PROGRAM: *Adventures in Geophysics at the Iowa Geological Survey* was presented by Jason Vogelgesang, IGS.

FIELD TRIPS: April 30 at 8:30a.m. At Klein Quarry. Call Marv if interested. Remember all must wear hard hats, safety glasses, steel toed shoes, no shorts or sandals. Wear a safety colored shirt or vest. Matt will line up a 4 County Quarry trip in May.

MISCELLANEOUS: Next meeting need volunteers for treats.

2023 ROCK SHOW: Lots of positive feedback from vendors as well as patrons. Marv thanked all of us, including new members, for their tremendous help. **The only complaint** is about the ATM charging \$3.50 for each withdrawal and ran out the 2nd day. Need some work on that. **Motion made by AJ** to have a show next year, 2024, 2nd by Ray Anderson. Motion passed. March 23-24, 2024, are the dates for next show.

2023 ROCK AUCTION: Jay sent out contracts to consignors; all auction slots are essentially full. **Set up** will be on Friday. **Dell will cook** lunch, and we will order evening Pizzas for Friday workers.

OTHER BUSINESS: Name tags needed, but we have lost our name tag contractor. Dave Malm might know a new vendor, and Dale will contact him. **Kim, Ray and Bill** all busy with outreach presentations for kids.

DOOR PRIZE won by Rick Austin.

BLAIRSTOWN ROCK SHOW Saturday 9-4 at Legion Hall.

MOTION TO ADJOURN by AJ and 2nd by Matt; 9:32 meeting adjourned.

Respectfully submitted
Dell James, Secretary



CVRMS Board Meeting April 25 – Minutes –

MEETING CALLED TO ORDER by Marv at his house, 7:10p.m. .

Members present, Kim Kleckner, Marv Houg, Dale Stout, Ray Anderson, Matt Burns, Bill Desmarais, Sharon Sonnleitner, Dell James

MINUTES OF LAST MEETING: . Motion made to approve by Bill; 2nd by Matt. Motion passed.

TREASURER'S REPORT by Dale . Motion to approve by Kim and 2nd by Matt. Treasurer's report approved.

CLUB INSURANCE: We are insured through Midwest Federation, and a discussion evolved around field trips, shows etc. We will not change this arrangement in the near future.

2023 ROCK SHOW: Biggest concern from the public about the show was the crowded condition, particularly on Saturday. Pros and cons of expanding facility discussed. Biggest con is the cost. Consensus was to leave venue as is. **Matt suggested** some way to change up some vendors. Or maybe two tables to rotate. No decision made. **Suggested topic for next show, What's new in Rocks, What's new in dinosaurs - new finds.** (St. Louis has a dinosaur display for rent. Bill will look into it), *Ice age in Iowa, Mammoth and Mastodon Discoveries.* Discussion to be continued.

SCHOLARSHIP AWARDS: Proceeds from our Rock Show for scholarship (totaling \$14,351) were subdivided as instructed in our by laws; University of Iowa- \$6935, Cornell College-\$4458, VAST- \$2958. Motion to accept scholarship figures by Bill, 2nd by Matt. Motion passed

2023 ROCK AUCTION: Wes Greenfield has a personal collection of about 40 Kahota geodes and coconuts uncracked. Marv will handle it. **Jay has** received about half of the contracts from consignors. **AJ has some Lakers** he would like to get into the auction.

FIELD TRIPS: Matt has lined up April 30th for Klein Quarry. 26 Already signed up. He is also working on 4 County Quarry trip. Will know more about it by May.

FACEBOOK: Kim reported that we have 2400 "friends" and had to kick off one "friend" for inappropriate language.

501C3 ENDORCEMENT: nothing new to report.

RAY WILL HANDLE Emily Walsh offer of *Mineralogical Record* volumes from Paul Garvin's collection.

BILLS BIG BUS TRIP is still lined up for September 30, and the sign up sheet will be available at May club meeting. The trip will cost the club about \$2,655 and holds 56 passengers. Our bus deposit is already in from the 2020 trip that was canceled due to the pandemic. U of Wisc. Museum is free. Burpee Museum fees; ages 13 and up is \$12, 4 to 12 are \$10, and below 4 are free. The club will cover a tip for the driver.

minutes continued on page 3

Celestite Crystal

The 2023 Tucson Show included beautiful specimens of celestine which are now trickling out from a remote locality given as Darai Laman, Badghis Province, Afghanistan. Several superb examples of this new Afghan celestine are now being offered on Ghulam Mustafa's Fine Art Minerals website, Mustafa commenting in his distinctive voice that the crystals, reaching 7.3 cm long and 5 cm thick,



are "the deepest color-saturated large fatty crystals I have ever seen." The nearly complete, translucent to transparent, lustrous blue celestine crystals rest lightly in vuggy masses of brownish white limestone with jagged surfaces covered by drusy white calcite crystals. The piece shown here, probably Mustafa's best, is priced at \$1,800. Celestine or celestite is a mineral consisting of strontium sulfate. The mineral is named for its occasional delicate blue color. Celestine and the carbonate mineral strontianite are the principal sources of the element strontium, commonly used in fireworks and in various metal alloys. <https://cdn.mineralogicalrecord.com/wp-content/uploads/2023/04/Toms-Online-Report-66.pdf>

Minutes of April 25 Board Meeting –continued from page 2.

CVRMS AUDIENCE ETIQUETTE: Board members will prepare rules for audience to mute phones and not interrupting guest speakers with questions during the presentation. This will allow more efficient programs.

NEW ROCK SHOW TABLE COVERINGS: discussion of using table cloths rather than wrapping tables with paper at future rock shows. Sharon brought in a sample which unfortunately has four full sides, we need to keep the back side open. The Waterloo show uses less expensive twin sheets. Sharon will find additional samples

SUMMER POTLUCK PICNICS. Bring your own table service. Dale and Marv will reserve shelters. Ellis Park-June 20, Wana-tee Park-July 18, Morgan Creek Park-August 15.

TAKO (take a kid outside) is scheduled for Klein Quarry on May 20, and our club helps out. Matt, Marv, Dale, Dave, Glenn, Ray and Kim will meet at Klein Quarry.

WIRE WRAPPING CLASS; no contact yet. Kim Long had someone in mind to teach a wire wrapping class. We will contact him to pursue the class.

Respectfully submitted
Dell James, Secretary

Spotlight Gemstone: Emeralds

May's Birth Stone



May's birthstone, the emerald, is one of the most regal of all and one which denotes life and love. It is also one of the most valuable (the very highest quality emeralds can be more expensive than diamonds). Emeralds are the deep green variety of the mineral beryl [Be₃Al₂(Si₆O₁₈)], colored by the element chromium. Emeralds are very hard, 7.5-8 on the Mohs scale. The best emeralds are found in South America, having been cherished by the Inca and Aztec peoples, who regarded emerald as a holy gemstone. In contrast, "Cleopatra's Mines" in Egypt had already been exhausted by the ancient Egyptians, so that when they were rediscovered in the 19th century, there was simply nothing left! These are only a few of the cultures which treasured this gemstone. In Roman times, emerald was associated with Venus, goddess of beauty and love. Its pigment was so venerated that Pliny remarked that green "gladdened the eye without tiring it!" It is also valued in the Catholic Church, green being considered the most elemental and natural of the colors used in their worship. The Vedas, Hinduism's oldest scriptures, acknowledge the healing powers of emeralds, promoting well-being as well as good fortune. Emeralds are also highly prized in Islam - green was the Prophet Muhammed's favorite color, and all dwellers of paradise are said to be dressed in green. In the 1960s, the



The world's largest uncut emerald

American jewelry industry changed the definition of "emerald" to include the green vanadium-bearing beryl as emerald. As a result, *vanadium emeralds*, purchased as emeralds in the United States, are not recognized as such in the UK and Europe. In America, the distinction between traditional emeralds and the new vanadium kind is often referred to as "Colombian Emerald."

What in the World?



What in the World is this strange feature and where is it located??

April's Photo



Last month's **What in the World** photo shows layers of "robust and healthy" Millerite (nickel sulfide) crystals from the Thompson Mine in Manitoba ("unlike the feeble and wispy Millerite specimens from the U.S." including Iowa).

ROCK CALENDAR CVRMS EVENTS OF INTEREST

2023

May 16 — CVRMS Monthly Meeting

Hiawatha Community Center 7:15 pm
Program to be announced

May 26-27 — Sac & Fox Club Show

McMillan Park Grandstand, 405 E Thresher Rd
Mt. Pleasant, IA (8-6 Sat, 8-3 Sun)

June 20 — CVRMS Potluck Picnic

Ellis Park Overlook Shelter 6:30 pm
Rock Polishing

July 21 — CVRMS Potluck Picnic

Wanatee Park Meadowlark Shelter 6:30 pm
Geode Cracking

Aug. 15 — CVRMS Potluck Picnic

Morgan Creek Park Shelter 6:30 pm
Rock Bingo

Sept. 9 -10 — CVRMS Rock Auction

Amana RV Park and Event Center
Amana, Iowa

Sept. 19 — CVRMS Monthly Meeting

Hiawatha Community Center 7:15 pm
Program to be announced

Sept. 22-24 — Geode Fest

First Christian Church Parking Lot
3476 Main Street
Keokuk, IA

Oct. 17 — CVRMS Monthly Meeting

Hiawatha Community Center 7:15 pm
Program to be announced

Nov. 21 — CVRMS Monthly Meeting

Hiawatha Community Center 7:15 pm
Program to be announced

Dec. 5 — CVRMS Holiday Party

Hiawatha Community Center 6:30 pm
Details to be announced

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.

I came across this article about a new survey of seamounts (sea floor volcanoes) that was recently completed using satellite radar to detect minor, localized bulges in sea level. These bulges are created by slightly elevated gravity over the seamounts.

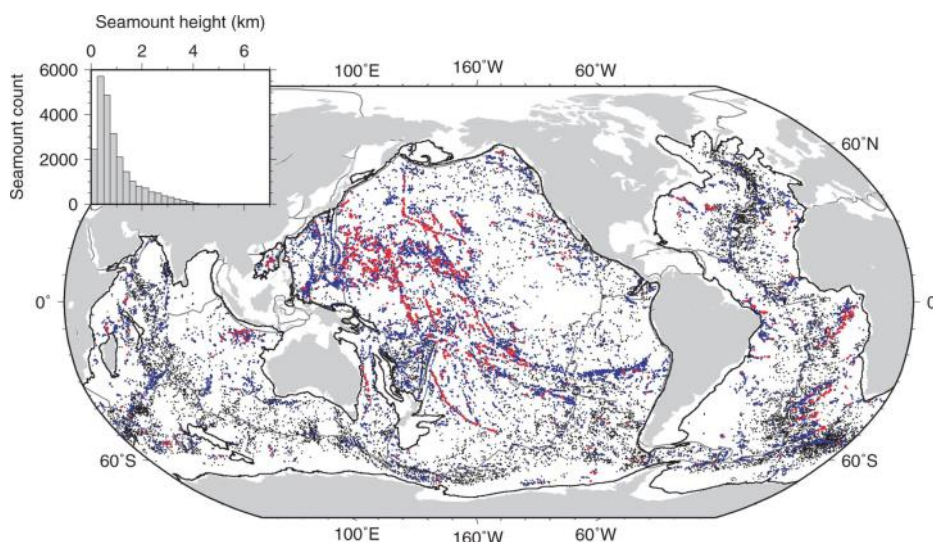
'Mind boggling' array of 19,000 undersea volcanoes discovered with high-resolution radar satellites

High-definition radar satellites have revealed more than 19,000 previously unknown undersea volcanoes around our planet, providing scientists with the most comprehensive catalog of seamounts ever created. The new compendium, which was published April 6 in the journal *Science* could provide a better understanding of ocean currents, plate tectonics and climate change. Prior to this, only one-quarter of Earth's seafloor had been mapped using sonar, which uses sound waves to detect objects hidden underwater. A 2011 sonar census found more than 24,000 seamounts, or undersea mountains formed by volcanic activity. However, there are more than 27,000 seamounts that remain uncharted by sonar, according to the *Science* article. "It's just mind boggling," David Sandwell, a marine geophysicist at the Scripps Institution of Oceanography who worked on the survey. However, the new study shows that scientists don't need to rely on sonar surveys to investigate what's going on under the ocean. Radar satellites not only measure the ocean's height but can also see what's lurking in the water's inky depths, offering a better representation of the topography of the seafloor. Scientists pulled data from several satellites, including the European Space Agency's CryoSat-2, and found that they could detect underwater mounds as small as 3,609 feet tall, which is the lower limit of what constitutes a seamount, according to the *Science* article. With this technology, scientists predict they can estimate the heights of small undersea volcanoes to an accuracy of approximately 1,214 feet, according to the study. So far, researchers have mapped a collection of seamounts in the northeast Atlantic Ocean that could help explain the evolution of a mantle plume that feeds more than 100 volcanoes in Iceland. These updated maps will also provide a better understanding of ocean currents and "upwellings," which occur when water from the bottom of the ocean churns upward to the surface, a phenomenon that scientists think could be "concentrated at seamounts and ridges," according to the *Science* article. "There's a zoo of interesting things that happen when you have topography," Brian Arbic, a physical oceanographer at the University of Michigan in Ann Arbor.

You can read the full [Science article here](#).

<https://www.livescience.com/planet-earth/rivers-oceans/mind-boggling-array-of-19000-undersea-volcanoes-discovered-with-high-resolution-radar-satellites>

Global distribution of 24,643 potential seamounts identified by this study.

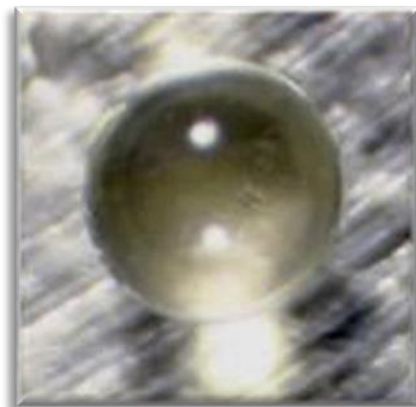


Black dots for $0.1 \leq h < 1$ km ($n = 16,185$), **blue dots** for $1 \leq h < 3$ km ($n = 7514$), and **red dots** for $h \geq 3$ km ($n = 944$). The plate boundaries (Bird 2003) are shown as **grey lines** and the Seamount Exclusion Zones (SEZs) defined by the 2000 m isobaths are drawn as **black lines**. Inset shows histogram of height distribution of potential seamounts.

<https://academic.oup.com/gji/article/186/2/615/588187>

China Discovers Strange Glass Beads on Moon that May Contain Billions of Tons of Water

Chinese researchers may have discovered billions of tons of water inside strange glass spheres buried on the moon, and they could be used as a future water source for moon bases, a new study suggests. The tiny glass spherules, collected in lunar soil samples and brought to Earth by China's Chang'e-5 mission in December 2020, could be so abundant that they store up to 330 billion tons of water across the moon's surface, the new analysis, published March 28 in the journal *Nature Geoscience* shows. The glass spherules, also known as impact glasses or microtektites, form when meteorites smash into the moon at tens to hundreds of thousands of miles per hour, blasting chunks of lunar crust above the moon's surface. Inside these plumes, silicate minerals heated to molten temperatures by the force of the impact combine to form tiny glass beads that are sprinkled like crumbs over the surrounding landscape. The moon's soil contains oxygen, which means that the beads do too. When struck with ionized hydrogen atoms (protons) from



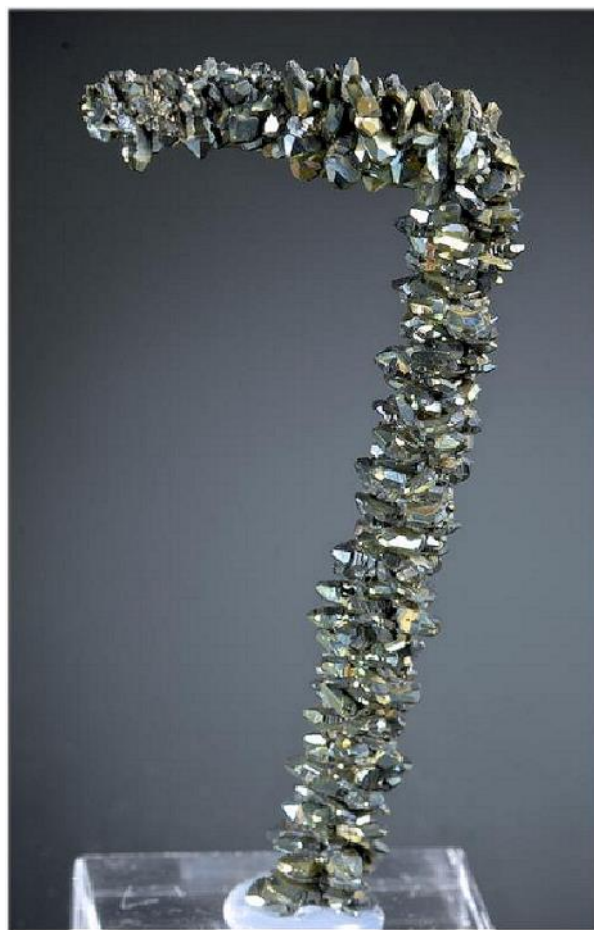
Spherules from an 800,000-year-old meteor impact found in the Transantarctic Mountains. Similar beads on the moon may contain billions of tons of buried water, new research suggests

over time, the researchers said. This could make these spheres an ideal source of water, as well as hydrogen and oxygen, for space agencies like NASA and the China National Space Administration (CNSA) that want to build bases on the moon. The CNSA expects its moon base project to be completed as soon as 2029. "If we want to extract the water in impact glass beads for future lunar exploration, first we collect them, then boil them in an oven and cool the released water vapor. Finally, you will get some liquid water in a bottle," study co-author Sen Hu, a planetary geologist at the Chinese Academy of Sciences' Institute of Geology and Geophysics said. "Another benefit is that impact glass beads are [common] in lunar soils, from equator to polar and from east to west, globally and evenly." China's Chang'e 5 mission landed on the moon to scoop material from its surface before returning to Earth in December 2020.

<https://www.livescience.com/china-discovers-strange-glass-beads-on-moon-that-may-contain-billions-of-tons-of-water>

Marcasite Snakes

There are many alluring things to be seen on the "Spring Updates...classics and new finds" mineralogical adventure tour on Kevin Downey's *Well-Arranged Molecules* website (<https://www.wellarrangedmolecules.com/>). One of the most interesting examples are the marcasite "snakes" from the Linwood mine, Buffalo, Scott County, Iowa. The mineral marcasite, sometimes called "white iron pyrite", is iron sulfide (FeS_2) with orthorhombic crystal structure. It is physically and crystallographically distinct from pyrite, which is iron sulfide with cubic crystal structure. A couple of Midwestern U.S. dealers debuted Linwood marcasite "snakes" at the 2022 Tucson Gem and Mineral Show and brought still more to the 2023 show. Kevin's single example is near the top of the quality range among those displayed at the show, being a sinuous structure of sharp, vaguely snake-scaly marcasite crystals, and brilliantly lustrous besides. It measures 2.5 inches, and is priced at \$420. <https://cdn.mineralogicalrecord.com/wp-content/uploads/2023/04/Toms-Online-Report-66.pdf>



Marcasite 'snake' from the Linwood Mine, Buffalo, Iowa.

70-Year-Old Mystery Over Bizarre 'Tully Monster' May Finally Have Been Solved

Since its discovery nearly 70 years ago, the true nature of *Tullimonstrum gregarium* – AKA the Tully monster – has confounded scientists. Studies have variously found it was a vertebrate, or an invertebrate, with a back-and-forth that has gone on for years. "We believe that the mystery of it being an invertebrate or vertebrate has been solved," says paleontologist Tomoyuki Mikami, at the University of Tokyo at the time of the study, now at the National Museum of Nature and Science in Japan. "Based on multiple lines of evidence, the vertebrate hypothesis of the Tully monster is untenable. The most important point is that the Tully monster had segmentation in its head region that extended from its body. This characteristic is not known in any vertebrate lineage, suggesting a nonvertebrate affinity." Numerous specimens of fossil-



An artist's impression of the Tully monster.

ized Tully monsters have been found since fossil hunter Francis Tully stumbled across the first in the Mazon Creek fossil bed in Illinois in 1955, and they paint a picture of a truly bizarre marine beastie. Measuring up to 6 inches in length, the Tully monster had a body with cuttlefish-like fins on its tail, eyes protruding from stalks like a bar across its forehead, and a long, thin proboscis ending in what appears to be a toothed mouth or claw. The sheer weirdness of the thing has made it incredibly hard to classify even at the basic level. No bony structures have been found in any of the fossils, but that's not diagnostic in and of itself. Cartilaginous skeletons, as found in some vertebrate fish, would not be preserved in the same way as bone. Some of the Tully monster's characteristics have been interpreted as consistent with structures found in jawless cartilaginous marine vertebrates, such as lampreys. Other scientists have argued that these characteristics cannot be conclusively interpreted as vertebrate-like. It's a debate that has gone back and forth for years. To try to resolve the issue once and for all, Mikami and his colleagues undertook an exhaustive investigation. They collected more than 150 Tully monster specimens and more than 70 fossils of other creatures from the exceptionally detailed Mazon Creek fossil bed, and subjected them to high-resolution 3D laser scanning and x-ray micro-computed tomography. They made a careful study of structures that had been interpreted as analogous to vertebrate characteristics. These were features that had been interpreted as myomeres, or blocks of skeletal muscle tissue; a tri-lobed brain; cartilage; and fin rays. None of them, the researchers found, were comparable to features found in vertebrates. What had been interpreted as myomeres was clearly different from structures found in vertebrates, and the vertebrate-like brain, gill pouches, cartilages and fin rays were absent entirely. Moreover, the "teeth" in the proboscis were very different from those of lampreys, contrary to previous comparisons. Since the Tully monster is so unlike any creature living on Earth today, it's unsurprising that scientists have struggled to figure out where it fits. Having found that it's an invertebrate, the next challenge for the team is to figure out what kind of invertebrate it was: a vertebrate-like invertebrate, such as a lancelet? Or is it closer to worms and snails? Two things are crystal clear: the Tully monster has not even come close to giving up all its secrets. And neither is our planet Earth: how many oddities like the Tully monster have been lost to the ravages of time? "There were many interesting animals that were never preserved as fossils," Mikami says. "In this sense, research on the fossils from Mazon Creek is important because it provides paleontological evidence that cannot be obtained from other sites. More and more research is needed to extract important clues from Mazon Creek fossils to understand the evolutionary history of life." <https://www.sciencealert.com/70-year-old-mystery-over-bizarre-tully-monster-may-finally-have-been-solved>

Lightning Bolt Deposits a Strange Mineral Never Seen on Earth Before

A lightning bolt that struck a tree on Florida's west coast has produced a fascinating type of phosphorus material we haven't seen on Earth before: one that could represent a whole new mineral group, bridging the gap between space minerals and minerals found on Earth. The



The fulgurite recovered for the study.

material, which is a **close match for calcium phosphite (CaHPO₃)**, was found trapped inside a fulgurite, a "metal glob" formed by the reaction of the ultra-hot lightning bolt with the sand around the roots of its target. These 'fossilized lightning' fulgurites often occur when lightning strikes certain types of sand, silica, and rock. What's much less common is to find something so unique hidden inside one of these structures. "We have never seen this material occur naturally on Earth, minerals similar to it can be found in meteorites and space, but we've never seen this exact material anywhere," says geoscientist Matthew Pasek, from the University of South Florida. The lightning strike combusted carbon in the tree it hit, as well as the iron that had built up around its roots, the researchers determined. This form of calcium phosphite could well form in other high-energy scenarios, and may play a significant role in the phosphorus cycle (the movement of this chemical element around Earth). Attempts to remake this CaHPO₃ in the lab were unsuccessful, showing that very specific conditions and timings are required to produce the rarely seen mineral. As well as affecting the phosphorus cycle today, the findings may also have relevance in terms of the earliest periods in the history of our planet. These sorts of lightning strikes and chemical reactions were likely to have been happening regularly, but the cycle of phosphites is not something scientists fully understand. "Previous researchers indicate that lightning reduction of phosphate to have been a widespread phenomenon on the early Earth," researchers say. "However, there is an environmental phosphite reservoir issue in Earth that these solid phosphite materials are hard to restore." That "issue" means that we can't fully explain certain phosphite-driven biological and chemical processes that we know are happening, but which should rely on stores of phosphite that are yet to be discovered. The appearance of this brand new phosphorus material can also teach scientists more about how phosphorus is reduced, that is, transformed into other states via chemical reactions via the gaining of electrons, at different temperature levels. At the same time, the research provides more information about the form and power of lightning itself. This is far from the first time that this spectacular phenomena has produced materials of special interest to scientists. "It's important to understand how much energy lightning has because then we know how much damage a lightning strike can cause on average and how dangerous it is," said Pasek. "Florida is the lightning capital of the world and lightning safety is important; if lightning is strong enough to melt rock, it can certainly melt people too." <https://www.sciencealert.com/lightning-bolt-deposits-a-strange-mineral-never-seen-on-earth-before>

How High Can a Mountain on Earth Grow?

Sixty million years ago, when the Eurasian plate slammed into the Indian plate, a mountain range was born. Because these plates were of similar density, neither could sink below the other. The rocks had nowhere to go but up. Now, the Himalayas host Earth's tallest mountains. Mount Everest is the tallest, towering 5.4 miles above sea level. After Everest, the next tallest is K2, which rises 5.3 miles above Earth's surface. Could these mountains be any higher? For that matter, how high could any mountain grow on Earth? Theoretically, a mountain could be quite a bit taller than Everest. But first it would have to overcome a few challenges that many mountains face as they grow. For instance, because of Earth's gravitational pull, any pile of rock that grows into a mountain will start to slouch, much like a wad of bread dough will slowly flatten when placed on a table. Active processes, like erosion, also help keep mountains from growing too tall. Glaciers, vast blocks of slowly moving ice, are especially good at carving up mountains. Earth scientists refer to glacial erosion as the *glacial buzzsaw* because they are so effective at taking the sides off of mountains. Glacial erosion creates a steep-sided mountain that is then prone to landslides. The effects of erosion and gravity mean that the bigger the mountain, the greater the stresses created by gravity and the stronger the tendency to collapse. And although Mount Everest could conceivably get elevated yet higher, its steep south side seems unstable. However, there are ways a mountain could grow taller than Everest, possibly even 1 mile taller, but only if the conditions were just right. First, it'd have to be formed from volcanic processes rather than from continental collision. Volcanic mountains, like the Hawaiian Islands, grow as they erupt. Lava flowing out of the volcanoes cools in layers, building the volcanoes higher and higher. And finally, for the mountain to keep growing, it would need a continuing source of magma pumped higher and higher, allowing it to erupt, flow down the mountain's sides, and cool. This volcanic process is exactly how the solar system's tallest mountain, Mars' Olympus Mons, formed. Towering 16 miles, Olympus Mons is so tall that it actually pokes through the top of the Red Planet's atmosphere. Olympus Mons could get so tall because Mars lacks plate tectonics. Olympus Mons formed over a hotspot, a deep well of rising magma that repeatedly erupted. However, even though the Hawaiian Islands also formed over a hotspot, the Pacific plate keeps moving, so the islands won't stay over the hotspot long enough for their volcanoes to become as large as a mountain like Olympus Mons. But even giants like Olympus Mons have a limit. This is because the pressure required to continue to pump magma to the top of the mountain might soon be unable to overcome the forces working against it — the height of the mountain and Mars' own gravitational pull. <https://www.livescience.com/whats-the-highest-a-mountain-can-grow-on-earth>



If you were to meet a velociraptor, you wouldn't be confronted with the tall, sleek and lizard-skinned beast from the hit *Jurassic Park* franchise. Instead, you would likely face off **against a much smaller, feathery and colorful creature**. Over the last few decades, scientists have learned a lot about what dinosaurs looked like — and that's changing long-held beliefs.



Depiction of a feathered velociraptor

Did Dinosaurs Have Feathers?

One of the biggest recent changes, said Paul Barrett, a researcher with the Natural History Museum in London, concerns the feathery coat of species such as the velociraptor. *"We now know from lots of fossils, in particular from China, that the relatives of velociraptor, and by extension velociraptor itself, was coated with feathers,"* Barrett said. *"They had very long, bird-like feathers on their forearms and downy feathers covering most of the rest of the body."* The variety of plumage these meat-eaters sported was large. **Caudipteryx**, a diminutive theropod from the Early Cretaceous, had a tail fan full of feathers. Meanwhile, researchers believe that the **Caihong**, from the Jurassic period, likely had shiny, iridescent feathers, possibly not too dissimilar from what we might see today on a hummingbird, said Sarah Davis, a postdoctoral researcher at the University of Texas.

Colored Dinosaurs

Thanks to some well-preserved fossil finds and new research techniques, it's also known that dinosaurs had all sorts of fleshy appendages. These came in a variety of colors. In some cases, alongside fossilized feathers, archaeologists have also found fossilized melanosome structures, Davis said. *"Those are pigments that make browns and greys and blacks,"* she explained, citing the example of **Anchiornis**, which was a mostly black dinosaur from the Jurassic. *"This little, tiny, bird-like raptor dinosaur essentially had wings. It had these fluffy tail feathers on its back legs, as well as a long tail that could fan out,"* Davis said. It also had white stripes running along its wings, she continued, and a brown head crest that was likely used as a display or in communication with others of its kind. The Cretaceous period's **Psittacosaurus**, as another example, had broom-like bristles on its tail and a range of markings on its body; in 2016, these findings allowed researchers to reconstruct the species in exquisite detail.

Crested Dinosaurs

As exciting as it is to get a clearer glimpse of what dinosaurs actually looked like, however, researchers are more interested in what this tells them about possible dinosaur behavior. *"For most of the 20th century, dinosaurs were viewed as fairly boring, kind of sluggish animals, not very intelligent and not indulging in many behaviors,"* he said. *"We now know that dinosaurs behaved in lots of bird like ways; they brooded their nests like birds, [and] they probably displayed a bit using their feathers like birds."* One fossil from Canada revealed that **Edmontosaurus**, a "big, chunky, quadrupedal animal," according to Barrett, was equipped with a fleshy crest on top of its head, likened to that of a rooster. It's thought that the headgear from this crested dinosaur was likely used as a "sexual display structure," say the researchers who made the discovery.

Dino-vision

In a relatively short time period, our knowledge of what many dinosaurs looked like has expanded greatly. And Barrett and Davis both agreed that these findings are opening the door to many other fascinating questions. *"I'm really interested in how dinosaurs could actually perceive color,"* Davis said. *"We know that birds in particular are able to see a wider array of colors than a lot of animals and that impacts the way they might be using colors for display."* Whether these feathery displays and skin pigmentations lent themselves to a species-specific dino-vision is a question she hopes to tackle one day. *"Are we kind of getting the superficial level of what dinosaurs looked like? And did they actually look completely different to each other?"* Davis continued. *While new discoveries often depend on finding a lucky, spectacularly preserved fossil specimen or on the development of new tech, Barrett believes more detailed knowledge of what dinosaurs looked like is on the horizon. "Just in the length of my career, I've seen some really big changes that I think my predecessors wouldn't have thought were ever going to happen,"* he said. *"The pace of that change is increasing."* <https://www.discovermagazine.com/planet-earth/heres-what-dinosaurs-really-looked-like>



Cedar Valley Rocks & Minerals Society will hold its **2023 consignment Auction on September 9-10** in the Morton Building at the Amana RV Park, Amana, IA. The auction assists collectors or families of collectors to dispose of their collections. Knowledgeable club members act as auctioneers. Auctions typically attract about 100 bidders and about 1300 lots will be auctioned.

Viewing is Friday night Sept. 8 from 5:00 - 7:30 pm , Saturday morning Sept. 9 from 7:30 - 9:00 am. and Sunday morning Sept. 10 from 8:00 - 9:00 am. The Saturday Auction runs from 9:00 a.m. to about 8:00 pm, with hot food available during the day and a dinner offered from 5:30 - 6:00 pm. The Sunday Auction runs from 9:00 am to about 3:30 pm, again with hot food available.

Cash, credit card (with small service fee) or good check is accepted for payment. Iowa sales tax of 7% is also added to all items. Bidders who provide Iowa tax permits are exempt from paying it.

If you can't stay for those special lots you want, you can leave a maximum bid, and a club member will bid for you up to your maximum.

Motel rooms are available in Amana, but they are sometimes sold out. Motels are also available in Little Amana (15 minutes away), Cedar Rapids & Iowa City (each about 25 minutes away).

Since each sale has several consigners, the sale rotates among the consigners. All lots are numbered, and an order of sale is available at viewing on Saturday morning. **Equipment sales begin at 2:00 pm on Saturday.**

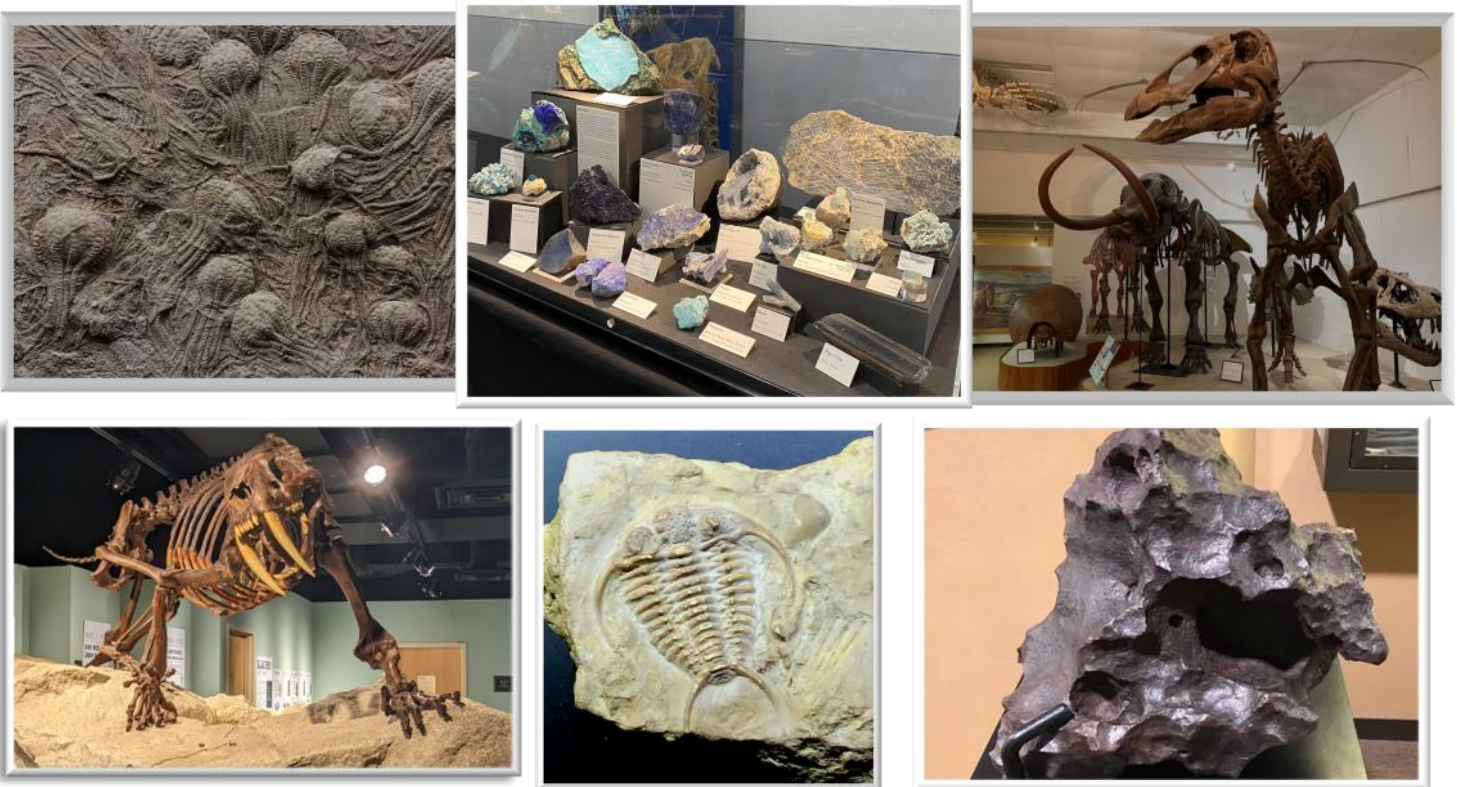
If you have a collection to dispose of, please contact [Marv Houg](#) or [Sharon Sonnleitner](#) (*see contact information on page 12*). The club does all the advertising and sets up the Friday before the auction. A 25% commission is charged for non-members, and 20% is charged for members or families of members who have belonged to the club for at least 2 years.



"Bill's Big Bus Boogie" 2023

U. of Wisc. Geology Museum & Burpee Museum of Natural History

The 2023 edition of "Bill's Big Bus Boogie" adventure is on again after a 3-year COVID break. This year's trip will take CVMRS members on a bus field trip to the **University of Wisconsin Geology Museum** in Madison, Wisconsin, and the **Burpee Museum of Natural History** in Rockford, Illinois, on **Saturday, September 30, 2023**.



The sign-up sheet for members interested in participating in the trip will be available at our May club meeting. For additional information phone **Bill Desmarais** at **319-365-0612** or desmarais_3@msn.com. Departure and arrival times and details of the trip will follow in future club meetings, newsletters, and on the club website.

It will be another great and memorable "Bill's Big Bus Boogie" field trip!

2023 Bills Big Bus Boogie
will leave from Cedar Valley World Travel
6100 7th St SW, Cedar Rapids
Sat. Sept. 30 - **6:00 a.m. SHARP** and return ~ **6:00 p.m.**
monitored parking available

additional information will appear in future newsletters.

2022 & 2023 Officers, Directors, and Committee Chairs

President	Marv Houg (m_houg@yahoo.com).....	(319)364-2868
Vice President. ...	Ray Anderson (rockdoc.anderson@gmail.com)	530-2419
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)	310-0085
Director '23	Jay Vavra (vavraj@gmail.com).....	538-3689
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Director '25.....	Matt Burns (mlburnsmars@gmail.com)	329-4046
Sunshine.....	Dolores Slade (doloresdslade@aol.com)	351-5559
Hospitality	Karen Desmarais (desmarais_3@msn.com)	365-0612
Webmaster.....	Sharon Sonnleitner (sonnb@aol.com)	310-0085

Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:15 p.m. Meetings are held at 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

**Next Meeting:
MAY 16
Hiawatha Community Center
"Select YouTube Videos for
Information and Entertainment"
by Ray Anderson
Cedar Valley Rocks and Minerals Society**



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