



Cedar Valley Gems

Cedar Valley Rocks & Minerals Society
Cedar Rapids, Iowa

[HTTP://WWW.CEDARVALLEYROCKCLUB.ORG/](http://www.cedarvalleyrockclub.org/)

CEDAR VALLEY GEMS

SEPTEMBER 2016

VOL. 42, ISSUE 07

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

**Next CVRMS Meeting
Tues. Sept. 20**

**NEW MEETING LOCATION
"THE OLD BARN"
Indian Creek Nature Center
6665 Otis Rd SE, C.R.**



Indian Creek
Nature Center's
Old Barn

**7:00 pm
featured speaker
Ray Anderson**

"Iowa's Algific Talus Slopes and Ice Caves"

Algific means "cold producing," and "*talus slope*" refers to "a collection of talus or broken rock which rests against a weathering cliff face." These slopes can form on north-facing rock bluffs and cover openings to ice caves (caves which preserve ice for much of the year), usually in karst terrains. In summer, the cooler talus-covered slopes power an air exchange with sinkholes atop the bluff. In the summer warm air enters the sinkhole and passes into the ice cave where it is cooled. It is then vented on the algific slope. In winter, the airflow is reversed. Cool or cold air is drawn through the algific talus into the ice cave, with flowing water or atmospheric humidity being turned to ice. The air temperature on these slopes ranges from "30 degrees F to 55 degrees F spring to fall," and the algific slopes can harbor endangered species of animals and plants. These slopes are very rare, fragile ecosystems and are most famously described in the *Driftless Area* of Minnesota, Wisconsin, Illinois, and especially, Iowa.

Vikings May Have Used "Sunstone" to Navigate

The exploits of the Vikings have been well documented—they conducted raids across Europe from the late 790s till 1066, when the Normans famously conquered England. But as more recent research has established, they were also long-distance seafaring travelers, venturing as far as the Middle East and North America. But how they found their way across vast stretches of ocean has been a bit of a mystery, particularly during times when there were no stars or sun in the sky to guide them. Some historical evidence such as Icelandic legends have mentioned travel under cloudy skies using a "sunstone," and examination of a Viking wreck in 2013 identified a crystal of Icelandic spar (calcite) found near other navigation implements. Not to be confused with the gem sunstone (plagioclase feldspar) this Ice-



Iceland spar, possibly the medieval "sunstone" used by Vikings to locate the sun in a cloudy sky. Inset: image of Haidinger's Brush.

landic spar polarizes the light that passes thru it, causing the light to brighten and dim as the crystal is rotated. Researchers determined that if you look at a cloudy sky through the crystal in a "depolarizing position," and then pull it away suddenly from your line of sight, you can catch a glimpse of a faint, elongate yellowish pattern known as a *Haidinger's Brush*. The ends of that yellow shape point directly toward the sun. This phenomenon is very similar to the specialized ability of many insects, cephalopods, amphibians and other animals to "see" polarization patterns in the sky or water. That's how those animals navigate. Turns out the Vikings may have too. A test of this method identified the sun direction with accuracies of less than 5 degrees.

<http://www.seeker.com/legendary-viking-sunstone-navigation-solved-1765489280.html>

Rockin' Rocks & Fossils TAKO (Take a Kid Outdoors)

TAKO (Take A Kid Outdoors) schedules outdoor events on a monthly basis for kids and parents with an emphasis on free-play and exploration. On August 6 TAKO visited the River Products Co. Riverside Sand Plant and CVRMS members were there to help about 50 kids and parents search for rocks and fossils and assist in identifying the "treasures" they discovered. These included brachiopods, crinoids, bryozoans, ancient granite gravel pebbles, and yes, a couple of small "lakers".



Rock Calendar

2016

Sept. 17-18 - CVRMS Rock and Fossil Auction

Sat. 9 am - 7 pm; Sun. 10 am - 4 pm.
Amana RV Park & Event Center
39 - 38th Ave, Amana

[see Page 10 for more information](#)

Oct. 2 - Sunday At The Quarry Raymond Quarry

[see Page 9 for more information](#)

Oct. 23 - CVRMS Field Trip Field Museum, Chicago

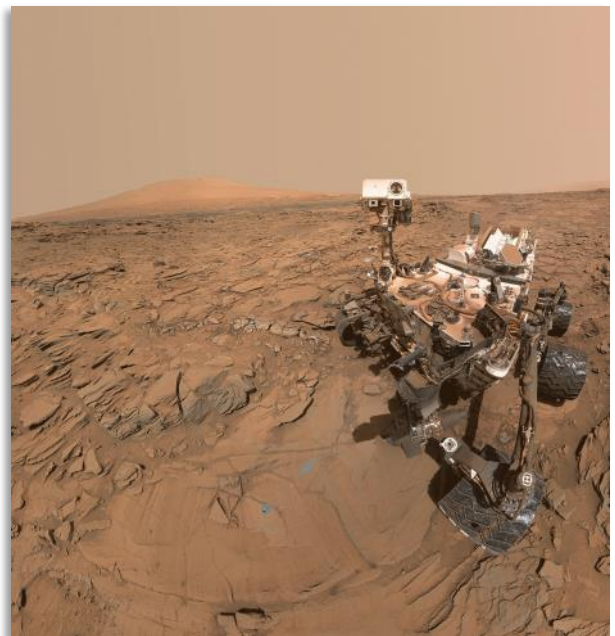
[see Page 3 for more information](#)

2017

March 25-26 - CVRMS Gem, Mineral, and Fossil Show

Curiosity Rover Self Portrait

NASA's rover Curiosity was launched on November 26, 2011, and landed on Mars on August 6, 2012. Since then it has been investigating the Martian landscape and transmitting data and pictures to Earth. Curiosity carries the most advanced payload of scientific gear ever used on Mars' surface. Its assignment: Investigate whether conditions have been favorable for microbial life and discovering clues in the rocks about possible past life. So far it has discovered Martian water, methane, and a meteorite. Since last September Curiosity has been climbing Mount Sharp, a Mount-Rainier-size mountain at the center of the vast Gale Crater and the rover mission's long-term prime destination. On January 19 Curiosity paused at its Okoruso drill site to capture a series of 57 photographs that were combined to produce its self-portrait with Mount Sharp in the background.





The Cedar Valley Rocks and Minerals Society is organizing a field trip by bus to the Field Museum of Natural History in Chicago on October 23, 2016.

The CVRMS will be chartering a bus to carry club members and others to the Field Museum on Sunday October 23, 2016. The Field Museum was constructed for the 1893 World's Columbian Exposition with the help of Marshall Field, the department store pioneer who donated his good name and \$1 million to the project. In the 1920s the Field Museum



of Natural History moved from its South Side home, which years later became the Museum of Science and Industry, to its current home on the lakefront Museum Campus. It has become one of the world's premier natural history museum and one of the largest such museums. It has dropped "Natural History" from its name, but it has stayed dedicated to the field.

>> TRIP NOW OPEN TO NON-MEMBERS—\$25 ea. WHILE SEATS ARE AVAILABLE >>

Sue: In 2000, the Field Museum first displayed , the spectacular 67-million-year-old fossilized *Tyrannosaurus rex* skeleton, the largest and most complete specimen of its kind. Her overall length is 40.5 feet and her skeletal weight is 3,922 pounds. Sue is more than 90%

complete by bulk meaning scientists have recovered more of Sue's bones than any other *T. rex*.

China's First Emperor and His terracotta warriors: For the remainder of this year the Field Museum is offering a special exhibit of China's terracotta soldiers. First Emperor, Qin Shihuang was buried in a palatial tomb, surrounded by all his worldly treasures. To guard his mausoleum, he commissioned an army of terracotta warriors unlike anything seen before or since. The figures vary in height according to their roles, with the tallest being the generals. The exquisitely crafted terracotta figures included about 8,000 soldiers, 130 chariots with 520 horses and 150 cavalry horses.



Grainger Hall of Gems: The Field Museum's newly renovated



Grainger Hall of Gems takes a unique approach to its display of precious stones. For a greater understanding of their relationships, the gems are arranged according to type, from organic gems such as amber, coral, and pearls, to elementals made from one type of atom, such as diamonds. Each display features a gem in its three stages of transformation: as a raw crystal, as a cut and polished stone, and as a jewel mounted in a finished ring, brooch, or necklace. The exhibit includes

a 341-carat aquamarine and a 97.45-carat Imperial Topaz, the rarest type of topaz and the largest owned by any museum in the world!

>> TRIP NOW OPEN TO NON-MEMBERS—\$25 ea. WHILE SEATS ARE AVAILABLE >>

Seats on the bus will be provided at no charge to CVRSM members (in good standing on June 1, 2016), with a modest charge to non-members if seats are available. Individuals will be responsible for their admission charges and other expenses. We will be departing early Sunday morning, spending much of the day at the Museum, then returning in that evening (exact timetable not yet determined). We will be on our feet most of the day, with a lot of walking and stairs, so be prepared. If you are interested **contact Bill Desmarais (desmarais_3@msn.com)** to reserve a seat. Non-members will be placed on a waiting list to for available seats, first come first served.

Field Museum Admission Charges

Basic Admission Charges:

Adults \$22
Children \$15 (ages 3 – 11)
Seniors \$19 (ages 65+)
Students \$19 (w/ valid ID)

Discovery Pass Admission Charges:

(with admission to Terra Cotta Warrior Exhibit)
Adults \$31
Children \$22 (ages 3 – 11)
Seniors \$26 (ages 65+)
Students \$26 (w/ valid ID)

All-Access Pass Admission Charges:

(with admission to Terra Cotta Warrior Exhibit and one 3d movie)
Adults \$38
Children \$26 (ages 3 – 11)
Seniors \$32 (ages 65+)
Students \$32 (w/ valid ID)

CVRMS Board Meeting

CVRMS BOARD MEETING – AUGUST 30, 2016

7:20-9:20 at the home of Marv & Sue Houg

Members Present: Marv Houg, Dell James, Sharon Sonnleitner, Jay Vavra, Bill Desmarais, Dale Stout, Ray Anderson, Bob Roper Meeting called to order by Marv at his residence at 7:15 pm.

Auction-September 17-18 at Amana.

General recap of where we stand on the auction details. Still have about 1200 lots with not much equipment. Lots of discussion about who can drive the truck. Sharon in charge of concessions. Dell will do Friday lunch, Dale Friday pizza.

Programs/field trips

Jay has not had any luck with recent contact with flint knapper.

Chicago Fields Museum. Bill reported that he has 35 people signed up for the Chicago Field trip Oct. 23. The bus can hold 56. Waterloo Club may also have interest. The bill for the bus has been paid to Cedar Valley World Travel, \$2060.00. Participants will have to pay their own entry fee. Non members will be allowed with a \$25.00 charge as seats are available.

Club Awards. Discussion regarding interest in promoting a crinoid as the state fossil. Currently, Iowa does not have a designated state fossil and all in agreement who know about fossils that the Crinoid is the fossil identified with Iowa. Various steps must be taken to generate interest. Ray can get good pictures to use as examples. A packet will be put together to interest the various schools, teachers. A sample letter to bombard the state legislators will be composed and Bill knows a state legislator to help drum up interest. Eventually, other clubs and interested parties will be contacted to help.

Bill discussed the various club awards that are available through the AFMS and Midwest Federation. Need documentation and must take credit for the various activities that the club members participate in. Bill will work on it for next year if feasible for us to do it. More to follow.

Misc. Since the Rockwell Collins cafeteria is still under construction, we do not have a place to meet. Fairfax City Hall now occupies the Guaranty Bank and the community room is already booked by the city for our meeting nights. Various possibilities discussed. VAST center-Bill and Karen can look into that. Nature Center-Bill will check; Legion Hall-Sharon is waiting for call back. Anyone have any ideas or a facility large enough for 30 plus people, let Marv know.

Midwest Federation Show in conjunction with our show in 2019. Short discussion and feel that price for club may be prohibitive. Need more information.

Nominating committee. There is a vacancy on the board since Dave Roush has moved away. Marv appointed Sharon and Ray for nominating committee and will ask potential candidates.

Dell and Sharon will handle snacks for next meeting.

Motion to adjourn by Bill, 2nd Dale. Meeting adjourned 9:10pm.

Respectfully Submitted, Dell James, Secretary

New Way to Measure the Energy of a Lightning Strike

Florida, recognized as the "lightning capital of the United States," is a great place to study the amount of energy released by a lightning strike. University of South Florida School of Geosciences Professor Matthew Pasek and colleagues have developed a unique method to measure the amount of energy expended by a bolt of cloud-to-ground lightning. They were the first to investigate the energy in lightning strikes by studying effects of the strike, cylindrical tubes of glass called a fulgurite. The team collected more than 250 fulgurites, both recent and ancient, from sand mines in Polk County, Florida. The site has a record of thousands of years of lightning strikes, providing a way to measure the lightning strike history of the area. They analyzed the properties of the fulgurites, paying particular attention to the length and circumference of the glass cylinders (which relates to the energy released by a strike). According to Pasek, the energy released by lightning is measured in megajoules (MJ/m). One megajoule is equivalent to the energy used by a 60 watt lightbulb left on for about four hours. The researchers also found a way to separate the "normal" lightning strikes from the "abnormal." According to Pasek,



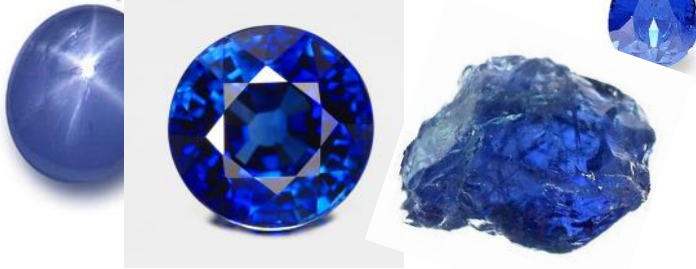
This fulgurite has a diameter of about ½ in.

a bolt of lightning can carry extremely high voltage and heat the air temperature near the strike to more 30,000 degrees Kelvin - (that's over 53,000 degrees Fahrenheit). When lightning strikes sand, soil, rock or clay, the current flows through the target and heats the material to above its vaporizing level. Rapid cooling produces the fulgurite. According to Pasek lightning strikes Earth about 45 times per second, with 75 to 90 percent of the strikes over land masses. "About a quarter of these strikes occur from a cloud to the ground, so the fulgurite-forming potential is great, with up to 10 fulgurites formed per second globally," said Pasek. Their research serves not only to provide a way to measure the immense energy in lightning, but also to help raise awareness of the dangers posed by the bolts.

<https://www.sciencedaily.com/releases/2016/08/160803072824.htm>

Spotlight Gemstone: Sapphire

September's Birth Stone



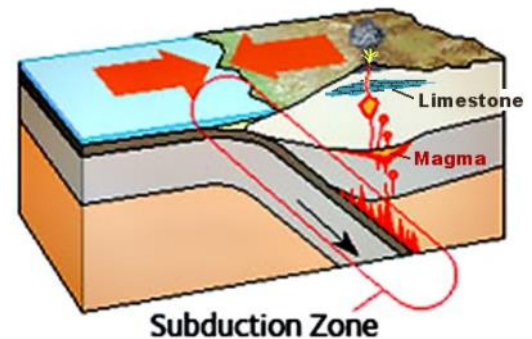
Sapphire, the birthstone for September and the gem of the 5th and 45th anniversaries, is a gemstone variety of the mineral corundum, an aluminium oxide (Al_2O_3) typically containing traces of iron, titanium, chromium, copper, or magnesium. Typically associated with the color blue, sapphires can also naturally occur in a wide variety of colors such as blue, yellow, purple, orange, green colors (which are also called "fancy sapphires"). "Parti sapphires" are those sapphires which show two or more colors in a single stone. The only color which sapphire cannot be is red (red colored corundum is called ruby). Commonly, natural sapphires are cut and polished into gemstones and worn in jewelry. They also may be created synthetically in laboratories for industrial or decorative purposes in large crystal boules. Because of the remarkable hardness of sapphires, 9 on the Mohs scale (the third hardest mineral, after diamond at 10 and moissanite at 9.5), sapphires are also used in some non-ornamental applications, including infrared optical components, wristwatch crystals and movement bearings, and very thin electronic wafers used as insulating substrates in special-purpose solid-state electronics.

The sapphire is one of the three gem-varieties of corundum, the other two being *ruby* (defined as corundum in a shade of red) and *padparadscha* (a pinkish orange variety). Although blue is their most well-known color, sapphires may also be colorless or shades of gray and black. Significant sapphire deposits are found in Eastern Australia, Thailand, Sri Lanka, China (Shandong), Madagascar, East Africa, and in North America in a few locations, mostly in Montana. Blue sapphires are evaluated based upon the purity of their primary hue. Purple, violet, and green are the most common secondary hues found in blue sapphires. Blue sapphires with up to 15% violet or purple are generally said to be of fine quality. Blue sapphires with any amount of green as a secondary hue are not considered to be fine quality. The 423-carat (84.6 g) Logan sapphire in the National Museum of Natural History, in Washington, D.C., is one of the largest faceted gem-quality blue sapphires in existence.

Exploding Limestone !

Researchers from Sweden and Italy have recently shown what happens when magma (molten rock) meets limestone (CaCO_3) on its way up to the surface. Magma-limestone interaction might help explain why volcanoes like Vesuvius in Italy and Merapi in Indonesia are particularly explosive, and it also helps us understand another source of natural carbon released to the atmosphere by volcanoes. They identified particular chemical signatures in volcanic rocks that might signal that CO_2 was released from the upper crust. These new results are exciting

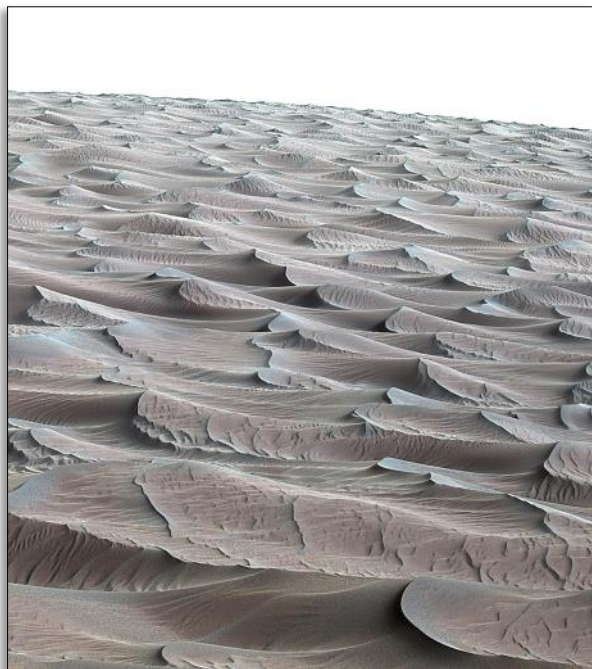
because they may lead to the identification of new pathways for the introduction of carbon into the



atmosphere. Carbon makes its way out of Earth's interior and into the atmosphere mainly by CO_2 emissions with other gasses from volcanoes, especially in subduction zones (where material that was once at Earth's surface is forced downwards into Earth's interior then partly remobilized at depth to feed volcanoes at Earth's surface). During this process, carbon is released from the down-going rocks and enters magma deep in Earth. The magma then rises upwards and releases its carbon load as CO_2 at subduction volcanoes. At least that had been our general understanding of the process. But researchers from Uppsala University, the Swedish Museum of Natural History, and the National Institute for Geophysics and Volcanology in Italy have recently discovered what happens when magma is on its journey upwards through the crust and encounters rocks containing large amounts of CO_2 , such as limestone or marble, only a few kilometers beneath Earth's surface. The scientists replicated this process in the laboratory and found that when magma meets limestone, CO_2 it produces a very bubbly magma. They also discovered that when the CO_2 is released from limestone by decreasing lithospheric pressures at shallow levels in the crust it can trigger extreme behavior. The extra CO_2 might be a factor in driving explosive eruptions at some volcanoes like Vesuvius or Merapi with roots in limestone and marble rocks. Furthermore, this extra source of CO_2 contributes to Earth's carbon cycle, affecting global warming.

<https://www.sciencedaily.com/releases/2016/08/160807183438.htm>

What in the World?



What in the World is so special about these sand dunes ??

June Photo



The June photo shows circular features on a sandstone slab. They are among the world's best known soft-bodied fossils, jellyfish (*scyphozoan*

medusae) preserved in the Late Cambrian (~510 Ma) Mt. Simon and Wonewoc formations at the Krukowski Quarry, located on County Highway C, near Mosinee in central Wisconsin. These beds also contain the trace fossils *Climactichnites* and *Protichnites*, but these medusae fossils are particularly outstanding, with undisputed examples known from only from this locality and St. Johns in New Brunswick, Canada. Scientists think the jellyfish were stranded in the sand, preserved because of a lack of erosion from sea water and wind, scavengers, and any significant sediment disturbance by other organisms.

Opal Discovered in Antarctic Meteorite

A team of planetary scientists, led by Professor Hilary Downes of Birkbeck College London, has discovered opal in a meteorite found in Antarctica. Opal, a familiar precious stone on Earth used in jewelry, is composed of silica (quartz) with up to 30% water in its structure. Before the new work, opal had only once been found in a meteorite, as a handful of tiny crystals in a meteorite from Mars. Downes and her team studied the meteorite, named EET 83309, an object made up of thousands of broken pieces of rocks and minerals, meaning that it originally came from the broken up surface, or regolith, of an asteroid. Results from other teams show that while the meteorite was still part of the asteroid, it was exposed to radiation from the Sun, the so-called solar wind, and from other cosmic sources. Asteroids lack the protection of an atmosphere, so radiation hits their surfaces all the time. EET 83309 has fragments of many other kinds of meteorites embedded in it, indicating many impacts on the surface of the parent asteroid, bringing pieces of rock from elsewhere in the solar system. Downes believes one of these impacts brought water ice to the surface of the asteroid, allowing the opal to form. She comments: "*The pieces of opal we have found are either broken fragments or they are replacing other minerals. Our evidence shows that the opal formed before the meteorite was blasted off from the surface of the parent asteroid and sent into space, eventually to land on Earth in Antarctica. This is more evidence that meteorites and asteroids can carry large amounts of water ice, and they may have brought the water to the Earth and helped it become the world teeming with life that we live in today.*" The team used several techniques to analyze the opal and check its composition. They reported convincing evidence that it is extra-terrestrial in origin, and did not form while the meteorite was sitting in the Antarctic ice.

<https://www.sciencedaily.com/releases/2016/06/160627095939.htm>

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, regardless of if it is chosen.

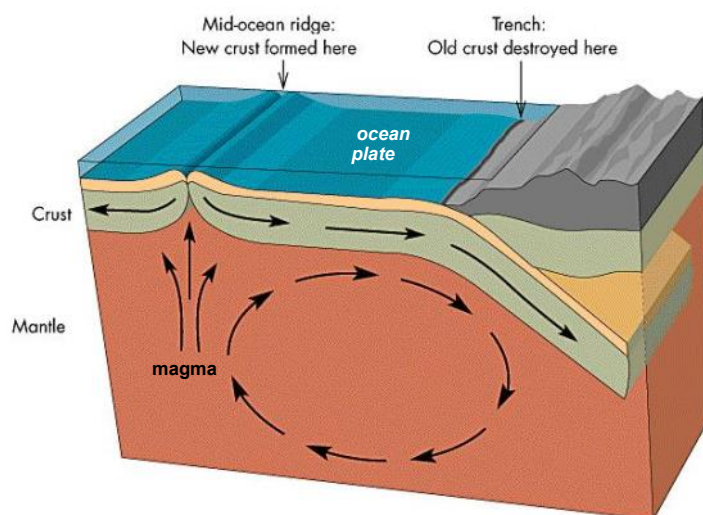
Rona Bradshaw asked: "You keep talking about the ancient oceans covering Iowa and much of North America. Maps that show what areas would flood if all the glaciers melted don't cover Iowa. Where did all of the extra water come from back then and where did it go??"

Rock Doc replied: By studying the rock record, geologists have documented 172 eustatic events (significant rises and lowering of sea level) in just the Paleozoic (530-300 million years ago), and that's only 5.4% of Earth's history. These events varied in magnitude from a less than 50 feet to more than 500 feet. But what caused them? The amount of water on Earth has apparently not changed significantly in the last 3 billion years. The diameter of the Earth is not changing, and the volume of continental crust is only slowly increasing.

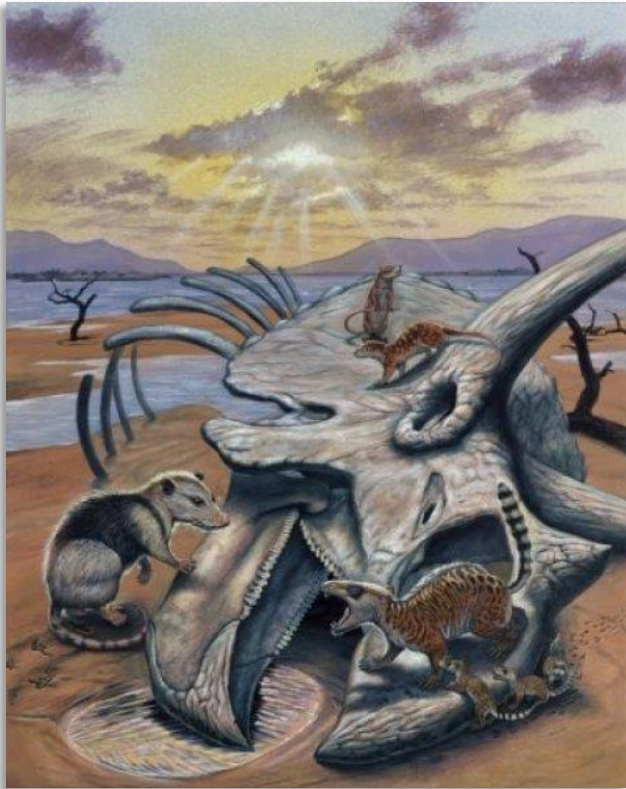
One thing that affects the level of our global seas is the volume of water trapped as ice on land above sea level. It is estimated that if all of the glaciers on Earth melted sea level would rise about 230 feet. But the lowest point in Iowa (near Keokuk) lies about 480 feet above sea level, so that won't flood Iowa. Another factor is the temperature of the water in the sea. An increase of 1°F in sea temperature would raise sea level about 6", but only if the water all the way to the ocean floor was heated. We know that ocean surface temperatures were higher in the geologic past, but probably not the water temperature at depth.

The area of continental crust that is covered by seas is also controlled by the amount of relief on the Earth's continents. If the Earth were a completely smooth sphere, the oceans would cover the entire planet to a depth of about 8,500 feet. So the lower the relief on the continents, the more of them will be covered by oceans.

Another major control of sea level is the volume of the ocean basins. But, what could change the volume of the ocean basins? During the plate tectonic process new ocean floor is formed at the ocean spreading ridges by molten magma moving up from the mantle to replace sea floor that is lost as the ocean plates sink into the mantle at the trench subduction zones. Through geologic time the production of new ocean crust has sped up and slowed down as a result of several processes that are not well understood. An increase in magma production at the mid-ocean ridge spreading zone can increase the size of the mountainous mid-ocean ridge, displacing more ocean water and raising sea level. The increase in spreading speed means that the new ocean crust is thinner and reduces the time that it has to cool. The process of isostasy, then, causes thinner and hotter sea floor to "buoy up", also reducing the volume of the ocean basin and causing sea level to rise. So when geologists identify periods in the geologic past where oceans have covered vast areas of the continents, it is a safe bet that several of these processes have combined to produce the inundation.



Last dinosaur before mass extinction discovered



A team of scientists from Yale University has discovered the youngest dinosaur preserved in the fossil record. The fossil, the horn of a ceratopsian (likely a Triceratops), was collected in the Hell Creek formation in Montana last year. It indicates that dinosaurs did not go extinct prior to the meteor impact that marks the K-T boundary and provides further evidence that the impact was a major contributor to their extinction. The researchers found the fossil buried just five inches below the *K-T* boundary, the geological layer that marks the transition from the Cretaceous period to the Tertiary period at the time of the mass extinction that took place 65 million years ago. This is within the 10 feet of rock below the *K-T* boundary where in-place dinosaur fossils had not previously been documented. The zone has come to be known as the "*three-meter gap*" and has led some paleontologists to argue that the non-avian dinosaurs of the era (which included Tyrannosaurus rex, Triceratops, Torosaurus and the duckbilled) gradually went extinct sometime before the meteor struck. Avian dinosaurs survived the impact, and eventually gave rise to modern-day birds.

Since the meteor impact hypothesis for the demise of the dinosaurs was first proposed more than 30 years ago, many

scientists have come to believe the meteor caused the mass extinction and wiped out the dinosaurs, but a sticking point has been an apparent lack of fossils buried within this gap. "*This discovery suggests the three-meter gap doesn't exist,*" said Yale graduate student Tyler Lyson, director of the Marmarth Research Foundation and lead author of the study, published online July 12 in the journal *Biology Letters*. "*The fact that this specimen was so close to the boundary indicates that at least some dinosaurs were doing fine right up until the impact.*" While the team can't determine the exact age of the dinosaur, evidence suggests that it likely lived tens of thousands to just a few thousand years before the impact. "*This discovery provides some evidence that dinosaurs didn't slowly die out before the meteor struck,*" he said.

The dinosaur fossil was discovered last year by Eric Sargis, curator of vertebrate paleontology at the Yale Peabody Museum of Natural History, and graduate student Stephen Chester while searching for fossilized mammals that evolved after the meteor impact. At first, Lyson said, the team thought it was buried within about three feet of the *K-T* boundary, but were surprised to learn just how close to the boundary (and hence, how close in time to the meteor impact) it was. Because the dinosaur was buried in a mudstone floodplain, the team knew it hadn't been re-deposited from older sediments, which can sometimes happen when fossils are found in riverbeds that may have eroded and re-distributed material over time. The team is now examining other fossil specimens that appear to be buried close to the K-T boundary and expect to find more, Lyson said. He suspects that other fossils discovered in the past may be closer to the boundary than originally thought and that the so-called three-meter gap never existed.

Science Daily <https://www.sciencedaily.com/releases/2011/07/110712211016.htm>

SUNDAY AT THE QUARRY

OCTOBER 2, 2016

11 AM-4PM

BMC'S RAYMOND QUARRY
[EAST OF RAYMOND, IOWA ON OLD
HY20, DUBUQUE RD.]

ROCK, MINERAL, FOSSIL COLLECTING,
QUARRY FIELD TRIPS; PROGRAMS BY THE
GEOLOGICAL SURVEYS, IOWATER, UNI EARTH
SCIENCE DEPT., SOIL AND WATER DISTRICT,
CITY OF WATERLOO, BLACK HAWK GEM AND
MINERAL CLUB, IOWA FLOOD CENTER AND
MUCH MORE!

MORE DISPLAYS AND PROGRAMS THIS YEAR!

Fun, Information, great way to spend an afternoon;
it's FREE and a great experience for all ages.
Individuals, School Groups, Scout Groups, and
Groups of all ages-something for everyone!
A great way to start Earth Science Week!

BMC BASIC
MATERIALS
CORP.

2016 Auction Venue - Amana, Iowa

The CEDAR VALLEY ROCKS & MINERALS SOCIETY Presents

A TWO-DAY ROCK and MINERAL AUCTION

Amana RV Park and Event Center, 39 38th Ave, Amana, Iowa 52203

Saturday, September 17 – 9:00 a.m. - 7 p.m.?

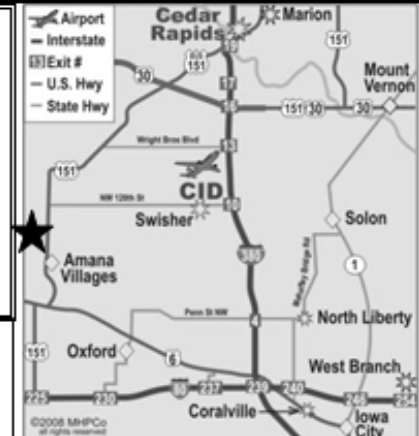
Sunday, September 18 – 10:00 a.m. – 4 p.m.?

Viewing Hours: Fri., Sept. 16, from 5:00 to 7:30 p.m.; Sat. at 7:30 a.m.; Sun at 8:30



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Equipment, Books
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CAMPING AVAILABLE
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**THE FOLLOWING IS A VERY PRELIMINARY LIST OF ITEMS TO BE AUCTIONED
EQUIPMENT WILL SELL AT 2:00 ON SATURDAY**

ROCKS & MINERALS

Agate: Agate Creek Australia, Argentina, Black River, Blue Holly, Brazil (slabs, specimens, stand-up), Bubble Gum, Cold Water, Condor, Graveyard Point Plume, Kentucky, Laguna, Lake Superior, Missouri Lace, Montana Moss, Poppy jasper, Prairie, Puma
Agate Rough: Kentucky, Lake Superior
Agate Slabs
Geodes
Green Avertine, rough
Gold ore, Colorado
Jasper: Noreena, Picasso, Polychrome
Jasper rough
Jade: Wyoming
Fluorite, fluorescent
Keswick specimens
Malachite/Chrysocolla
Mexican Coconuts
Native copper
Obsidian
Ollie specimens

Petrified Wood: Araucarioxylon, Conifer, Palm, Sequoia
Pints quarry specimens, some large
Pyrite
Pyrite Suns Quartz XLS
Red Coral
Ruck's Pit Specimens
Septarian
Silver ore, Colorado
Thompsonite (old, in matrix)
Thundereggs: Bruno Canyon, Demming, Oregon
Turquoise
Youngite (old specimen)

JEWELRY

Belt Buckles (30x40, new)

MISC.

Goniatite/Marble carvings
Spheres: Agate, Petrified wood

FOSSILS

Brittle star
Coral
Crinoid
Fish
Stromatolites
Tampa Bay Coral
Trilobite
Wood (Iowa coal mines)

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

BOOKS

Barlow Collection
Lapidary Books
Metaphysical

I.D. will be required to obtain buying number. Cash or good check. Two forms of I.D. required for all checks.

No items removed until settled for on day of sale. Not responsible for accidents, theft or damage.

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Over the centuries, people have reported seeing animals head for the hills or leave their burrows in the weeks, days or hours before an earthquake hits. But is this belief grounded in science? It's true that animals can sense a quake, usually just minutes before humans do, says Michael Blanpied, associate coordinator of the U.S. Geological Survey (USGS) Earthquake Hazards Program. But that's a reaction to the earthquake, not a special talent for predicting when or where a quake might hit. Researchers have theorized that certain animals can detect signals that humans cannot, such as subtle tilting of the ground, changes in groundwater or variations to electrical or magnetic fields.

Seismologists would love to have an earthquake early-warning system; sadly, animals don't appear to be the answer, says Blanpied. "The most likely time to have a big earthquake is after a small quake," he says. But even knowing



that little quakes beget big ones isn't much help. One quake doesn't give scientists the ability to know exactly how long until the next one, or even where it will have its epicenter. Tracking quakes is no easy feat given that the Earth experiences millions a year, many of which are barely noticeable.

Humans have a longstanding attachment to the belief that animals know a quake is on the way. Throughout history, starting in ancient Greece, animals have reportedly been observed fleeing an area that subsequently had an earthquake. These observations, however, were recollections after the quake. It's hard to document that animal behavior changed before an earthquake.

Jim Berkland is a San Francisco Bay Area geologist who accurately

predicted Northern California's 1989 Loma Prieta earthquake. His forecast relied, in part, on combing the classified ads for local newspapers, which he said demonstrated that a larger than usual number of household pets were listed as missing in the week or so before the 6.9 magnitude quake. The USGS does not outright dismiss the possibility of animal activity as a predictor, says Blanpied. On its website, the agency points to a 2000 study by seismologist Joseph L. Kirschvink, which suggested that animals' instinctual fight or flight response may have evolved over the millennia to also be a sort of early warning system for seismic events. Many who believe animals can sense quakes point to work done by the late Friedemann T. Freund, who postulated for decades that rapid stresses in the earth's crust just before a quake cause major changes in magnetic fields, which animals can sense. Blanpied says these theories "have been roundly questioned and criticized," because rapid stress changes would not be expected before a quake, and because such changes were never observed or recorded outside of Freund's lab. Undaunted, in 2015 Freund and others published a study showing that animals in Peru's Yanachaga National Park "basically disappeared" in the weeks leading up to a 7.0 magnitude quake in the region in 2011. Animals are able to detect the first of an earthquake's seismic waves—the P-wave, or pressure wave, that arrives in advance of the S-wave, or secondary, shaking wave. This likely explains why animals have been seen snapping to attention, acting confused or running right before the ground starts to shake, Blanpied says. Also, some animals—like elephants—can perceive low-frequency sound waves and vibrations from foreshocks that humans can't detect at all. Just ahead of the 5.8 magnitude quake that hit the Washington, D.C. area in 2011, some of the animals at the Smithsonian Institution's National Zoo raised a ruckus, says Kenton Kerns, a small mammal biologist at the Zoo. Among those were the lemurs, who began "calling"—loudly vocalizing—about 15 minutes before keepers felt the ground shaking. Keepers recalled the activity after the quake took place. Why do humans cling to the idea that animals are prognosticators? "I think people feel comforted by the idea that there would be something that would make earthquakes predictable," says Blanpied.

<http://www.smithsonianmag.com/smithsonian-institution/ask-smithsonian-can-animals-predict-earthquakes-180960079/>

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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 Rockwell Collins 35th Street Plant Cafeteria, 855 35th St NE, Cedar Rapids, Iowa. The December meeting is a Christmas dinner held on the usual meeting night. 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:

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cedarvalleyrockclub.org

Next Meeting:
SEPTEMBER 20
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"Iowa's Alight Talus Slopes and Ice Caves"
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