

Cedar Valley Gems



Cedar Valley Rocks & Minerals Society
Cedar Rapids, Iowa

CEDAR VALLEY GEMS

MAY 2017

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**Next CVRMS Meeting
Tues. May 16**

**SPECIAL MEETING
Indian Creek Nature Center**

**“Weather Forecasting: From Weather Lore
to Supercomputers”**

by Craig Johnson

"Red sky at night, sailors' delight. Red sky in the morning, sailors take warning;" to supercomputers making 213 trillion calculations per second, weather forecasting isn't what it used to be. Craig Johnson covers what goes into a weather forecast, beginning with its foundations and leading up to the computer's ultimate problem - acquiring more data and more speed. What is it that makes a perfect weather forecast so elusive? Learn about the science and the people seeking solutions.



After 24 years in the profession, Craig Johnson retired as Chief Meteorologist for KWWL television to become the Executive Director of the Iowa Academy of Science in 2004. For this special presentation, the CVRMS will hold its May meeting in the Elizabeth M. Allsop auditorium at the Indian Creek Nature Center in Cedar Rapids. The meeting will begin at 7:00 pm.



The receipts are in and all of the bills paid for the **2017 CVRMS Rocks, Fossils, and Minerals Show**, and it was indeed the **BEST ROCK SHOW EVER!!**



A total of 4,425 costumers (2760 adults and 1665 children) led to Gate receipts of a **record** \$9,700; the Silent Auction totaled almost \$1,250 (a **new record**— way to go AJ); the Pebble Pit also set a **new record** of almost \$1100; and we received a record income from dealers of almost \$10,000. So that gives us total Receipts of a **record** \$22,725!! Expenses were also a **record high** total of \$10,550, but even so the CVRMS was able to make a **record** Profit of \$12,168. As is our tradition, the CVRMS Board of Directors voted to donate approximately 90% of the Show profits to Scholarships and VAST (the Grant Wood AEA [Van Allen Science Teaching Center](#)). Scholarships will be increased \$500 each (The University of Iowa-\$4000, Cornell-\$3000) and VAST will remain at \$1500, but the profitability of the show will allow us to donate an **extra** \$1000 to the UI and \$500 each to Cornell and VAST (for a grand total of \$10,500 donated). Congratulations to everyone who assisted in the success of this year's show.

WAY TO GO, FOLKS !

CVRMS Board Meeting

Board Minutes – April, 2017

Members present: Pres. Marv Houg, Dale Stout, Joy Cummings, Jay Vavra, Sharon Sonnleitner, Dell James, Bill Desmarais

Call to order at 7:15pm by Marv Houg at his house.

Show report: Review of income and expenses. Show was a financial success. This led to a review of the club's educational disbursements.

Scholarships: Motion made by Joy to increase our current scholarships by \$500 each and keeping VAST at current amount. 2nd by Bill. Discussion followed. Jay proposed disbursements be based on a percentage of our show profits. After much deliberation and discussion, it was decided to figure a total award equal to approximately 90% of the show profits. The first motion by Joy was approved. Base amounts to University of Iowa \$4000, Cornell \$3000, VAST \$1500.

Motion made by Jay. Approximately 90% of Show profits will be donated to scholarships and VAST. Base amounts will go to The University of Iowa-\$4000, Cornell-\$3000, VAST-\$1500 as the annual scholarship donations, with the excess money being divided 50%, 25% and 25% among the three respectively. Sharon 2nd. This will result in extra \$1000 to the UI and \$500 each to Cornell and VAST for a grand total of \$10,500 which is approximately 90% of Show earnings. Dale suggested separate checks so the schools will realize the percentage amount may change each year. Approved.

Recommendations will be brought to membership for approval.

Discussion about the possibility of closing the show earlier on Sunday. Is there enough traffic to warrant staying until 5:00 pm? Marv will ask various vendors and check other show times.

Jay suggested that we acknowledge those dealers who have been with our show for 10 years or more, certificate or something to display in their booth. Dale and Sharon will check if they can track down a history of repeat dealers.

Bone dig - no bones left so what can we do instead? Sharon suggested modern arrowheads or shark teeth. Marv will look into prices of various possibilities.

Auction: Marv reported that he has about 1,150 items. Sharon will send out contracts. We have a Moroccan fossil which was donated to the club. Proceeds will go to University of Iowa Scholarship in addition to our usual scholarship.

May meeting: May 16 meeting will feature special guest Craig Johnson, weatherman, and will be held at the Indian Creek Nature Center. Bill will have registration open for October 21st bus trip at that meeting.

Picnics: Reservations have been made for all parks, Ellis, Squaw Creek, Morgan Creek.

Field trip: May 7 to Klein Quarry. Dale will post info.

Adjournment: Motion to adjourn by Joy, 2nd by Bill. Meeting adjourned 9:15pm.

Respectively submitted,
Dell James, Secretary

CVRMS Jan. 17 Meeting

Regular Minutes – April 18, 2017, at Fairfax Public Library

Called to order by President Marv Houg at 7:05

Guests: Gail & Ed Kettenbrink and Carl Fors

Secretary's Report: Motion was made by Julie Whitlatch to approve the secretary's report as published. 2nd by Bill Desmarais. Carried.

Treasurer Dale Stout reported a balance of \$33,024.44 in checking. Motion was made by AJ Johnson to accept the report. 2nd by Tom Whitlatch. Carried. Dale also passed out a show report showing attendance at 4,425 and profit close to \$12,000. The report is not yet final.

Show: Tom made a motion to have a show in 2018. 2nd by Lisa Blunt. Carried. Tom made a motion to host the AFMS meeting in 2019 and submit a proposal to the Federation in May. 2nd by Bill. Carried. Dates are March 23-24, 2019.

Auction: Marv reported there are 1,130-1,150 lots for the September 16-17 auction.

Field Trips: Bill reported he has set up a bus for a field trip to Augustana's Fryxell Museum in Davenport, followed by the Lizzadro Museum of Lapidary Arts in Elmhurst, Illinois, on Saturday, October 21. Costs are free and \$5 respectively. The bus will cost \$2,100, which the club will pay. Tom made a motion to schedule the bus trip and make a down payment. 2nd by Lisa. Carried.

Marv announced a field trip to a yet-to-be-determined Iowa City Quarry on May 7. Hard hat, safety vest and hard-toed shoes required; goggles recommended; long pants required. Suggested tools are bucket, rock hammer, chisel and water.

MSHA training has been rescheduled for Saturday, May 27, 2:00 only, Marion Library. Cost is \$10. Register with Marv.

May 16 Meeting will be at the Indian Creek Nature Center. Craig Johnson, Director of the Iowa Academy of Science and former TV weatherman, will give the program.

Correspondence: The Geological Society of Iowa will hold a field trip to Waterloo South on April 12. Tom read an old letter from the MWF auction committee thanking the club for its donation.

New Business: Tom made a motion to renew our American Lands Access Association (ALAA) membership of \$50. 2nd by Sherri Mealhouse. Carried.

AJ made a motion to donate \$100 to Connections, the local group that brings in nationally known speakers on various nature topics. 2nd by Bill. Carried.

Julie volunteered to be the club delegate at the MWF annual meeting. Sherri made a motion to pay expenses of \$100. 2nd by Melanie Paul. Carried

Julie made a motion to reimburse the gold panners \$100 for the vials of painted shot they have given out at the Show over the past three years. 2nd by Bill. Carried.

Adjournment: AJ made a motion to adjourn. 2nd by Tom. Adjourned at 8:00.

The program followed adjournment: PBS Nova series video, titled "The Four-Winged Dinosaur."

Respectfully submitted,
Sharon Sonnleitner, Acting Secretary



An asteroid hit this region 15 million years ago leaving behind rock that's made up of glass, diamonds, crystals and other debris.

The town was built in the depression left from the asteroid.

You can't necessarily see the massive number of diamonds in the Bavarian town of Nördlingen. But trust the scientists: there are 72,000 tons of microscopic diamonds dusting the buildings in the area. They weren't put there on purpose, either. We can thank a wayward little asteroid for this incredibly strange phenomenon. Said asteroid hit this region of Bavaria 15 million years ago, leaving behind the nine-mile diameter Ries crater (at the very site of which you'll find Nördlingen). The asteroid also left suevite — rock that's made up of glass, diamonds, crystal, and other debris — in its wake. According to a study on the distribution of these impact diamonds in Germany, the gemstones were formed because of the velocity of the collision between the asteroid and the Earth. In an interview with *The Smithsonian*, geologist and deputy director of the **Ries Crater Museum** Gisela Pösges shared some theories on the asteroid that unintentionally decorated this lavish little town: "We assume that the asteroid was a stony one with a weight of [approximately] three billion tons." Until the 1960s, many believed that the massive depression in which the town was built was actually a volcanic crater. Geologist Eugene Shoemaker eventually made the asteroid connection. But it took 10 more years before they realized that there were diamonds in the asteroid debris. Now, the town has various asteroid specimens and diamonds on display. But this isn't the only town made of diamonds: You can also find suevite buildings in Berlin and Munich, according to *The Smithsonian*.

http://www.businessinsider.com/this-german-town-is-covered-in-72000-tons-of-diamonds-2017-3?utm_content=buffer643b0&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer-ti



May's birthstone, the emerald, is one of the most regal of all, 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. In contrast, "Cleopatra's Mines" in Egypt had already been exhausted by the ancient Egyptians, so that when they were rediscovered in the 19th century, there was simply nothing left! These are only a few of the cultures which treasured this gemstone. In Roman times, emerald was associated with Venus, goddess of beauty and love. Its pigment was so venerated that Pliny remarked that green "gladdened the eye without tiring it!" It is also valued in the Catholic Church, green being considered the most elemental and natural of the colors used in their worship. The Vedas, Hinduism's oldest scriptures, acknowledge the healing powers of emeralds, promoting well-being as well as good fortune. Emeralds are also highly prized in Islam - green was the Prophet Muhammed's favorite color, and all dwellers of paradise are said to be dressed in green. In the 1960s, the Amer-



The world's largest uncut emerald

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

What in the World?

April Photo



Where in the World was This Photo Taken??

... and what are we looking at ??



Last month's **What in the World** photo shows an exposure of a spectacular submarine landslide deposit on the Boso Peninsula, Japan. Megabreccias of the Hata Formation of the Plio-Pleistocene Chakura Group were produced by earthquakes along thrust faults in an accretionary prism, then finally pushed onto land by the thrusting, powered by the subduction of the Pacific Plate beneath Japan. Outcrops usually are too small or not well enough exposed to view these types of features, but these rocks, exposed by road building, are definitely good ones. Such landslides on the seafloor can cause massive reorganization of the seafloor and can generate tsunamis.

Rock Calendar 2017 CVRMS Events of Interest

May 6-7 - Midwest Federation Convention

Crow Wing County Fair Grounds
Brainard, Minnesota
<http://www.amfed.org/mwf/convention/convention.html>

May 7 - CVRMS Field Trip to Klein Quarry

Meet 8:45 at main entrance
Klein Quarry, Coralville, IA

May 16 - CVRMS Monthly Meeting

Indian Creek Nature Center
5300 Otis Rd
Cedar Rapids
(see page 1 of this Newsletter)

**May 30 - Sac & Fox Lapidary Club
Rock Swap**

200 N. Main St.
Fairfield, Iowa

June 20 - CVRMS Monthly Meeting

Picnic at Ellis Park Overlook
"rock cutting and polishing"

July 18 - CVRMS Monthly Meeting

Picnic at Squaw Creek Meadowlark Pavilion
"geode cracking"

Aug 15 - CVRMS Monthly Meeting

Picnic at Morgan Creek
"bingo"

Sept. 16-17—CVRMS Rock Auction

Amana RV Park and Event Center
Amana, Iowa

**Oct. 21-22 - Des Moines Lapidary
Society Show**

3000 E Grand Ave
Des Moines, Iowa

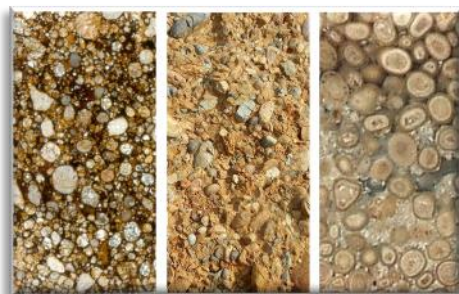
Ask a Geologist

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 asked me "how do you tell if a rock is a meteorite or an Earth rock?"

Rock Doc replied: "That's not always easy. They can be very similar because some were formed in much the same way. The Earth and the asteroid planetoids formed at about the same time by the clumping together of dust in a disc orbiting the Sun. These dust clumps formed small spherules which, in turn, clumped together to form larger masses (smaller planetoids and larger planets). The decay of radioactive elements in the planetoids and planets produced heat that melted the larger of these bodies, and the heavier elements (iron, nickel, etc.) sank to the center to form cores. Smaller bodies were heated to lesser degrees, but did not melt. These bodies remain a mass of clumped dust spherules and are called **chondrites**, and are by far the most common meteorites found on earth. They may be confused with Earth rocks such as sandstones or oolites, but can usually be identified by visual inspection (see pictures below). Chondrites constitute about 86% of all meteorites that land on Earth, although most break



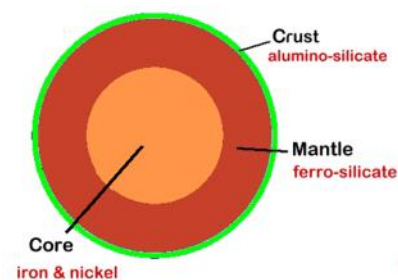
chondrite sandstone oolite

up in the atmosphere. Bodies that do differentiate (including Earth) form cores dominated by elemental iron, nickel, and other heavy minerals and mantles of iron silicate minerals, generally 75 – 90% silicon-based minerals and 10 – 25% nickel-iron alloys. On Earth the outer core has remained molten and its heat has kept the mantle in a plastic state driving plate tectonics which, along with the atmosphere, produced a thin crust. The smaller differentiated planetoid asteroids cooled and solidified completely. Occasionally these asteroids collided with one another with enough energy to shatter them, producing pieces of iron-nickel core and ferro-silicate mantle, which some sent crashing into Earth as iron and stony meteorites.

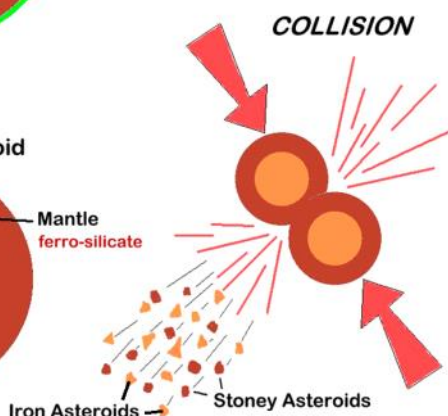
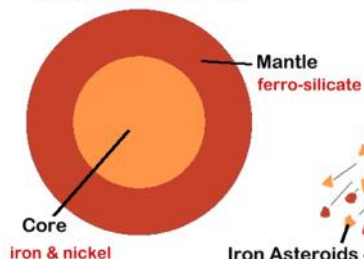
The **iron meteorites** are also relatively easy to identify, because they are dominant crystalline nickel-iron. If cut, polished and acid etched, most will display the crystal boundaries (known as Widmanstaaten lines). They are strongly magnetic and most include only nickel-iron. These iron asteroids constitute only about 6% of all meteorites that reach Earth. The stony asteroids can be much harder to identify. Known as **achondrites**, most are fairly magnetic, but they can be very difficult to differentiate from Earth rocks. Fortunately they are fairly rare (only about 7% of meteorites on Earth). Most achondrites are destroyed by the Earth's atmosphere. Most will be magnetic and will not include quartz and other minerals

common to Earth rocks. Then there are those interesting meteorites that are mixtures of several types of asteroids that combined by crashing together. These **mesosiderites** can mimic Earth rocks, but there is usually something identifiable in them. Some (**pallestites**) have olivine crystals in an iron matrix. Only about 1.5% of meteorites on Earth are mesosiderites. Then there are also meteorites from the Moon and Mars. They are exceedingly rare on Earth. So when I look at a rock that is a potential meteorite, the first thing I do is to look at its composition and determine if it is a rock that could only have formed on Earth (does it have oxide minerals, quartz, carbonate, etc.), in other words is it a rock I recognize. Then I check to see if it attracts a magnet (most meteorites do, but not all, and many Earth rocks are also magnetic). If I am still not sure if the rock is a meteorite or not, I take it in to the Iowa Earth and Environmental Sciences Department where Professor David Peate is usually able to find time to zap it in his Mass Spectrometer and determine exactly what it's made of.

Structure of the Earth



Differentiated Asteroid Planetoid



Huge pink diamond auctioned for record \$71.2 million

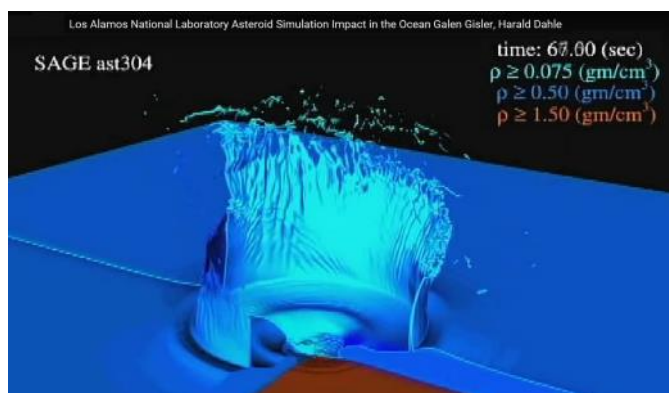


A stunning 59.6 carat diamond known as the "Pink Star" sold for \$71.2 million at a Sotheby's auction on March 28 in Hong Kong, setting a new world record for any diamond or jewel, according to the auction house. The oval mixed-cut diamond smashed the \$60 million pre-sale estimate set by Sotheby's when it went on the block. The sale comes three years after the gem was sold at an even higher price at another Sotheby's auction in Geneva. That deal later fell apart after the buyer defaulted. The gem is the largest flawless fancy vivid pink diamond ever graded by the Gemological Institute of America. It was sold for a hammer price of \$63.0 million, not including the buyer's premium. Sotheby's says the buyer was Hong Kong jewelry company Chow Tai Fook, which beat out two other telephone bidders. Until now, the most expensive diamond ever sold at auction was the "Oppenheimer Blue," which fetched \$57.6 million last May. The previous world auction record for a pink diamond was \$46.2 million for the 24.78 carat "Graff Pink" in 2010. Sotheby's decided the time was right to bring the diamond back to the market because of rising demand from wealthy Asian buyers. "The Asian element in the jewelry market is extremely important, and from what I've been hearing from members of the trade I've been talking to, in the last six months they have become more and more important," said David Bennett, chairman of the auction house's jewelry division. The "Pink Star" was mined in Africa by De Beers in 1999 as a raw 132.5 carat gem and cut over a two-year period. In November 2013 it was auctioned for a record \$83 million to New York diamond cutter Isaac Wolf. However, Sotheby's revealed months later in its 2014 earnings report that Wolf defaulted on the transaction. The auction house was forced to buy the diamond from the seller because it had guaranteed a \$60 million sale price.

http://www.businessinsider.com/ap-pink-diamond-auctioned-for-record-712m-in-hong-kong-2017-4?utm_content=buffer5421c&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer-ti

Scientists simulate an asteroid impact in the ocean, and it's not good

If you've ever had a nightmare about an asteroid or other large extraterrestrial object crashing into the Earth, you probably imagined it hitting solid ground. That could very well happen, but considering how much of our planet is covered by oceans, you'd be better off planning for an aquatic impact instead. Researchers at the Los Alamos National Laboratory prepared a visualization of just such a scenario, and it's both reassuring and horrifying.



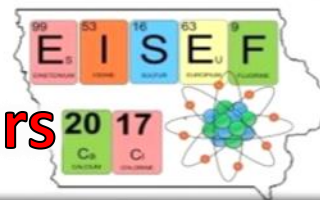
For starters, if the asteroid were to strike the ocean within about 12 miles of a coastline, it would likely wipe out a good chunk of whatever happens to be residing on the nearby land. That would be a pretty big bummer, but the good news is that if the rock hit the water way out in the middle, we don't actually have to fear a giant mega-tsunami like you might imagine. Using the ridiculously powerful computers and software at their disposal, the scientists simulated the potential consequences of a variety of asteroids striking the ocean, as well as whether or not the rock exploded above sea level before impact. What they found was that the way the asteroid's kinetic energy is transferred to the water can vary greatly depending on conditions, but a tsunami created by such an impact isn't likely to obliterate the coastlines the way a much closer impact would. That's good news, but there's still some pretty serious consequences to a mid-ocean asteroid splash, namely the vaporization of the water being struck. The asteroid has the potential to send hundreds of megatons of water into the atmosphere. That may not sound like a big deal, but if the water vapor reaches the stratosphere, it can stay there for years. Such an event would produce a greenhouse effect that could dramatically alter the climate. In short, there's really no "good" scenario when it comes to an asteroid hitting the Earth, but if one ever does swing by and make a splash, just cross your fingers that it's small.

<http://bgr.com/2016/12/14/asteroid-hitting-earth-simulation/>

Another video model of an asteroid impact in water:

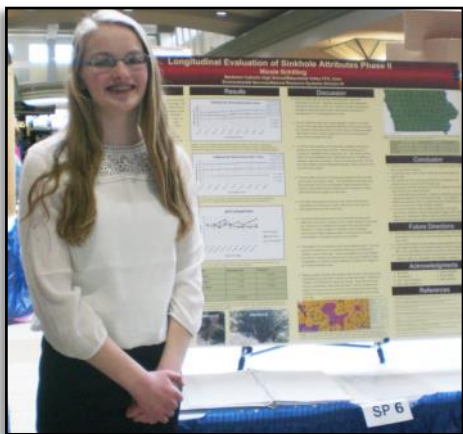
<https://www.youtube.com/watch?v=imZmoxex9hc>

2017 Eastern Iowa Science & Engineering Fair Award Winners

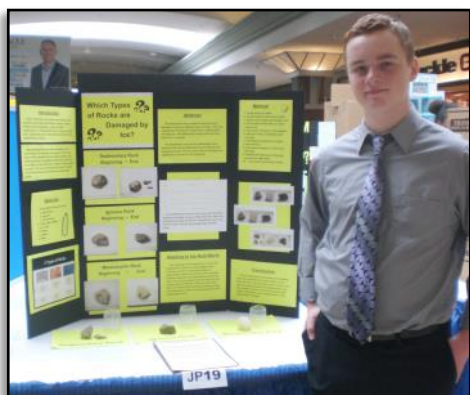


The Cedar Valley Rocks and Minerals Society continued its support of area science education by participating as a prize and donor sponsor of the 2017 Eastern Iowa Science & Engineering Fair held at Lindale Plaza in Cedar Rapids on March 18. Bill Sonnleitner served as the Judge and identified the winners of the CVRMS awards for Geoscience-Related projects.

Cash awards, along with certificates of accomplishment, were presented to the following participants on behalf of the Society:



Nicole Schilling from Beckman Catholic HS (under the supervision of Cheryl Kluesner) received \$50.00 and a first-place Senior Physical certificate for her entry *“Longitudinal Evaluation of Sinkhole Attribute Phase II.”* Nicole continued her last year’s studies of the factors effecting limestone sinkhole expansion with special attention to the ph levels of rain runoff into the sinkholes. She studied two nearby sinkholes, one in the middle of an alfalfa field and another in the middle of a pasture. Both sinkholes were among numerous limestone sinkholes occurring near her hometown of Dyersville in North-eastern Iowa (Silurian bedrock). Although her results were inconclusive, she detailed plans to further refine her studies of these intriguing sinkholes.



Gavin Cutler from Riverbend MS (under the supervision of Karen Koenig) was awarded \$50.00 and a first-place Junior Physical certificate for his entry *“Which Types of Rocks are Damaged by Ice?”* Gavin subjected samples of sedimentary, metamorphic, and igneous rocks to daily freezing and thawing (inside of half bottles initially filled with water) over a period of two months while recording the results every third day. As hypothesized, by the end of his experiment the sedimentary rock showed a good amount of fracturing and splitting while the metamorphic and igneous rocks remained unchanged.



Keiko Radley and Isabel Jurgens from South East JHS (under the supervision of Bennett Brown) together were awarded \$30.00 and a second-place Junior Teams certificate for their entry *“Studying the Effects of Acid on Rocks.”* They studied the effects of diluted hydrochloric acid on the density of a selection of rocks they had found over the years. One resembled pyrite, one quartz, one was fossilized limestone, and another was a piece of granite with some gray spots (obtained during a trip to the Black Hills, SD). Density was measured by comparing weight with water volume displaced. Only the density of the fossilized limestone showed any observable density change.

In addition to these cash prizes, the Society donated \$40.00 for general use by the **Eastern Iowa Science & Engineering Fair** organization.

What's New In Iowa Geology ??

"Scorpy" the Eurypterid Embarks on a Year-Long Bus Tour of Iowa



Iowa Geological Survey geologists Paul Liu and Jason Vogelgesang view "Scorpy" on display in the University of Iowa Mobile Museum.

This year, visitors to the University of Iowa's Mobile Museum will get a glimpse of Iowa history that might look like something from a horror movie — a six-foot giant sea scorpion (nicknamed "Scorpy") that called Iowa home hundreds of millions of years ago. Iowa Geological Survey research specialist Paul Liu and his team discovered that 465 million years ago, a meteorite had struck the Earth in the area that is now Decatur, Iowa. In the resulting crater, the researchers found an astonishing collection of exceptionally well-preserved fossils. The site represents one of only a few such "Lagerstätten" (the scientific term for a fossil deposit of this magnitude) from the Middle Ordovician period. Liu explains that at that time, shallow saltwater covered much of what is now the Midwest. The meteorite struck very near the coast line, so the partially isolated sea water that filled the crater depression became brackish and low in oxygen. Distinctive organisms evolved to exist in the special conditions there.

When they died and fell to the seabed, they were preserved and laid undisturbed until Liu and his colleagues discovered them. "This opens a new window to tell us what Ordovician life was like," Liu says. Among the most dramatic finds were the carbonized carapaces of numerous eurypterids (sea scorpion), the earliest and largest such animal of that period, with a long head shield, a narrow curving body, and huge scary claw-like limbs that could easily trap the creature's unfortunate prey. The sea scorpion's modern relatives include spiders, lobsters, and ticks. Imagine a six-foot tick! Working with colleagues at Yale University, Liu has been able to form a picture of how this predator looked and what its life was like in the shallow and likely brackish waters that covered Northeast Iowa millions of years ago. The life-size model Eurypterid was created by TV's National Geographic Channel and was featured in "[The Day the Sky Fell](#)," an episode of "[Strange Truth](#)" series that aired on January 21, 2016.

The University of Iowa Mobile Museum was launched in 2014 as a partnership between the Office of the Vice President for Research and Economic Development, the Office of the State Archaeologist, and the Pentacrest Museums. The Mobile Museum inspires visitors to understand the world by bringing exhibits with cutting-edge research, one-of-a-kind artifacts, and interactive digital media to Iowa's communities statewide. The UI Mobile Museum crisscrosses the state of Iowa, stopping at schools, libraries, fairs, and more. Be sure to check it out when the Mobile Museum is in your town! To learn more, visit: <https://discover.research.uiowa.edu/mobile-museum>



<https://www.iuhr.uiowa.edu/igs/delving-deep-scientific-discoveries-from-iowas-ancient-sea/>

New 507-Million-Year-Old Sea Creature With Can Opener-Like Pincers

Paleontologists at the University of Toronto and the Royal Ontario Museum have uncovered a new fossil species that sheds light on the origin of mandibulates, the most abundant and diverse group of organisms on Earth, including familiar animals such as flies, ants, crayfish and centipedes. The finding was announced in a study published last month in *Nature*. The creature, named *Tokummia katalepsis* by the researchers, is a new and exceptionally well-preserved fossilized arthropod - a ubiquitous group of invertebrate animals with segmented limbs and hardened exoskeletons. *Tokummia* documents for the first time in detail the anatomy of early mandibulates, a hyperdiverse sub-group of arthropods which possess a pair of specialized appendages known as mandibles, used to grasp, crush and cut their food. *Tokummia* lived in a tropical sea teeming with life and was among the largest Cambrian predators, exceeding 10 cm in length fully extended. An occasional swimmer, the researchers conclude its robust anterior legs made it a preferred bottom-dweller, as lobsters today. Speci-



Dorso-ventrally preserved specimen showing a pair of large pincers (maxillipeds) at the front preserved almost symmetrically.



A life reconstruction of *Tokummia katalepsis* showing a pair of large pincers at the front for capturing prey, with much of the multisegmented body protected by a broad carapace.

mens come from 507-million-year-old sedimentary rocks near Marble Canyon in Kootenay national park, British Columbia. Analysis of several fossil specimens, following careful mechanical preparation and photographic work, showed that *Tokummia* sported broad serrated mandibles as well as large but specialized anterior claws, called maxillipeds, which are typical features of modern mandibulates. The body of *Tokummia* is made of more than 50 small segments covered by a broad two-piece shell-like structure called a bivalved carapace. Importantly, the animal bears subdivided limb bases with tiny projections called endites, which can be found in the larvae of certain crustaceans and are now thought to have been critical innovations for the evolution of the various legs of mandibulates, and even for the mandibles themselves.

<https://phys.org/news/2017-04-paleontologists-million-year-old-sea-creature-opener-like.html>

Headless Dinosaur Reunited With Its Skull One Century Later

After being headless for almost a century, a dinosaur skeleton that was uncovered in 1992 and had become a tourist attraction in Dinosaur Provincial Park was finally reconnected to its head. In the early 2010s, a group of scientists exploring the site of the 1992 excavation noticed plaster and newspaper clippings dating back to the 1920s in the debris around the excavation. With a



Corythosaurus skull collected by George Sternberg in the 1920s and curated at the University of Alberta

little historical detective work, a team of researchers, including friend of the CVRMS Dr. Phil Currie, learned that paleontologist George Sternberg had collected a single hadrosaur specimen, a skull without a lower jaw, in that area in 1920. Further they discovered that Currie had recovered a lower jaw and toe bone from the site in 1992. Using anatomical measurements of the skull and the skeleton, they conducted a statistical analysis to match the headless skeleton to the *Corythosaurus* skull collected in 1920 by Sternberg and the jawbone collected by Currie. The skull was on display at the University of Alberta in Edmonton, while the jaw and toe bone are at the Royal Tyrrell Museum, and the rest of the unexcavated skeleton at Dinosaur Provincial Park. In 2012, the remainder of the *Corythosaurus* skeleton was excavated, mounted, and reunited with the skull and lower jaw. Whole once more, the specimen resides at the University of Alberta. This discovery highlights a growing field of study in paleontology, with researchers now trying to develop new ways of determining whether or not disparate parts of skeletons come from the same animal. The project was published in April 2017 *Cretaceous Research*.

<https://phys.org/news/2017-04-headless-dinosaur-reunited-skull-century.html>



"K2 Granite," also known as "K2 Jasper" or "raindrop azurite," is an extremely interesting rock and lapidary material from the Skardu area of northern Pakistan. It is like an eye magnet for anyone who sees it for the first time. It is a bright white granite that contains sharply contrasting orbs of bright blue azurite. The azurite orbs range from a few millimeters up to about two centimeters in diameter. On a broken surface or on the surface of a slab, the blue orbs look like drops of bright blue ink that splashed onto the rock. Upon closer examination, however, you will see that they are actually spherical in shape. Although K2 Jasper is the most commonly used name for marketing this material, it is definitely not jasper. If you examine the rock with a magnifying glass, you will see cleavage faces of feldspar minerals and black flakes of biotite. The white granite is very fine-grained and composed of quartz, sodium plagioclase, muscovite, and biotite. Some specimens show strong alignment of the biotite grains and could be called "granite gneiss." Examination of the azurite spheres with a good hand lens or microscope reveals that the azurite is present along mineral grain boundaries, within tiny fractures, and as a "dye" penetrating the feldspar grains. The azurite is a secondary material that clearly formed after all of the other minerals in the granite had solidified from the parent melt. Many people who see this material at shows immediately think that the round blue dots have been produced with a dye. They usually have a hard time believing it's azurite since azurite rarely occurs with granite.



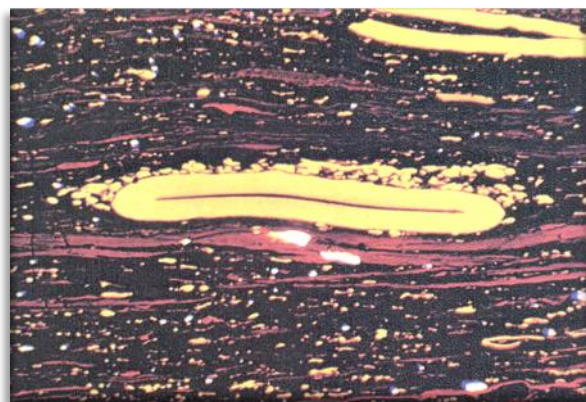
Azurite and malachite in K2 granite.

Some specimens also have small areas that are stained green with malachite. In the close-up photo of K2 granite, you can see dozens of small green malachite stains. K2 granite is named after a mountain in the Karakoram Range near the border between Pakistan and China. K2, also known as "Mount Godwin Austen," is the second-highest mountain in the world. The azurite granite is found in colluvium near the base of the mountain. It is in a very remote area visited by very few people.

<http://geology.com/gemstones/k2/>



If you think that coal is a boring black rock, then you have never seen it through a transmitted light microscope. The microscope reveals coal's hidden beauty as well as its organic composition. Coal seams form from thick accumulations of plant debris, usually deposited in a swamp. The tiny particles of plant debris and swamp sediment give a spectacular show of color when viewed through the microscope. Well-preserved woody material is bright red, spores are brilliant yellow, algal material is yellow-orange, charcoal and opaque minerals are black, and grains of many transparent minerals are white. It's hard to believe that coal can be so colorful!



A thin section of coal viewed with transmitted light.

To best understand coal we should start with a hand specimen of coal. If we look closely we will see that it is not a uniform black. Instead there are different shades of black and also different lusters. The coal shown above is a "bright banded" coal. It is dominated by bright shiny bands which represent well-preserved woody material. Between those bright bands are some thin dull bands. Those dull bands are composed of substances such as mineral material, degraded woody material, and charcoal (from ancient fires in the swamps). As mentioned above, coal forms from plant debris that accumulates in an environment such as a swamp. There are many possible situations of plant types and environmental conditions that produce a variety of coal types. Within a swamp some areas might be shallow and other areas deep. Some areas might have woody plants and other areas grassy. The environment might be changing over time, making the bottom (older part) of the coal seam very different from the top. These variations result in the formation of many different types of coal - all within the same coal seam. Coal is a very complex rock, and that complexity is part of what makes it so interesting.

<http://geology.com/articles/coal-through-a-microscope.shtml>

CVRMS FIELD TRIP TO FRYXELL GEOLOGY MUSEUM AND LIZZADRO MUSEUM OF LAPIDARY ARTS

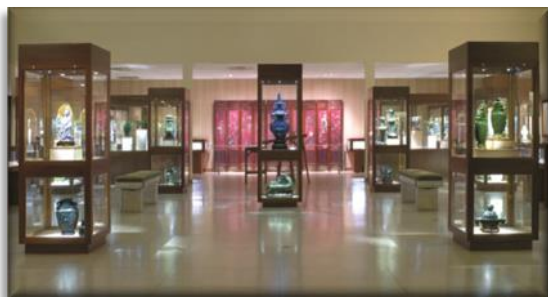
Following last year's superb field trip to the Field Museum of Natural History, CVRMS Director Bill Desmarais is organizing another field trip by bus, this year to the **Fryxell Geology Museum** in Rock Island and **Lizzadro Museum of Lapidary Art** in Elmhurst, Illinois, scheduled for **Saturday October 21st**. The charter bus will depart from Cedar Rapids and also pick up passengers in Iowa City enroute to Rock Island's Augustana College and the Fryxell Geology Museum, then to Elmhurst and the Lizzadro Museum of Lapidary Art. **The Fryxell Museum**, named after Dr. Fritiof Fryxell, was started in the late 1880s with a modest natural history



Fryxell museum visitors are greeted by a 22-foot-long skeleton of a *Cryolophosaurus*, a large carnivorous dinosaur.

collection. Today it is one of the largest and finest collections of rocks, minerals and fossils in the Midwest, with more than 1,500 rock, mineral, and fossil specimens, and a fluorescent mineral display. It includes a cast of a *Tyrannosaurus rex* skull and a complete 22-foot long skeleton of *Cryolophosaurus*, a large crested carnivorous dinosaur collected in 1991 in Antarctica by Professor Bill Hammer and his students. One display shows a rare amphibian fossil from the famous Mazon Creek area. This fine specimen shows nice preservation of the skull, body and limb material. Also on display is a quarter-ton piece of the Canyon Diablo meteorite, a planetarium show with images and information on the wonders of the night sky, and a newly acquired piece of the Chelyabinsk meteor that exploded over Russia on Feb. 15, 2013.

The **Lizzadro Museum of Lapidary Art** in Elmhurst (a western suburb of Chicago) is dedicated to the art of cutting and polishing stones. The museum was founded by Italian immigrant Joseph F. Lizzadro, Sr., an electrical engineer with a life-long interest in



The Lizzadro Museum of Lapidary Art

lapidary and a special fondness for jade. As his collection grew he desired to display it to the public, and was granted permission to build a museum within the city's Wilder Park. The museum's doors opened in November, 1962, and it include displays gemstone treasures, antiques to modern, with a blending of earth science exhibits.

The building itself is designed to resemble a jewelry box in a park setting and features more than 200 exhibits including the **Castle Lizzadro**, which is carved out of gold. Housed within the museum are rare pieces such as a jade imperial altar set completed during the Ming Dynasty, (1368-1644) and a cinnabar screen encrusted with gemstones that was a gift to the Chinese emperor, Qianlong, in 1791. Both pieces were originally housed in the imperial palace of China. The lower floor of the museum is an interactive earth science center containing unusual rocks, fossils and hands-on exhibits. The field trip will be free to club members, with a minimal charge to non-members if unclaimed seats remain. To register for the field trip contact Bill Desmarais at 319-365-0612 or desmarais_3@msn.com.



Carved cinnabar statue in the Lizzadro Museum of Lapidary Art.

Seats are limited so don't delay and miss this great trip!

2017 Officers, Directors, and Committee Chairs

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Webmaster	Sharon Sonnleitner (sonnb@aol.com)	396-4016

Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:00 p.m., temporarily at a location to be announced. The December meeting is a Christmas dinner held near 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:

**Dale Stout
2237 Meadowbrook Dr. SE
Cedar Rapids, IA 52403**

CVRMS website:
cedarvalleyrockclub.org

Next Meeting:
MAY 16
Indian Creek Nature Center
5300 Otis Rd. SE - Cedar Rapids
Craig Johnson
"Red sky at night, sailors' delight. Red sky
in the morning, sailors take warning"



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