

# Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

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

CEDAR VALLEY GEMS

NOVEMBER 2018

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## Next CVRMS Meeting Tues. Nov. 20

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

**ANNUAL MEETING—ELECTION**  
(see page 3)

featured speaker:

**Phil Kerr**

Iowa Geological Survey

## Iowa's Ice Age History - a Look at the Frigid Past

Iowa sits at the end of the line for North American glaciers. Because of this, ice has eroded, deposited, and shaped the state's landscape. Even the state's outline is the product of glaciation. Besides modifying the landscape, materials left behind by the glaciers help us understand the history and development of the Earth's past and present climate. Since Iowa's glacial tills record numerous major ice advances, it holds many clues to North America's glacial past. Come learn how ice has wrought and carved the State, and some of the secrets that it left behind!



Photo from Klein Quarry showing two Pre-Illinoian tills capped with reddish-brown loess

## Dynamoterror the "Powerful Terror Ruler"

Tyrannosaurs often bear fierce names, like "**tyrant lizard**" (*Tyrannosaurus* itself), the "**monstrous murderer**" (*Teratophoneus*), the "**frightful lizard**" (*Daspletosaurus*), and the "**gore king**" (*Lythronax*). But a new set of tyrannosaur bones extracted from the 80-million-year-old rock of New Mexico may have one of the most imposing names of all—**Dynamoterror dynastes**, the "**powerful terror ruler**."



The remains of *Dynamoterror* were found in New Mexico's Menefee Formation in 2012. Dinosaurs are hard to find in this part of the San Juan Basin, making almost any find worth noting, but initial clues indicated that this find was something special. Time had not been kind to the remains of *Dynamoterror*,

breaking and scattering the bones. It took years of puzzling together the recovered shards before the critical fragments—a pair of telltale skull bones called frontals—were pieced together, revealing the fossil's identity as a previously-unknown tyrannosaur. Although the fossil is scrappy, it still adds context to the broader picture of the roughly 25 distinct tyrannosaurs known so far. Not only is *Dynamoterror* new, but it falls in a specific tyrannosaur subgroup that contains some of the last and largest of the species, like *T. rex* itself. *T. rex* lived between 68 and 66 million years ago, its famous relatives *Gorgosaurus* and *Albertosaurus* about 75 million years ago, but *Dynamoterror* and its relative *Lythronax* about 80 million years ago. *Dynamoterror* would have been about 30 feet long, far larger than the earliest tyrannosaurs (though not quite as big as *T. rex*), making it the top predator in its ancient realm. *Dynamoterror* differs from other known tyrannosaurs of a similar age indicating that there were distinct evolutionary pockets along the length of the ancient subcontinent. It could very well be that there were other unusual tyrant lizards now entombed in the rocks, waiting to be uncovered and help fill in the picture of how these tyrants came to rule Laramidia (the island that was western North America during the late Cretaceous). [https://www.smithsonianmag.com/science-nature/newly-discovered-tyrant-dinosaur-stalked-ancient-new-mexico-180970491/?utm\\_source=twitter.com&utm\\_medium=socialmedia&fbclid=IwAR3d7J4eb1q2F00guRflHujDg\\_RNy7GGQY\\_I7qqB0nlC0oQKbqR0xbuDb5A](https://www.smithsonianmag.com/science-nature/newly-discovered-tyrant-dinosaur-stalked-ancient-new-mexico-180970491/?utm_source=twitter.com&utm_medium=socialmedia&fbclid=IwAR3d7J4eb1q2F00guRflHujDg_RNy7GGQY_I7qqB0nlC0oQKbqR0xbuDb5A)

## CVRMS Oct 16 Meeting

Hiawatha Community Center

**7:15pm. The monthly meeting was called to order** by Marv Houg President. Introduction of new members or guests  
Welcome to Conner Fasie-Shaw (sp).

**Treasurer's report**-Dale Stout checking account balance \$9863.82. A review of account with final balances given. Motion to approve by Bill second by Tom. Report approved.

**Program** presented by University of Iowa students with Professor Jeff Dorale. Mitch Carver, Brittany Stolfue, Matt Trombath. Reported on summer field camps that the club's scholarship money helps to support.

**Door prize**-won by Brittany Stolfue, a student presenter. Congratulations.

**Auction recap**-a list of items that auctioned for more than \$100 was reviewed with questions. Marv reviewed how to get items into auction for anyone interested.

1. Notify Marv by whatever means.
2. Estates get preference since that was how the auction was started.
3. Have a list of possible items for sale.
4. Charge is 25% of sale price for non members and 20% for members.
5. Bottom line-talk to Marv

**Bill's Big Bus Boogie to Milwaukee** on Nov.4 is full. Contact Bill for further questions, etc. Leave at 6:30 a.m. from Cedar Valley World Tours Building 7th. St. Ct. S.W. Cedar Rapids. Will make pickup stop about 7:00 at Anamosa in Walmart Parking lot. One stop in Platteville for break and McDonalds.

**Correspondence**—Des Moines show 10/20 and 21 and Quad Cities next weekend.

**Other Business**—November's Meeting is our annual meeting. Marv will select a nominating committee.

**Motion to adjourn** by AJ; second by Tom. Meeting adjourned at 8:55pm.

Respectfully submitted, *Dell James, Sec*

## CVRMS Board Minutes Oct 30

Called at 7:10

at the home of Marv Houg

**Present:** -Dale Stout, Marv Houg, Ray Anderson, Bill Desmarais, Sharon Sonleitner, Dell James, Rick Austin; called to order by Marv Houg, President

**Bill Reported that the bus trip** is essentially full. Daylight savings time goes into effect that day as a reminder to everyone. Leave at 6:30 am from bus headquarters. One pickup stop in Anamosa at about 7:00 am and a rest stop in Platteville for break and McDonalds. Dale will send an email with details.

**Auction**—Sharon, Jay and Marv reviewed potential participants in Auction 2019 with number of lots. Jay had emailed potential participants and gave report of responses. It appears that the auction with some adjustments is full. Already working on 2020 auction.

**March 2019 show**—Ray and Sharon have website setup up and functioning. Already received a registration. A general discussion regarding items needed. Potential contributors to "gift" bags such as coupons etc. All suggestions accepted. Also, centerpieces for banquet tables.

**Display Cases**—Sharon has design for collapsible case. Dave Malm is reviewing, too. We may need to borrow Waterloo Club's cases, too. Our cases are on the show website.

**Rick and Sharon still working on table favors design.** Contracts for dealers should go out soon. Marv will contact Bob Roper.

**Next month's meeting is the Annual Meeting.** Marv selected Sharon, Ray and Jay for the nominating committee. One board position is open for election. The committee put forth reelection of Bill Desmarais.

**Christmas donations** - The hat will be passed at Christmas party per usual. Anyone else willing to contribute may contact Dale or Marv and make arrangements. This year the club will donate to HACAP and Linn County Food Bank.

**Sharon reviewed the rules regarding submission** for various awards that are available. The newsletter, the website, individual bulletin by Ray do not qualify for various reasons. Therefore, no submissions from us.

**Motion to adjourn** by Jay; second by Rick. 9:45 adjourned.

Respectfully submitted, *Dell James, Sec. .*





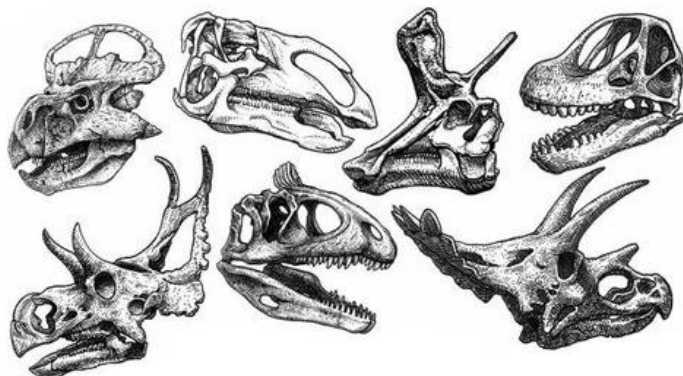
# CVRMS

## ELECTION OF CVRMS 2019 OFFICERS AT NOVEMBER ANNUAL MEETING

The November 20 CVRMS meeting is our official **Annual Meeting**, which means it is time for members to elect club officers. Terms for all officers except Directors are for two years. Directors are elected for staggered three years. This is an off-year for full election, but Bill Desmarais' term as **Director** expires in December; however, \*the Nominating Committee recommended that Bill be elected to a second 3-year term. Current officers are:

<b>President</b>	Marv Houg
<b>Vice President</b>	Ray Anderson
<b>Treasurer</b>	Dale Stout
<b>Secretary</b>	Dell James
<b>Editor</b>	Ray Anderson
<b>Liaison</b>	Bob Roper
<b>Director '18</b>	Bill Desmarais*
<b>Director '19</b>	Rick Austin
<b>Director '20</b>	Jay Vavra
<b>Webmaster</b>	Sharon Sonnleitner

Anyone interested in serving as Director may enter their name at the November 20 meeting, and club members present will vote.



## Spotlight Gemstones: Citrine / Topaz

### November's Birth Stones



**Citrine** is a member of the large quartz family ( $\text{SiO}_4$ ), which, with its multitude of colors and structures, offers gemstone lovers almost everything their hearts desire in terms of adornment and decoration, from absolutely clear rock crystal to black onyx. The name citrine is derived from its color, the yellow of the lemon (although the most sought-after stones are a clear, radiant yellowish to brownish red). Like all crystal quartzes, the citrine has a hardness of 7 on the Mohs scale and is relatively resistant to scratches. With no cleavage it is also resistant to fracturing. Although citrine's refractive index is relatively low, the yellow stones have a mellow, warm tone that seems to have captured the last glow of autumn. Natural citrines are rare, and most good quality stones are found in Minas Gerais Brazil, Madagascar, and Hasawarka in the Ural mountains of Russia. Most commercial citrines are heat-treated amethyst or smoky quartz.

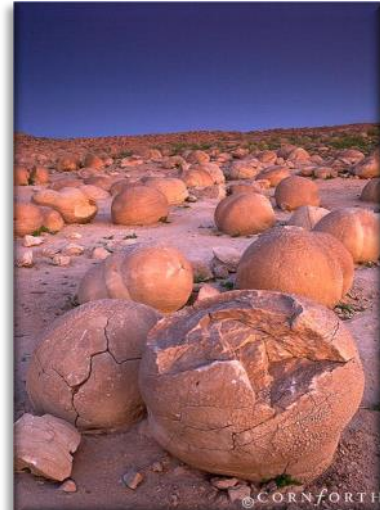
**Topaz** ( $\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$ ) is one of the few gem minerals that contains fluorine. The gem can be found in many varieties; colorless, pink, and shades of yellow to sherry-brown are most common, but blue and green-blue stones can resemble aquamarine, and natural red and pink colors are extremely rare. Sherry colored crystals can be heat-treated before cutting, producing pink topaz, a process called "pinking." Its hardness of 8 makes it very resistant to scratching. **Orange topaz**, also known as **precious topaz**, is the traditional November birthstone (and the state gemstone of Utah), while blue topaz is the birthstone for December. Topaz is commonly associated with silicic igneous rocks (granite and rhyolite.) It typically crystallizes in granitic pegmatites or in vapor cavities in rhyolite lava flows including those at Topaz Mountain in western Utah. The American Golden Topaz is the largest piece of cut yellow topaz in the world. It is sized at 22,892 carats (10 lbs) and has 172-facets (flat-faced cuts applied to gems, in order to help them reflect light.) The gem was cut from a piece of yellow topaz that was 26 lbs in size, discovered in the Minas Gerais, Brazil. It was donated to the Smithsonian Institute, and put on display in the National Museum of Natural History in Washington, D.C.

## What in the World?



**What in the World** is this fairy tale landscape, and where in the world is it?? (hint: it's not in Utah but is in the U.S.).

## October's Photo



October's **What in the World?** is a field of concretions called the Pumpkin Patch in Anza Borrego Desert State Park in California east of San Diego. As the sunset turns into purple twilight, the boulders begin to glow orange like pumpkins

## Rock Calendar CVRMS EVENTS OF INTEREST

### 2018

**Nov. 4—CVRMS Fall Field Trip**  
Milwaukee Public Museum  
Milwaukee, Wisconsin  
see p. 11 for details

**Nov. 20 - CVRMS Monthly Meeting**  
Feature Program  
*Phil Kerr*  
*"Pleistocene History of Iowa"*  
Hiawatha Community Center 7:15 pm

**Dec. 11 - CVRMS Monthly Meeting**  
Feature Program  
*"CHRISTMAS PARTY"*  
Hiawatha Community Center 6:30 pm

### 2019

**Jan. 15- 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 me a good question;** "I know that lots of the colored stone jewelry we see is made with manufactured glass. Is there any naturally-occurring glass that is used for jewelry?"

**Rock Doc answered;** "First let's define glass. I like to think of glass as an amorphous material created by melting minerals and quenching the melt before it can crystallize. Earth processes produce many types of glass, most by the rapid cooling of magma which can produce **obsidian** (also called **tachylite**) in a variety of forms and colors. Glass can also be produced by melting along especially energetic fault zones (**pseudotachylite**) or even from sand and silt melted by the heat of lightning strikes (**fulgurite**). My favorite glass is one produced by a meteorite impact. Most larger meteor impacts produce **suevite** (glass formed by the rapid cooling of the melted materials that line the crater shortly after impact) and **pseudotachylite** (glass produced as impact energy slides rock blocks against one another). Very interesting materials, but my favorite impact glasses are **tektites**. Tektites are created by the impact "blasting" vaporized rock out the crater. The vapor cools and condenses then solidifies as it flies through the atmosphere (often assuming aerodynamic shapes and frequently displaying "sculptation"—pits and grooves—on their surface). There are a handful of **tektite** "strewn fields" around the Earth, and most of the tektites found are black and nearly opaque. But there are other types of **tektites**. The Sahara desert in Libya yields a clear to yellowish glass called **Libyan glass** that is interpreted as having been produced by an impact (although most researchers think it was produced by an aerial meteorite burst that melted the surface below—so not technically a **tektite**) Then there is **moldavite**, a yellowish green to greenish brown natural glass found in central Europe, specifically in southern Bohemia, western Moravia, the Lusatia area (Germany), and the Waldviertel region (Austria). Also called **Bouteille stone** or **vtavin**, the glass is thought to have been formed



samples of black glass tektites



specimen of Libyan glass



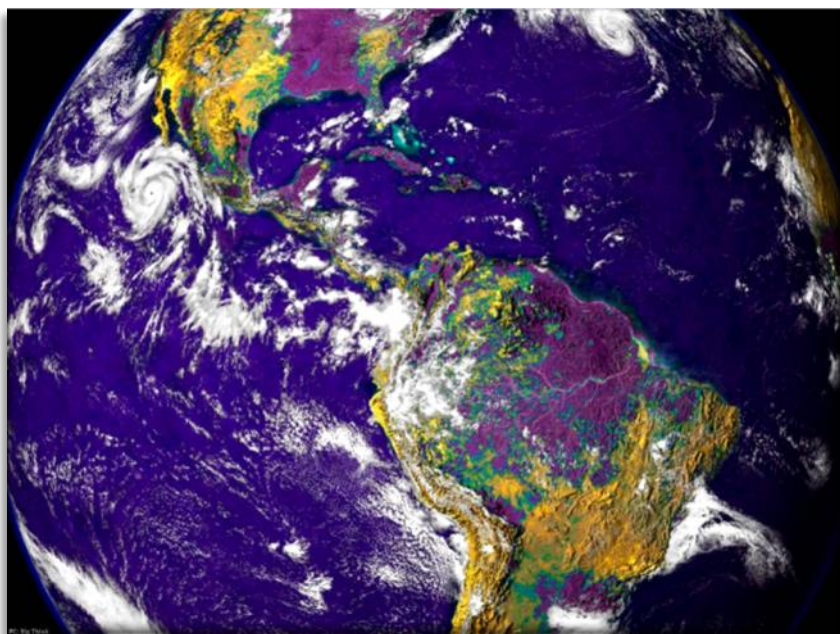
specimens of moldavite as collected (above) and faceted as gemstones (below)



by an asteroid impact about 15 million years ago. Tektites are not found everywhere around an impact crater, but usually only in one general direction from a crater. So current interpretations suggest that the glass is produced not by the meteorite exploding, but prior to the explosion, by air compressed by the rapidly moving meteorite (average speed about 45,000 mph) during an oblique impact. As the air is compressed against the ground, moments before the impact, it vaporizes the surficial materials and blasts them out ahead of the actual impact in a "down-range" direction. The glass condenses and cools to glass before it lands. This implies that the **moldavites** were sourced by the Ries Crater (originally 15 miles in diameter) in Germany. **Moldavite** is relatively transparent and has become valued as a gemstone, frequently faceted. Its primary coloring components are  $\text{Fe}^{\text{II}}$ ,  $\text{Fe}^{\text{III}}$  and perhaps also  $\text{Mn}^{\text{II}}$ . It has been estimated that about a million tons of **moldavite** were produced by the impact of which about 10,000 tons remain today. About 10 to 20 million individual pieces of moldavite (total weight of about 30-60 tons) have been collected to date.

# Was Life on the Early Earth Purple?

A recent article in *Astrobiology Magazine* suggested that early life forms on Earth may have been able to generate metabolic energy from sunlight using a purple-pigmented molecule called retinal, possibly predating the evolution of chlorophyll and photosynthesis. If retinal has evolved on other worlds, it could create a distinctive biosignature as it absorbs green light in the same way that vegetation on Earth absorbs red and blue light. Earth's atmosphere has not always contained significant amounts of oxygen. For the first two billion years of our planet's history, the atmosphere was rich in carbon dioxide and methane, but around 2.4 billion years ago something changed: the Great Oxygenation Event that saw the abundance of free oxygen in our atmosphere dramatically rise. The cause of this is thought to be cyanobacteria, which are able to perform photosynthesis – the transformation of sunlight and carbon dioxide into metabolic energy to produce sugars that fuel life's processes, and oxygen as a 'waste' product, using a green pigment called chlorophyll. Photosynthetic life forms are known to have existed prior to the Great Oxygenation Event (GOE), as far back as 3.5 billion years ago, but various competing, and not completely understood, processes postponed the GOE, including geological mechanisms that were able to remove oxygen from the atmosphere. However, the origin and evolution of photosynthesis via chlorophyll remains murky. Now, a professor of molecular biology at the University of Maryland, and an astrobiologist at the University of California, Riverside, have suggested that retinal predated chlorophyll, and



that the two evolved in tandem, absorbing sunlight at complementary wavelengths. According to the researchers, retinal-based phototrophic metabolisms are still prevalent throughout the world, especially in the oceans, and represent one of the most important bioenergetic processes on Earth. Chlorophyll absorbs light peaking at wavelengths of 465nm and 665nm. This is why plant leaves appear green, because they reflect green light rather than absorb it. However, the Sun's spectrum peaks at ~550nm, which includes yellow and green light. A number of proteins that absorb sunlight contain a molecule of retinal, including one protein called bacteriorhodopsin that absorbs light peaking at 568nm, close to the wavelength at which the Sun's light peaks, and most notably in the range that chlorophyll does not absorb it. The researchers argue that because retinal is the simpler molecule, it would have evolved first, with chlorophyll (which is more efficient at transforming sunlight into metabolic energy) appearing afterwards, each filling

different niches in terms of the light they absorb. They say that this was a very early evolutionary invention coinciding with the evolution of the first cells. Using the energy-trapping capability of the cell membrane, the membrane potential (the difference in electrical potential between inside and outside the cell) allowing the cell to provide energy] may represent one of the most important reasons why cells are the fundamental unit of life. Because vegetation on Earth absorbs red light, but reflects infrared light, viewing vegetation using a spectroscope reveals a dramatic dip in reflected light at red wavelengths, a sudden decrease that is called the "red edge." It has been suggested that when probing the spectrum of light reflected from potentially habitable exoplanets, scientists could search for a red edge in the planet's light, which would be a biosignature indicative of vegetation using chlorophyll, or its extraterrestrial equivalent. Intriguingly, since retinal pigments absorb green and yellow light, and reflect or transmit red and blue light, then retinal-based life would appear purple in color. Because retinal is a simpler molecule than chlorophyll, then it could be more commonly found in life in the Universe, and therefore a "green edge" in a planet's spectrum could potentially be a biosignature for retinal-based life.

<https://phys.org/news/2018-10-life-early-earth-purple.html>

# Titanite - also known as Sphene

Titanite is a rare titanium mineral that occurs as an accessory mineral in granitic and calcium-rich metamorphic rocks. It is a minor ore of titanium and a minor gemstone known as "**sphene**." Titanite's diagnostic properties are its



A twinned one inch crystal of titanite with adularia and clinocllore on matrix. from Tormiq Valley in northern Pakistan.

**crystal habit** (monoclinic—often wedge-shaped or tabular-shaped), color (yellow, green, brown, and black, with rare pink, orange, and red specimens), and luster (resinous to adamantine). It has one of the highest color dispersions (fire) of any mineral. Titanite is also pleochroic, with transparent specimens sometimes showing its three trichroic colors. Titanite is sometimes confused with sphalerite, especially when observing an adamantine to resinous luster. Sphalerite is softer than titanite, and often produces an odor of sulfur immediately after a streak test. Before 1982, the name "**sphene**" was common usage for this mineral. Then the International Mineralogical Association adopted the name "titanite" and discredited "sphene." Geologists and mineralogists worldwide quickly switched to the name "titanite" and it is now in common use. The name "sphene" is rarely seen in current publications. However, the name "sphene" is still the dominant usage in the gem, jewelry, and lapidary industries. There, a name change can cause severe disruption in marketing gemstone and jewelry products. Titanite has a chemical composition of  $\text{CaTiSiO}_5$

and sometimes contains rare earth elements such as cerium, niobium, and yttrium. It can contain other elements such as aluminum, chromium, fluorine, iron, magnesium, manganese, sodium, and zirconium. Iron has a strong influence on the color of titanite (small amounts of iron darken the color; yellow and green specimens have a low iron content, while brown and black specimens have a higher iron content).

Titanite is a rare mineral that occurs as an accessory mineral in a few igneous rocks, including granite, granodiorite, diorite, syenite, and nepheline syenite. It is sometimes present in marble or calcium-rich gneiss and schist, often occurring as individual grains. When abundant, its habit is usually granular to massive. The best crystals are usually found in marble. Unlike other titanium minerals, titanite is rarely found in river deposits because its cleavage, parting, and a low hardness (5-5.5) make it vulnerable to the abrasion of stream transport. In the gem and jewelry industries, sphene is a minor gemstone that is popular with collectors because of its high dispersion. Sphene is one of the few minerals with a dispersion higher than diamond (the dispersion of diamond is 0.044, while the dispersion of sphene is 0.051). Specimens of sphene with high clarity can display a strong, colorful fire when light is passed through them. Sphene is not commonly seen in jewelry because its low hardness along with its easy cleavage and parting make it too fragile for uses as a ring stone. Also, reliable supplies of cut stones in commercial quantities have not been developed, and the jewelry-buying public is unfamiliar with the gem. For these reasons, sphene has not become a mainstream gem that is commonly available in jewelry.



A 8 x 6 mm oval greenish yellow faceted sphene showing its very high dispersion, mined in Pakistan.

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

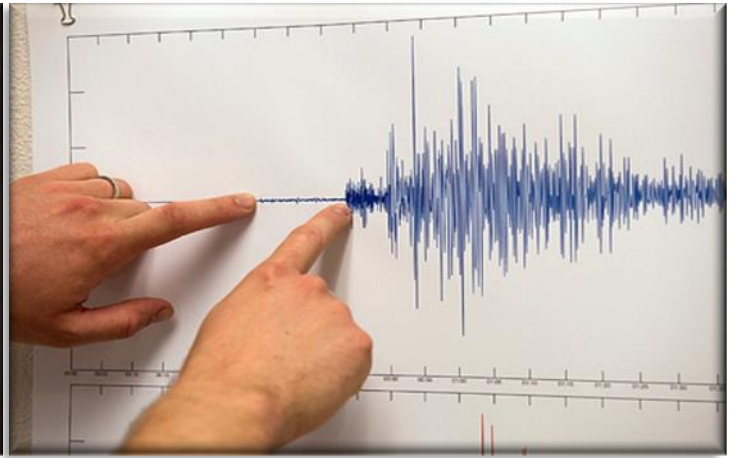
## What's New In Iowa Geology ??

# What's shaking at Trowbridge Hall

In the hall just outside the office of University of Iowa Department of Earth and Environmental Sciences professor Bill Barnhart a monitor hangs on the wall showing a wiggly blue line. This line is the signal from the University's first seismograph, located in the basement of Trowbridge Hall. Barnhart purchased the seismometer by winning a nearly \$10,000 grant from the College of Liberal



Bill Barnhart adjusts the university's first seismometer, tucked away in a basement corner in Trowbridge Hall.



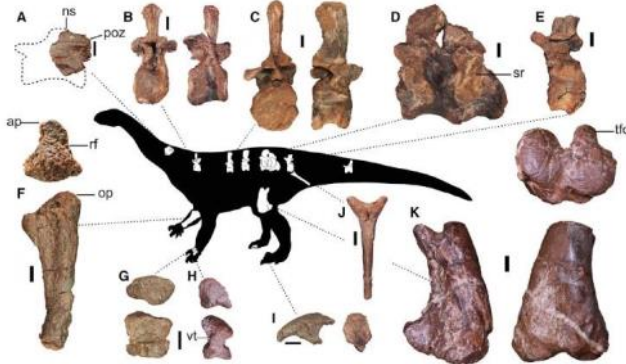
A printout from the earthquake that rattled Ecuador on April 17. The 7.8-magnitude temblor was detected by the UI's seismometer located at Trowbridge Hall.

Arts and Sciences stemming from student technology fees collected at the UI. He and other faculty in the department will incorporate the device and its recordings into an array of instruction at the UI, from undergraduate classes to advanced-level courses. *"Some of the best memories I have as a student is when an earthquake happened, and we could all see the seismic waves in real time,"* says Barnhart, who's active in the emerging field of induced seismicity, or human-triggered earthquakes. *"We'd all gather around (a monitor) and watch it. It's a great teachable moment, and I wanted our students to have that same type of experience."* Barnhart also will purchase a portable seismometer that he plans to use in his classes, and use it this fall to record the seismic "noise" created by the crowd at Iowa football games, a signal that he has tentatively christened a **"HawkQuake."** Last February, less than 24 hours after Barnhart had installed and tuned the seismometer, he got confirmation the device was working as hoped when a series of bright red, jagged, vertical lines popped up on his computer screen. The sensor had recorded a 5.1 magnitude earthquake in Oklahoma, the strongest tremor in the Midwest since a 5.6 magnitude temblor struck the same state in 2011. *"I was excited,"* said Barnhart, who saved the seismic recording. *"It was great to see that (the device) would record an earthquake. I was worried that it would record just building noise and students walking by."* Since then, the seismometer has detected more earthquakes around the Earth, including the recent earthquakes in Japan and Ecuador. Eliminating outside noise was a big reason why Barnhart located the seismometer in Trowbridge's brick, grotto-like basement. The device is housed in an insulated wooden crate where temperature and air pressure are kept constant. The seismometer looks like a sump pump, or, as Barnhart described it, *"our coffee can that sits on the ground."* Despite its rudimentary appearance, the UI seismometer is about as sensitive as most earthquake sensors used by the U.S. Geological Survey (the nation's pre-eminent earthquake-monitoring agency) and can detect quakes from anywhere on the planet. The seismometer's capabilities are somewhat limited by its location in an area with heavy foot and vehicle traffic and by the lack of precise climate control; but it performs as *"a research-grade seismometer,"* Barnhart said. The monitor in the hallway in Trowbridge has four panels: In the top right is a live feed of seismic activity being currently recorded by the Trowbridge basement seismometer. The bottom right is a readout of a recent earthquake. The upper left is a rotating display of information about global earthquakes and the UI Geophysics Research Program, while the lower left shows a week's worth of seismic activity on Earth. Barnhart hopes those images will excite students and interest them in earth sciences, just as he became captivated by what causes the ground to rumble and why. *"We know a lot about earthquakes, but the more we study them, the more questions are raised,"* he says. *"We don't know when they will happen or why we have small or big earthquakes."*

<https://now.uiowa.edu/2016/04/whats-shaking-at-trowbridge-hall>



## Slow (Thunder)Clap for New Giant Dinosaur *Ledumahadi*

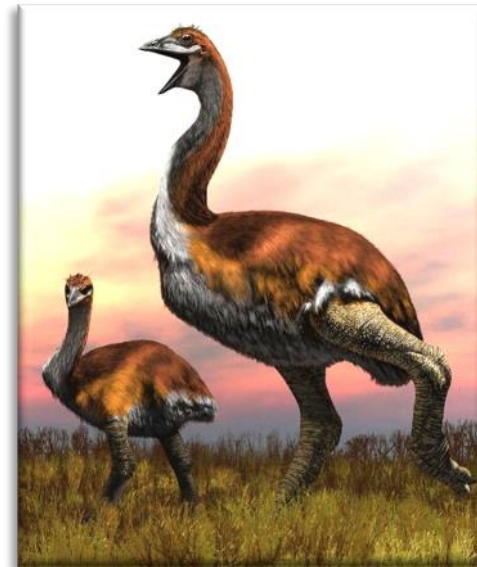


Sauropods are among the most iconic of dinosaurs; long-necked, long-tailed herbivores that evolved into the largest land animals the planet has ever seen. They were essentially the cows of their day. Very, very big cows. But they didn't start out that way. A new dinosaur unearthed in South Africa revealed a new plot twist to the sauropod story. *Ledumahadi mafube*, the "giant thunderclap at dawn," weighed in at about 13 tons (26,000 pounds), only about a fifth as big as the largest sauropods which show up much later in the fossil record, but still one big animal. What makes *Ledumahadi* significant is its body plan. The large dinosaur was a **sauropodomorph** (a precursor to sauropods) but it revealed that it was possible to obtain enormous size much earlier and without key anatomical adaptations thought necessary. Very earliest sauropodomorphs were bipedal, getting around on two legs, and many paleontologists believed their initial body plan limited their size. The extreme size seen in the later sauropods was only possible, the thinking went, because they had already evolved adaptations to support that much weight. *Ledumahadi* roamed what's now South Africa about 200 million years ago, in the earliest Jurassic Period. And while sauropods (like elephants today) had four column-like limbs to support tremendous amounts of weight, *Ledumahadi* had flexed limbs. (**Note:** flexed limbs have a greater range of motion, for example, most mammals today.) The anatomical traits possessed by *Ledumahadi* were unique in the fossil record, providing more evidence that quadrupedalism evolved multiple times and in multiple ways among sauropodomorphs. Lineages like *Ledumahadi* died off before evolving into proper sauropods. Researchers call *Ledumahadi* the "largest land animal of its time," attaining a size previously thought impossible based on its anatomy. It joins 10-ton *Ingentia prima*, announced in July, as the latest sauropodomorphs to show scientists there was more than one path to greatness.

<http://blogs.discovermagazine.com/deadthings/2018/09/27/ledumahadi/#more-2905>

## Vorombe titan: Researchers Name World's Largest Bird Ever

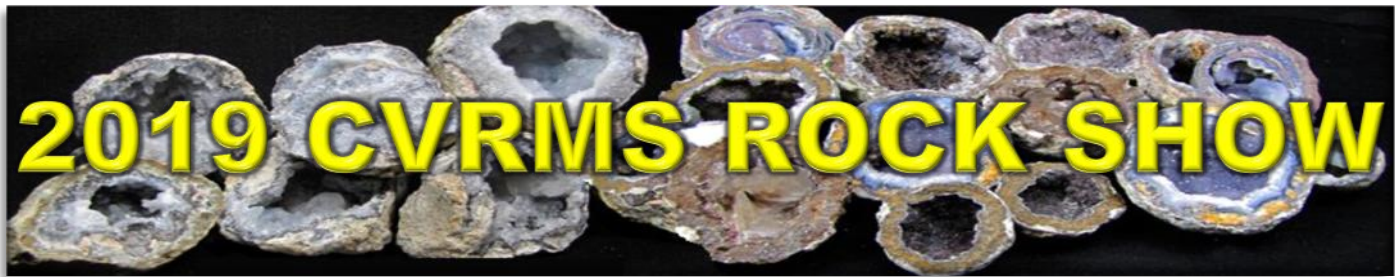
After decades of conflicting evidence and numerous publications, a team of researchers at the Zoological Society of London's Institute of Zoology has finally put the 'world's largest bird' debate to rest. The first species of elephant bird to be described, *Aepyornis maximus*,



has often been considered to be the world's largest bird. In 1894, British scientist C.W. Andrews described an even larger species, *Aepyornis titan*, which has usually been dismissed as an unusually large specimen of *Aepyornis maximus*. However, the new study, led by James Hansford, reveals *Aepyornis titan* was indeed a

distinct species. Now named **Vorombe titan** (meaning 'big bird' in Malagasy and Greek), the species had a body mass of 1800 lbs and grew up to 10 feet tall. "Elephant birds were the biggest of Madagascar's megafauna and arguably one of the most important in the islands evolutionary history — even more so than lemurs," Hansford said. "This is because large-bodied animals have an enormous impact on the wider ecosystem they live in via controlling vegetation through eating plants, spreading biomass and dispersing seeds through defecation." "Madagascar is still suffering the effects of the extinction of these birds today." In the study, Hansford and his colleague, Professor Samuel Turvey, analyzed hundreds of elephant bird bones from museums across the globe to uncover the world's largest bird, while also revealing their taxonomy is in fact spread across three genera and at least four distinct species; thus, constituting the first taxonomic reassessment of the family in over 80 years. "Without an accurate understanding of past species diversity, we can't properly understand evolution or ecology in unique island systems such as Madagascar or reconstruct exactly what's been lost since human arrival on these islands," Professor Turvey said. "Knowing the history of biodiversity loss is essential to determine how to conserve today's threatened species."

<http://www.sci-news.com/paleontology/vorombe-titan-06454.html>



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 4:00pm 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>TO IOWA CITY 19 Miles</p>	<p><b>CHILDREN MUST BE ACCOMPANIED BY AN ADULT</b>  <b>ONLY SERVICE DOGS ALLOWED</b></p>																												
<p><b>PROFITS GO TO SCHOLARSHIPS</b>                  NOT RESPONSIBLE FOR ACCIDENTS</p>																														

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

## AMERICAN FEDERATION OF MINERAL SOCIETIES NATIONAL SHOW

and the

## MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES ANNUAL MEETING

March 21-24, 2019 Ramada, Cedar Rapids

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

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

The Milwaukee Museum Field Trip Bus  
will leave from Cedar Valley World Travel  
6100 7th St SW, Cedar Rapids  
Sun. Nov. 4—6:30 a.m.—return: ~ 9:00 p.m.  
Pickup & drop-off in Anamosa—7:00a.m.—8:30p.m.  
*monitored parking available*



Seats are full and everyone is anxious for the 2018 incarnation of **"Bill's Big Bus Boogie,"** the CVMRS members' field trip to the **Milwaukee County Museum** on Sunday, **November 4, 2018**. The museum features the **Hebior Mammoth**, a fossil found less than 30 miles from the Museum on a farm in the small town of Paris in Kenosha County, that is among a group of important finds that help date the early presence of humans in North America. One popular display is **"Continents, Oceans and Life in Motion: A New View of the Third Planet,"** the first museum display in North America to use plate tectonics as a central theme for the presentation of earth science to the public. The Museum's 150,000 square feet of exhibit space also includes an opportunity to visit **Africa**, stroll through the bustling **Streets of Old Milwaukee** of a century past, witness a **modern-day pow-wow**, stroll amid free-flying butterflies from around the world in the **Puelicher Butterfly Wing**, and **more!** The temporary exhibit **"Maya: Hidden Worlds Revealed"** is open, allowing visitors to rediscover this ancient civilization, view hundreds of authentic artifacts, and participate in hands-on activities such as exploring tombs or building an arch, & more. A new **Special Frog Exhibit will be Available for Our Visit!** Brilliant orange, bright blue, dazzling red; frogs in an astonishing array of colors! This vivid assortment of hues hints at the remarkable diversity that exists among the frog species. From lush rainforests to parched deserts, frogs survive in nearly every environment on Earth, using surprising to bizarre strategies.

Learn more about the Frog Exhibit at [www.mpm.edu](http://www.mpm.edu).

**Remember! Daylight savings time ends Nov. 4, so 6:30 am will feel like 7:30 am!**

## 2018 Officers, Directors, and Committee Chairs

President .....	Marv Houg ( <a href="mailto:m_houg@yahoo.com">m_houg@yahoo.com</a> ).....	(319)364-2868
Vice President. ...	Ray Anderson ( <a href="mailto:rockdoc.anderson@gmail.com">rockdoc.anderson@gmail.com</a> ) .....	337-2798
Treasurer .....	Dale Stout ( <a href="mailto:dhstout55@aol.com">dhstout55@aol.com</a> ).....	365-7798
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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:vavraj@gmail.com">vavraj@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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