

# Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

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

CEDAR VALLEY GEMS

MAY 2018

VOL. 44, ISSUE 5

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## Next CVRMS Meeting Tuesday May 15

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

*featured speaker:*

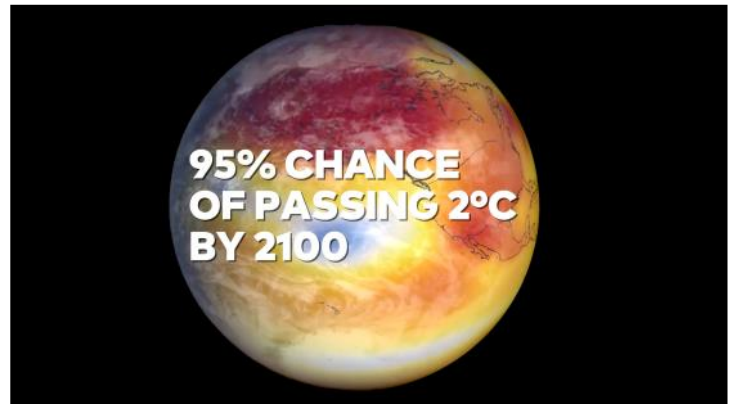
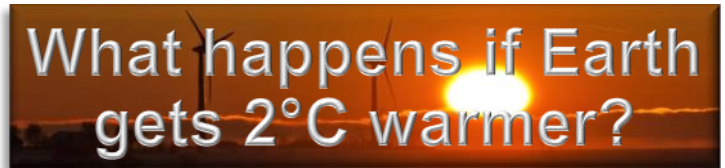
**Ray Anderson**

CVRMS Vice President

## The Geology of Devonian Fossil Gorge



The US Army Corps of Engineers at the Coralville Dam has recruited new Rangers and asked Ray to present a program on *the Geology of Devonian Fossil Gorge* and lead a tour to train these new employees to assist the public with questions about the rocks at the Gorge. He has produced a new program on the geology of the Gorge and will present it with appropriate background information at the May CVRMS monthly meeting.



*"If the world gets warmer by two degrees Celsius, we're screwed,"* says Jason Lederman in [Popular Science.com](http://PopularScience.com). To prevent that, the United Nations signed the Paris Agreement, an international treaty designed to keep the average global temperature "well below 2°C above pre-industrial levels" (temperatures on Earth before factories started spewing greenhouse gases into the air). Over the last 20 years, that two-degree threshold has been referenced in policies and agreements made by the Council of the European Union, the G8 (now the G7), and more. So what makes two degrees so important? It all started in 1975 with Dr. William Nordhaus and his colleagues in the International Institute for Applied Systems Analysis publishing [Can We Control Carbon Dioxide?](#) which said that an increase in the global average temperature of 2°C (caused by man-made carbon dioxide) would change our climate in ways not seen for *"the last several hundred thousand years."* The last time the Earth was as warm as it is today was over [11,000 years ago](#). An average temperatures rise of three degrees, four degrees, or higher could lead to **"substantial species extinctions, large risks to global and regional food security,"** and an inability to work outside—and live—in some areas of the world. [Studies based on IPCC data](#) say there's a 95% chance we'll pass 2°C by the year 2100—and the detrimental effects of climate change may be unavoidable. We do have the power to lower our emissions and keep the worst possible warming at bay. **But we're running out of time.**

## CVRMS April 17 Meeting

### Hiawatha Community Center

Called by President Marv Houg at 7:18  
at Hiawatha Community Center

**THE MEETING WAS CALLED TO ORDER** at 7:20 p.m. by Marv Houg President.

**GUESTS:** There were four guests/new members introduced: Louis Scherbaum, Al and Laura Eilers, and Mary Jane Leary. Welcome to all.

**MINUTES:** The minutes of the last meeting were reviewed as published and no questions or concerns were voiced. Motion to accept made by Jay, second by Tom. Approved as published.

**TREASURER'S REPORT:** The treasurer's report was presented by Dale Stout. The current checking account balance is \$22,611. A preliminary report regarding the March show was distributed and reviewed. Even though we had a rough beginning with the weather, we still had a net income of approximately \$7500. Marv reviewed our current scholarship program and the Board will review our financial status and the impact, if any, of this year's show.

**PROGRAM:** Ray Anderson gave us a preview of his Iowa Academy of Science talk about *Crinoids; Iowa State Fossil?* Then presented a YouTube video on *Crinoids; Living Fossils*, Interesting and educational for all.

**DOOR PRIZE:** Lewis Scherbaum (new member)

### NEW BUSINESS

**SHOW 2019:** A motion made by Jay with second by Julie that we will have our annual show in 2019. Discussion followed regarding general information from Tom regarding the American Federation and the Midwest Federation on Friday and Saturday respectively. We need a theme. Motion passed.

**AUCTION:** September 15-16. Marv reported about 1000 lots have been committed so far, with a few more yet to committed.

**FIELD TRIPS:** None planned because of weather. November bus trip.

**"BILLS BIG BUS BOOGIE"** - November 4 field trip to the Milwaukee Museum. Karen has sign up sheet. Last year's trip to Rock Island and Chicago was a success and enjoyed by all.

**MISCELLANEOUS:** Tom showed flyer advertising a Rock Swap in Missouri June 8,9,10.

**ADJOURNMENT:** Motion to adjourn by AJ, second by Tom. Meeting adjourned 9:15pm.

Respectfully submitted,  
Dell James, secretary

## CVRMS Board Minutes Apr.24

**Members present:** Marv Houg, Dale Stout, Ray Anderson, Bill Desmarais, Jay Vavra, Sharon Sonnleitner, Dell James, Rick Austin

**MEETING CALLED TO ORDER** 7:05pm

**SHOW REPORT:** General discussion regarding negotiations with Hawkeye Downs after the show to reduce some show costs. No contract yet for the 2019 show. General discussion ensued regarding the amount to be paid for program presenters. Seven programs were presented at the show. Also, at CVRMS request Augustana College, Beloit College, University of Iowa provided spectacular exhibits for the show. Motion made by Bill second by Ray to pay presenters \$50 per program and donate \$150 each to the schools who contributed exhibits. Discussion followed regarding whether we are setting a precedent? How do we decide who gets what.? Votes: Ayes-6, Nays-1, Abstain-1. Motion passed.

**SCHOLARSHIPS:** The club's usual scholarship awards are: University of Iowa-\$4000, Cornell-\$3000, VAST- \$1500. Motion made by Bill, second by Ray that the club would continue with these amounts. Motion passed.

**AUCTION:** Marv and Sharon confirmed that the auction is now basically full with about 1200 lots. Discussion regarding food service during the auction. Dell suggested contacting a food truck that she is familiar with. She will contact. Dell will supply the Friday worker lunch.

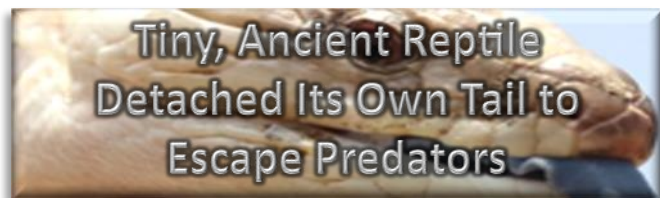
**BILLS BIG BUS BOOGIE:** Bill reported that the bus is half full and sign up has just begun. Reminder that the trip is to Milwaukee Museum and entry fee is \$5.

**2019 SHOW** The club has a motel in mind, not confirmed, for meeting rooms, etc. Discussion regarding show theme. Ray suggested geodes as a theme. Last highlighted in 2012. It is an easy theme to put together with plenty of material, and it is our state Rock. Discussion regarding exhibits and whether the federation will have competitive exhibits. Sharon has preliminary layout planned. Ray made motion, second by Bill, to use Iowa State Rock, Geode, as our theme. Motion passed. Recommendation will be made at next meeting for approval.

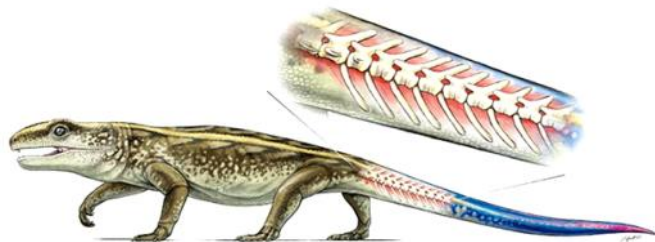
**FIELD TRIPS:** River Products has requested Club help for the TAKO (take a kid outdoors) on July 14 at the Klein Quarry. Ray, Bill, Marv, Dale volunteered. Anyone else interested can talk to Marv. Marv has organized a day field trip to Klein Quarry on May 20. Dale will send out emails. All rules apply. Contact Marv if interested. Marv needs suggestions for other sites. Jay suggested Jessop for geodes. Watch for Poison Ivy! Marv will check. Monticello? Any other suggestions, let Marv know.

**MISCELLANEOUS** Linn County Fair asked if the club would have an activity/exhibit on June 29. Many rules to follow and logistical, could we do it? Tabled until next meeting. Memorial donations have not been paid. Dale will look into and handle. Picnics-reservations not yet made. Dale will arrange for sites. Midwest Federation is meeting in Decatur, Illinois, on October 6. Anyone interested in being a delegate? Motion to adjourn by Bill, second by Jay. Meeting adjourned 9:15pm.

Respectively submitted,  
Dell James, secretary



An analysis of 70 chunks of tail bones has uncovered a special characteristic of an ancient reptile known as *Captorhinus*. The ancient fossils reveal it had an escape trick to get away from



A trove of fossils in Richards Spur, Oklahoma revealed that ancient reptiles had detachable tails

larger, meat-eating predators: it detached its tail and scurried away. University of Toronto researchers led the study, which was published Monday in *Scientific Reports*. The tiny reptile—a mere 4.5 pounds—lived 289 million years ago, but the so-called “cracks” in its tail helping it run away made the reptile rather successful. By the end of the Permian period 251 million years ago, captorhinids could be found across Pangaea, the ancient supercontinent. The feature that aided its success is comparable to a paper towel. The perforated line keeping paper towels attached but easily pulled apart is how the bone structure of these reptile tails were built. “If a predator grabbed hold of one of these reptiles, the vertebra would break at the crack and the tail would drop off, allowing the captorhinid to escape relatively unharmed,” said Robert Reisz, biology professor at University of Toronto Mississauga. Though the trait is beneficial for survival, it died out of the fossil record eventually. Some 70 million years ago, the trait reappeared in lizards and many current species have the trait, too. “Like many present-day lizard species, such as skinks, that can detach their tails to escape or distract a predator, the middle of the tail vertebrae had cracks in them,” lead author and postdoctoral student Aaron LeBlanc said in a statement. This small reptile, however, is the oldest known species to have this tail trait. The researchers also discovered that the reptiles’ tails changed as they aged. Adults would grow out of the detachable tail characteristic—the cracks often appeared like they were fused together. Researchers say this is logical since the youth were most at risk of being eaten. So the evidence from these fossils shows that their small size didn’t stop captorhinids from becoming the most common reptile of their time across Pangaea during the Permian.

<http://www.newsweek.com/tiny-ancient-reptile-detach-tail-escape-meat-eating-predators-833432>



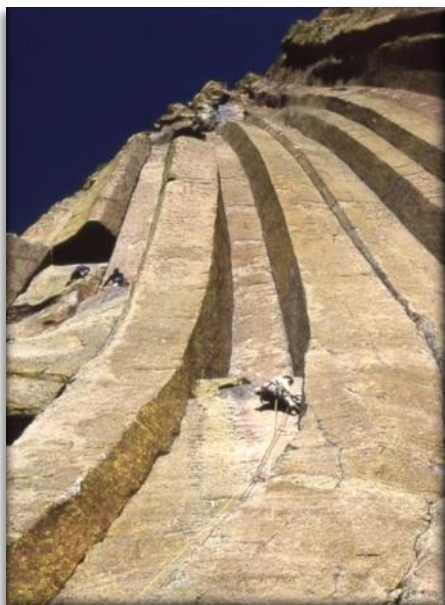
May's birthstone, the emerald, is one of the most regal of all gemstones, one which denotes life and love. It is also one of the most valuable (*the very highest quality emeralds can be more expensive than diamonds*). Emeralds are the deep green variety of the mineral beryl [ $\text{Be}_3\text{Al}_2(\text{Si}_6\text{O}_{18})$ ], 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. The emerald supply at, “*Cleopatra's Mines*” in Egypt were depleted by the ancient Egyptians, so by the time it was 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 the Elder remarked that green “*gladdened the eye without tiring it!*” The emerald 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 American jewelry industry changed the



*The world's largest uncut emerald*

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 geologic feature ??

### March's Photo



Last month's "What in the World?" image was a photo of a 35 foot-wide basalt dike intruded into red layered volcanic ash deposits behind a stone wall on the Canary Island of La Gomera. The contact between the units is very clean and sharp. Photo by Greek photographer Miltos Andreadis.

## Rock Calendar 2018

### CVRMS EVENTS OF INTEREST

**May 15 - CVRMS Monthly Meeting**

Feature Program

**"Geology of Devonian Fossil Gorge"**

Hiawatha Community Center 7:15 pm

**May 20 - - CVRMS Field Trip—Klein Q.**

Collecting Trip for Members

see p. 9 for details

**June 8-9 - Missouri Mines Rock Swap**

Missouri Mines State Historic Site  
south side of Hwy. 32, 1.5 mi. west of US Hwy 67  
south of Park Hills, MO

**June 19 - CVRMS Monthly Meeting**

Picnic at Ellis Park Overlook

**"rock cutting and polishing"**

**July 14 - TAKO "Rockin' Rocks and Fossils"**

CVRMS volunteers needed

see p. 9 for details

**July 17 - CVRMS Monthly Meeting**

Picnic at Squaw Creek Meadowlark Pavilion

**"geode cracking"**

**August 21 - CVRMS Monthly Meeting**

Picnic at Morgan Creek

**"bingo"**

**Sept. 18 - CVRMS Monthly Meeting**

Feature Program

**Dr. Steve Spangler, "The Exoplanets"**

Hiawatha Community Center 7:15 pm

**Sept. 15-16—CVRMS Rock Auction**

Amana RV Park and Event Center  
Amana, Iowa

**Oct. 16 - CVRMS Monthly Meeting**

Feature Program

**"To Be Announced"**

Hiawatha Community Center 7:15 pm

**Nov. 4—CVRMS Fall Field Trip**

**Milwaukee Public Museum**

Milwaukee, Wisconsin

see p. 11 for details



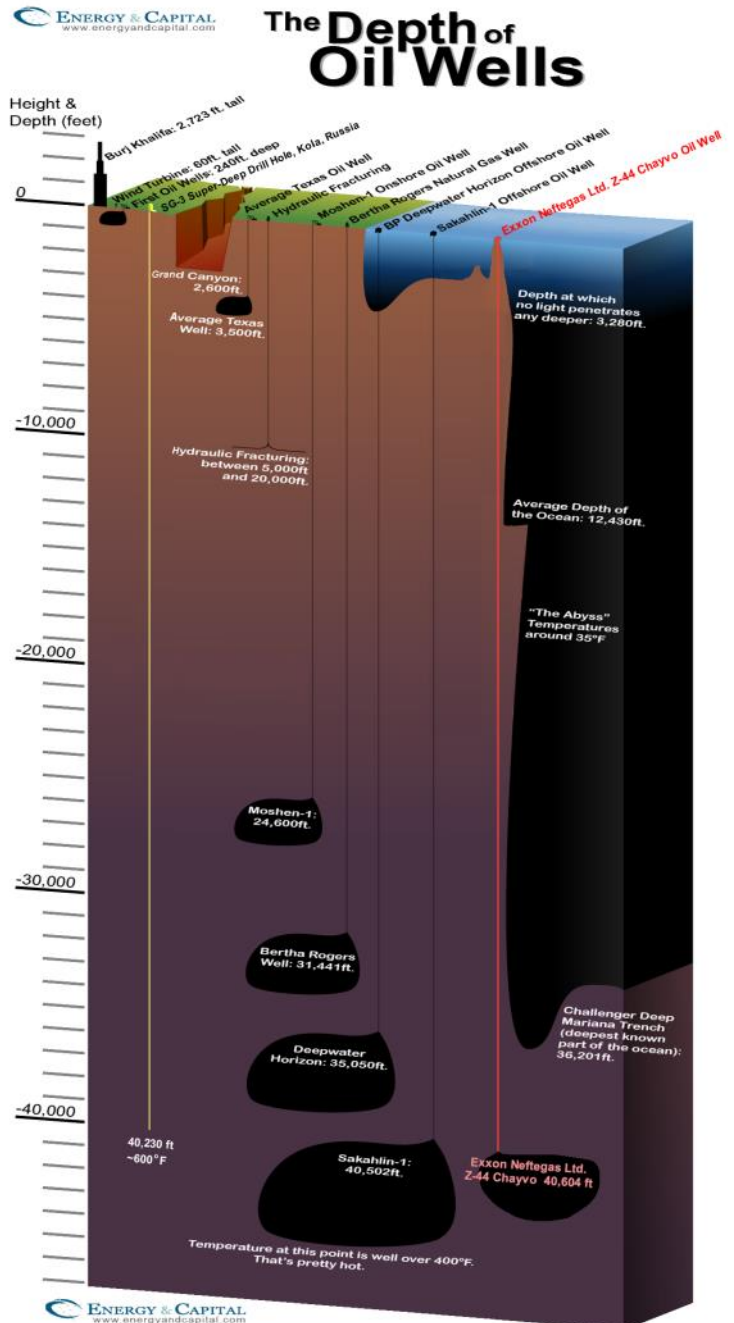
# Ask a Geologist

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

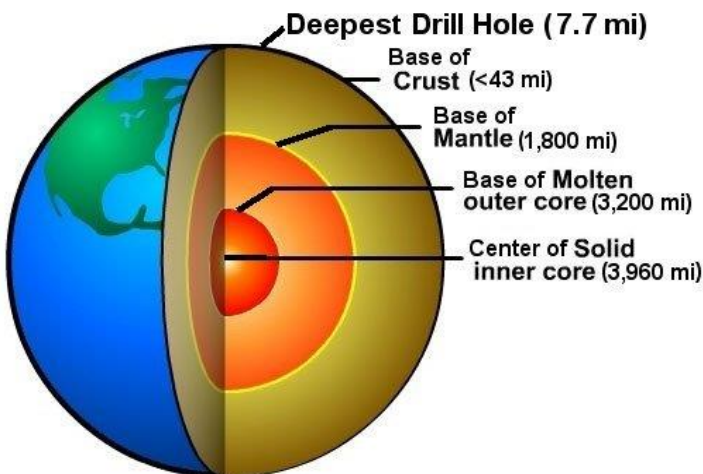
Ask a Geologist is a monthly column that gives CVRMS members an opportunity to learn more about a geologic topic. If you have a question that you would like addressed, please send it to [rockdoc.anderson@gmail.com](mailto:rockdoc.anderson@gmail.com), and every month I will answer one in this column. 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: "Could scientists drill a hole to the center of the Earth ??"

Rock Doc replied: "Nowhere close. Currently, the deepest drill holes are oil and gas exploration wells. The Exxon Neftegas Z-44 Chayvo oil well off Sakhalin Island in the Russian Far East reached an astonishing total depth of 40,604 ft (7.7 mi), the world's deepest well. At that depth the temperature was nearly at the upper limit for current drilling technology, about 600°F (temperature goes up about 1.5°F /100 feet in depth). Eventually technology will improve and we will be able to drill a little deeper. This well, completed in 2017 and a few previous wells surpassed the depth of the SG-3 Superdeep drill hole, a Russian attempt to drill to the mantle on the Kola Peninsula which was abandoned at a depth of 40,230 ft in 1989. A well drilled to the center of the Earth would encounter temperatures over 1,000°F at the base of the crust (~43 mi). As it penetrated into the mantle it would be passing through rock with the consistency of silly putty that would squeeze the hole shut, and temperatures would rise to over 7,230 °F at the boundary with the core (~1,800 mi). It would then have to pass thru a molten iron outer core and a solid inner core now estimated to be about 10,800 °F to reach the center of the Earth at about (~4,108 mi). That's as hot as the surface of the sun. Tough drilling conditions! The illustration on the right shows the depth of some of the deepest oil wells compared to the depth of the Kona research well and the depth of the Grand Canyon and for scale the height of the tallest building on Earth. So far no well has penetrated through the crust and into the mantle, but such a hole is possible in selected areas where the crust is comparatively thin and cool.



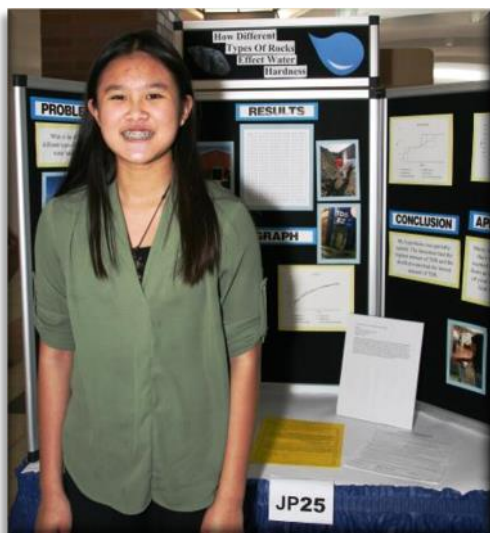
## Cross Section of the Earth



## 2018 Eastern Iowa Science & Engineering Fair Award Winner



The Cedar Valley Rocks and Minerals Society continued its support of area science education by participating as a prize and donor sponsor of the 2018 Eastern Iowa Science & Engineering Fair. The Society awarded a "1st Place Junior Geology-Related Project" certificate along with a cash prize of \$50.00 to Emmy Liu from Central Lee MS, Donnellson, for her entry "How Do Different Types of Rocks Affect Water Hardness."



Her entry was completed under the supervision of Nadine Weirather. Emmy's original hypothesis was that sandstone placed in distilled water would produce more total dissolved solids (TDS) over the 19-day duration of her experiment than would limestone, under the same conditions. She reasoned that the sandstone (based on the compressed sandstone she found from a huge working sand pile) was more porous than her limestone samples (from a nearby quarry), and so would have a greater overall surface area. Her actual results showed the opposite, and by a large margin. One of her conclusions was that some other factor(s) besides surface area must be in play here. In addition to the award from our Society, Emmy also received the following awards for her entry: EISEF (Class I, Junior Physical); Association for Women Geoscientists (Outstanding Achievement); and Broadcom Masters (Outstanding Achievement).

Although there was a provision for a total of \$160 in prize money (two senior and two junior prizes), a lack of relevant entries limited the total amount actually awarded. Along with this cash prize, the Society donated \$40.00 for general use by the Eastern Iowa Science & Engineering Fair organization. The remaining \$110 was returned to the Society's coffers.

Bill Sonnleitner

## Woman's \$15 Ring Worth \$455,000

So 30 years ago, when one London woman found a huge, gorgeous and fake diamond ring at a flea market, she knew she just had to have it. After negotiating a \$15 price the ring became the woman's most coveted staple, even during the most "mundane activities." But decades later, after a jeweler suggested that the ring might not be so fake after all, the woman had the ring appraised -- and it turns out that the costume gem was in fact a very not fake, but a 26.27-carat diamond. The ring is now in the possession of Sotheby's London, where it will be auctioned on June 7. Jessica Wyndham, a representative for Sotheby's London, explained that the ring was most likely cut in the 19th century, explaining why it was able to go unnoticed for so long: *"With an old style of cutting, an antique cushion shape, the light doesn't reflect back as much as it would from a modern stone cutting.*



*Cutters worked more with the natural shape of the crystal, to conserve as much weight of the crystal rather than make it as brilliant as possible.*" The ring is estimated to go for up to \$455,000. And as for the lucky woman who found the gem so many years ago, she's chosen to remain anonymous.

<https://www.aol.com/article/finance/2017/05/22/woman-finds-that-her-fake-diamond-ring-from-30-years-ago-is-actu/22104158/>



Can tumors teach us about animal evolution on Earth? Researchers have presented a novel hypothesis of why animal diversity increased dramatically on Earth about half a billion years ago. A biological innovation may have been key. A transdisciplinary and international team presented their findings in *Nature Ecology and Evolution*. The new hypothesis holds that the dramatic diversification of animals resulted from a revolution within the animals' own biology, rather than in the surrounding chemistry on Earth's surface. Life on Earth was dominated by microbes for roughly 4 billion years when multicellular life suddenly made a vigorous entry. Why animals diversified so late and so dramatically has remained unresolved and is a matter of hot debate. The diversification of animals occurred over a geologically short period of time (from about 540 to 500 million years ago), known as the **Cambrian explosion**. Many geologists have assumed that the Cambrian explosion was triggered by an increase of atmospheric oxygen. However, a causative relationship between the Cambrian explosion and increasing atmospheric oxygen has not been



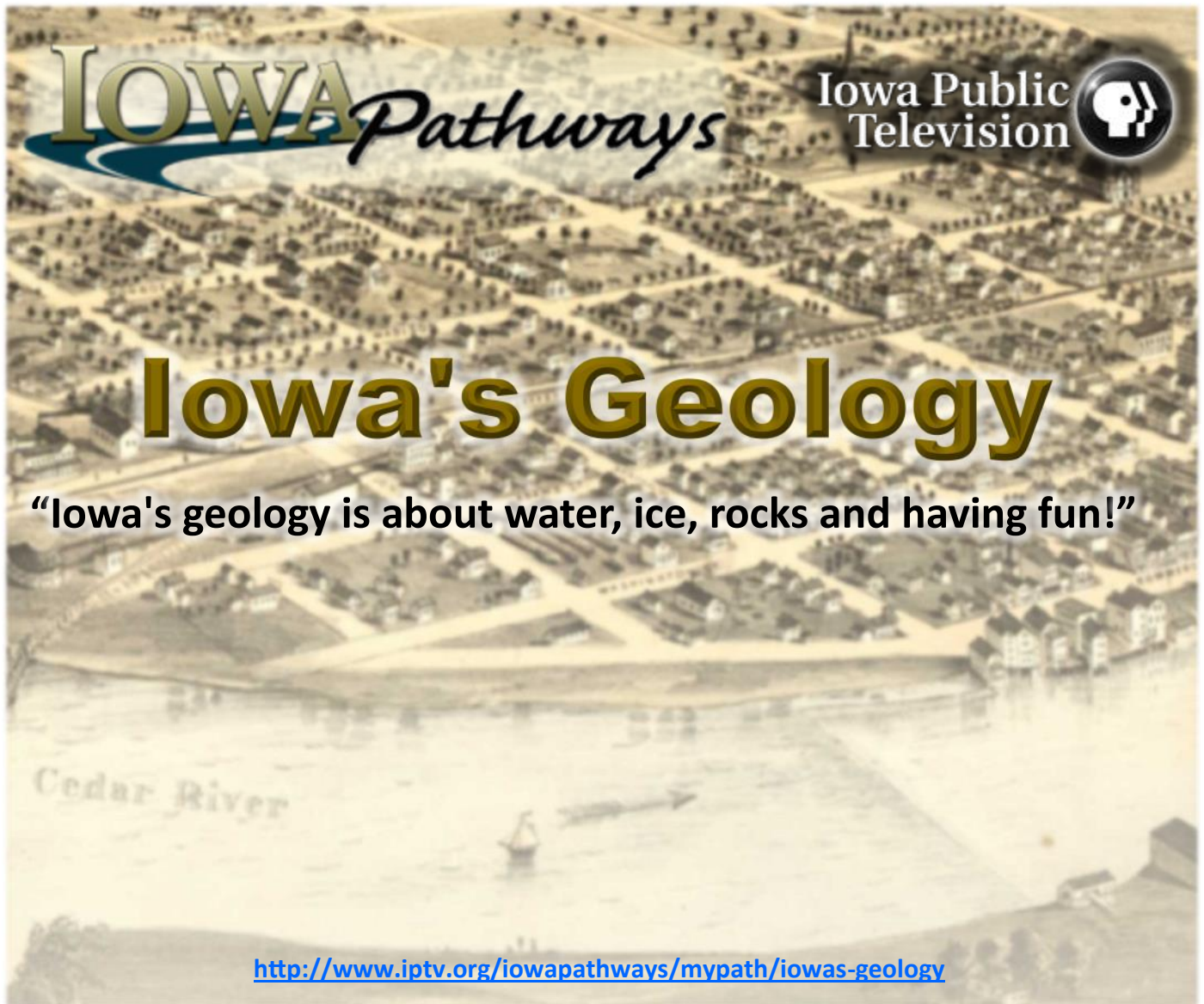
*Life on Earth was dominated by microbes for roughly 4 billion years when multicellular life suddenly - then in the form of animals in robust ecosystems - made a vigorous entry. Why animals diversified so late and so dramatically has remained unresolved and is a matter of hot debate*

proven. Indeed, research over the last years has weakened the support for a correlation. Dramatic changes in atmospheric oxygen are noted both before and after the Cambrian, but not specifically when animal diversification took off. Also, simple animals required surprisingly low oxygen levels, which was present well before the Cambrian. In order to understand more about the conditions for multicellular life, researchers contacted tumor biologist, Professor Sven Pahlman at Lund University, who has explored the importance of low oxygen concentrations, or so-called hypoxia, in the tumor setting for nearly two decades. Using novel clues from the field of tumor biology, the team tackled the historic question of why animals developed so late and dramatically. Specifically, they tested whether the same molecular tools exploited by many tumors to maintain stem cell properties could also be relevant to the success of animals in the Cambrian explosion. Cells with stem cell properties are vital for all multicellular life in order to regenerate tissue. For example, cells in the wall of human small intestine are replaced every 2-4 days, through the division of stem cells. Hypoxia is generally seen as a threat to most life forms, but low levels of oxygen during certain periods and settings are required for multicellular life. Our stem cells, the cells that form new tissue, are extremely sensitive to oxygen. The stem cells therefore have various systems for dealing with both too much and too little oxygen, which is clear in the case of tumors. These systems utilize a protein that can 'fool' cells into acting as if the setting was hypoxic.

It can also fool cells into adopting stem cell-like properties. By studying the ability of tumor cells to imitate the properties of stem cells, the team has observed how tumor cells can high-jack specific mechanisms that evade the negative effects that high oxygen has on stem cells. As a consequence, the tumor cells are able to maintain stem cell properties, despite being surrounded by the high oxygen concentrations that are present in the body. This same ability may have been one of the keys that also made animals so successful. The ability to adopt stem cell properties despite high oxygen levels, called "*pseudohypoxia*," is also present in normal vertebrate tissue. Therefore, while low oxygen is generally not a problem for animal cells, the oxic settings posed a fundamental challenge for complex multicellularity. Without the *pseudohypoxia* tools, the oxic setting makes tissue-specific stem cells mature too early. The new hypothesis gives credit to a biological innovation for triggering animal diversification. The presence of free oxygen is just the result of some microbes finding a way to use sunlight to obtain energy; a totally separate biological event. This view fits with other geobiological observations, such as that environments with 'enough' oxygen have been present on Earth since long before the Cambrian explosion. The hypothesis also has implications for how animals may have varying capacities to live in oxygenated environments, and perhaps even for how we see cancer as an evolutionary consequence of our ability to live in oxygenated niches. Taking an evolutionary approach is unusual for cancer researchers, even though the development of tumors is generally seen as an evolutionary process. Similarly, geobiological researchers rarely apply the cellular perspective. But having combined their expertise, researchers were surprised that others had not previously wondered about our paradoxical ability to renew tissue in the oxic setting. Once you flip the perspective on the oxic niche, and start to consider it as challenging for stem cell properties and tissue renewal, then puzzling observations from distant fields start to fit together.

[http://www.spacedaily.com/reports/Novel\\_hypothesis\\_on\\_why\\_animals\\_diversified\\_on\\_Earth\\_999.html](http://www.spacedaily.com/reports/Novel_hypothesis_on_why_animals_diversified_on_Earth_999.html)

## What's New In Iowa Geology ??



Iowa Public Television's ***Iowa Pathways*** is an on-line learning environment that guides the user to discover the people, places, events, and ideas of Iowa history through hundreds of interconnected articles, supported with images, websites and connections to related topics. This month's "***What's new in Iowa geology??***" features the Iowa Pathways web page on [Iowa's Geology](http://www.iptv.org/iowapathways/mypath/iowas-geology). It begins by telling us that, "*The story of Iowa started long before people ever lived on the land. Iowa's land has formed through a slow and never-ending process. Geologists believe that earthquakes, volcanoes, floods and ice helped form and change Iowa for over 1 billion years. These processes formed the base for Iowa's farming success, mining industries and even some art forms.*" The site offers pathways (links) to sections on such topics as [Environment](#), [Iowa Soils](#), [Iowa's Habitats](#), [Lead Mining](#), and [Weather](#). It's a neat little page that will provide hours of fun browsing.



## Michigan Nickel Mine Begins Tunnel Project

Michigan's first new mine in decades has begun a multi-year tunneling project to reach a second ore deposit. Toronto-based Lundin Mining Corp is finishing the tunnel to the second ore body, a high-grade nickel and copper



A long view in the mine as machinery drills into rock and slowly works its way toward the ore deposits in the Kennecott Eagle Mine in Michigamme Township

deposit called Eagle East. The Eagle Mine began extracting nickel, copper and other metals from the original deposit in 2014. The second deposit was discovered in 2015, about a mile east of the Eagle Mine site about 2,500 feet below the original deposit. The Eagle deposit is hosted by two **peridotite** intrusions historically known as the Yellow Dog Peridotites. Economic minerals are primarily **pentlandite** and **chalcopyrite** in **pyrrhotite** dominated massive, semi-massive and disseminated sulfides. Three distinct types of sulfide mineralization occur at the Eagle deposit. They are described as disseminated, semi-massive and massive sulfide. Each of the mineralization types has unique features and the boundaries between them are sharp. Disseminated Sulfide including scattered blebs of sulfide are found throughout the **peridotite** sections of both of the Yellow Dog intrusions. The Sulfide blebs, which can be up to a centimeter or more, are comprised dominantly of **pyrrhotite** with lesser **chalcopyrite** and **pentlandite**. **Pentlandite** occurs principally as coarse, granular crystals and minor exsolution laminae in **pyrrhotite**. Minor **violarite** replaces **pentlandite** along fractures in granular crystals. **Chalcopyrite** is also granular and contains minor exsolution laminae of **cubanite**. **Chalcopyrite** also occurs as **myrmekitic** intergrowths with **magnetite**. The tunnel between the two deposits is expected to take up to three years to finish. A mine spokesman said developing Eagle East will extend the mine's lifespan into 2023. <https://www.freep.com/story/news/local/michigan/2017/03/14/michigan-nickel-eagle-mine/99155108/>

## Field Trips

### May 20 - - CVRMS Field Trip—Klein Quarry

CVRMS is sponsoring a collecting trip to River Products Klein Quarry on Sunday, May 20, for CVRMS members. The quarry is located at 3445 Deer Creek Rd SE, off Highway 6 (2nd Ave.) in Coralville. **An attendance limit of 60 people is being imposed by the quarry management. So please contact Marv Houg if you plan to attend with the names of all participants; [m\\_houg@yahoo.com](mailto:m_houg@yahoo.com) or telephone: 319-364-2868. First come - first served but you must call or email ahead of time.**

Download & fill out the club liability waiver at

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

Meet at the parking area just inside the quarry entrance at 8:45 to sign in and get safety instructions. Enter the quarry at 9:00. This is a lock-in quarry; that is, the gate is locked behind us and no one can enter or leave (except in an emergency) until noon, when a group will be let out. Others can come in at that time if they are waiting at the gate. The rest of the group will leave at about 4:00. **Requirements are that you must be a member of the Cedar Valley Rocks and Minerals Society and sign a waiver.** Also we are going to be enforcing strict safety requirements such as everyone **must have** a **hard hat** on, **safety glasses**, a **bright safety vest**, and **hard shoes** (steel toed is preferred). No open toed sandals or tennis shoes will be allowed. Also **long pants** will be required, no shorts will be allowed.

#### **NO EXCEPTIONS TO THESE RULES.**

Please stay away from the walls at all times, as loose rocks and boulders do fall and walls spontaneously collapse.

This is a "hard-rock" working quarry. All field trippers must have the appropriate safety equipment. All children should be closely supervised. Possible finds include: millerite, coral heads, horn corals, brachiopods, bryozoans, trilobites, crinoids and maybe cephalopods, fish parts, blastoids, and cystoids. Useful tools include: rock hammers, cold chisels, sledges and pry bars. Bring your own water and lunch.

### July 14 - TAKO "Rockin' Rocks and Fossils"

TAKO (Take A Kid Outdoors) is an organization based in Iowa dedicated to providing outdoor experiences to children and people of all ages. On Saturday, July 14, TAKO will host their "**Rockin' Rocks and Fossils**" event at Klein Quarry from 9 am -12:00 noon. CVRMS members volunteer to assist this event. If you wish to help, contact Marv Houg at [m\\_houg@yahoo.com](mailto:m_houg@yahoo.com) or (319)364-2868.

--- see **Rockin' Rocks and Fossils** for more details

## Scientists Pinpoint How Ocean Acidification Weakens Coral Skeletons

The rising acidity of the oceans threatens coral reefs by making it harder for corals to build their skeletons. A new study details how ocean acidification affects coral skeletons, enabling scientists to predict more precisely where corals will be most vulnerable. Corals grow their skeletons upward toward sunlight, thickening and reinforcing them. The new research shows that ocean acidification impedes the thickening process, decreasing the skeletons' density and leaving them more vulnerable to breaking. The research incorporates the nuances of coral skeletal growth, enabling more precise projections of how, where and by how much ocean acidification will affect tropical reef-building corals. The scientists developed a numerical model simulating the skeletal growth mechanism and coupled it with projected changes in ocean acidity. Coral skeletons are made of aragonite, a form of calcium carbonate. Corals grow their skeletons upward by stacking bundles of aragonite crystals on top of each other. They thicken the bundles with additional crystals, strengthening the skeletons and helping them withstand breakage from currents, waves, storms and the boring and biting of worms, mollusks, and parrotfish. Rising levels of



carbon dioxide in the atmosphere, mostly from burning fossil fuels, cause ocean acidification. When carbon dioxide is absorbed by seawater, it's harder for corals to accrete their aragonite skeletons. Reefs face multiple stresses,

including rising sea levels, changing nutrient regimes and warmer ocean temperatures, but unlike ocean warming which causes visible bleaching, the impact of ocean acidification is more difficult to detect and harder to predict. Laboratory experiments and field studies have been ambiguous, showing clear impacts of ocean acidification on skeletal growth in some cases but not in others. The new research suggests this inconsistency reflects the complexity of coral skeleton growth. The researchers examined the coral growth process and showed that the corals can't produce as much aragonite to thicken their skeletons. The corals continue to invest in upward growth, but thickening suffers. As a result, corals build thinner skeletons that are more susceptible to damage from pounding waves or attacks by eroding organisms. The results show that by the start of the next century, declines in coral skeletal density will occur on many coral reefs. The researchers note that other changes, such as ocean warming, will also affect coral growth.

[https://www.nsf.gov/discoveries/disc\\_summ.jsp?cntn\\_id=244292&org=NSF&from=news](https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=244292&org=NSF&from=news)

## A Mineral Blueprint for Finding Burgess Shale-Type Fossils

Scientists have identified a mineral signature for sites that are more likely to contain rare fossils that preserve evidence of soft tissue (essential information to understanding ancient life). Much of what we know about the earliest life on Earth comes from the organic remains of organisms without hard parts. Yet the vast majority of fossils rely on hard tissue such as shells, teeth, and bones for their preservation. Soft tissue parts, such as eyes and internal organs, tend to decay before they can fossilize. This also is true for organisms made up entirely of soft tissue, such as worms. A major exception to this is the Burgess Shale in Canada, a 508 million-year-old deposit that contains a trove of fossils, some with shells but the majority without, from the Cambrian explosion of animal diversity on Earth. The Burgess Shale and similar deposits have provided the basis for a wellspring of scientific research. In a new study published in the journal *Geology*, researchers suggest that the sedimentary rocks that contain these fossils carry a specific signature, which can be used to find other



*Marrella, the most common fossil from the Cambrian Burgess Shale in British Columbia (508 million years old) is a small arthropod (i.e., relative of shrimps, horseshoe crabs) less than 2 cm*

Burgess Shale-type deposits. The researchers examined more than 200 Cambrian rock samples using powder X-ray diffraction analysis to determine their mineralogical composition, comparing rocks containing Burgess Shale-type fossils that include preserved soft-tissues with those that only contained their fossilized shells or skeletons. The findings revealed that Burgess Shale-type deposits are generally found in rocks rich in the mineral **berthierine**, one of the main clay minerals identified by a previous study as being toxic to decay bacteria. "Berthierine is an interesting mineral because it forms in tropical settings when the sediments contain elevated concentrations of iron. This means that Burgess Shale-type fossils are likely confined to rocks that were formed at tropical latitudes and that come from locations or time periods that have enhanced iron." The researchers identified a mineral signature that enabled them to predict with 80% accuracy whether a particular Cambrian sedimentary rock is likely to contain Burgess Shale-type fossils. In addition, the researchers said their findings may have applications beyond our own planet. Mars probes and other space missions looking for evidence of life on other planets could use the mineral blueprint in the search for types of rocks that might be more conducive to preserving delicate, decay-prone fossils. <https://news.yale.edu/2018/02/16/mineral-blueprint-finding-burgess-shale-type-fossils>

# *"Bill's Big Bus Boogie" 2018*

## Milwaukee County Museum



The 2018 incarnation of **"Bill's Big Bus Boogie"** will take CVMRS members on a 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. The club will pay for the bus, for those whose club membership dues are paid up as of May 1, 2018, and they need only pay museum admission. If the bus is not full by September 15, the trip will be opened to the public for \$25/seat. Registration for the trip is **now open**, so contact **Bill Desmarais** at **319-365-0612** or [desmarais\\_3@msn.com](mailto:desmarais_3@msn.com) if you are interested in participating. It should be another great **"Bill's Big Bus Boogie"** field trip!

## 2018 Officers, Directors, and Committee Chairs

|                     |                                                                                                   |              |
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Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:00 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. 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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