

Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS

SEPTEMBER 2019

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

Next CVRMS Meeting Tues. Sept 17

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

featured speaker:

Brent Studer

Kirkwood College

Professor of Astronomy

“The Origin of Earth's Water”



How did Earth come to be a planet with over 60 percent of its surface covered by water? Of all the rocky planets, Earth alone has an abundance of this precious compound and scientists have been trying to figure out how Earth got its water for decades. Recent research may have finally solved the mystery and tonight we'll learn about the competing hypotheses and what may be the answer.

CVRMS Members

Wear Your Name Badges to the Meeting!

**Let's make guests and visitors
welcome at our meetings**

Larimar: The Blue Stones of Atlantis



Larimar, also called "*Stefilia's Stone*," is a rare blue variety of the silicate mineral **pectolite** found only in the Dominican Republic, in the Caribbean. Its coloration varies from white, light-blue, green-blue, to deep blue. Pectolite is usually a soft and very

delicate mineral composed of dense radiating fibers, but sometimes the fibers are tough and interlocking and make it very solid. The Larimar variety is of the tough type hence its ability to withstand carving and faceting. There is a legend that Larimar was originally discovered in 1916 and its locality subsequently forgotten. In 1974, Norman Rilling, a visiting member of the US Peace Corps, found the locality together with Miguel Méndez, a Dominican native. Together they named this stone "Larimar," which is a combination of "Larrisa" (Méndez's daughter's name) and "mar" (sea in Spanish). Due to its scarcity and limited source, Larimar is difficult to obtain outside of the Caribbean. The color of Larimar is caused by copper inclusions. Its color is rarely solid; it is almost always blue with interconnecting white lines and rough circles. A radiating pattern of crystal needles can often be observed within the Larimar. The blue color can vary in intensity from very light to greenish-blue to deep sky blue. Although Larimar has a very attractive color, it is a soft gemstone and is easily scratched. Its color may also fade upon prolonged exposure to strong sunlight. This, combined with its scarcity, limit its popularity as a mainstream gemstone.

<http://www.geologyin.com/2017/07/larimar-blue-stones-of-atlantis.html>

CVRMS Board Minutes Aug 27

Members present Rick Austin, Marv Houg, Dale Stout, Ray Anderson, Bill Desmarais, Sharon Sonnleitner, Jay Vavra, Dell James, Kim Kleckner.

7:00 p.m. Meeting called to order by Marv Houg at his home.

Show 2020 discussion:

Programs: Ray has 4 maybe 5 speakers lined up for show. Still working on it. Ray will work on posters that are needed.

Displays: Marv said that Phil Burgess has 112 lb. meteorite.

Raffle prizes: Kim has a geode cracker that belonged to Terry Baty. It has been fixed up and never used. Will donate to raffle prizes. Discussion about other possibilities from vendors, etc. Will work on it.

Ray reminded us about the need for insurance to cover the various display items we are seeking. That is usually a requirement of the lenders.

Vendors: May have some room for additional vendors. Sharon and Marv will work on it.

Auction 2019:

We have over 1,400 lots. Terry Baty's collection has been added, not all but a lot, and some others reduced to accommodate these additions. **Flyers** are out and Kim will get them posted on Facebook. **Advertising** is being done. Board decided that there is no need to publish an ad in the Gazette.

New road signs are needed. Bill looked into price, etc., and plastic sturdy signs size 18x24 are \$35 each with a minimum order of 6. Motion made by Ray that we purchase signs. 2nd by Rick. Discussion followed regarding the need to get signs ordered and finished before auction. Motion passed.

Meals and food. Dell and Sharon will handle it. Pizza on Friday night. **Sales tax:** the necessity for, etc. We will charge sales on all items, except for those with sales tax permits. Tom and Kim are considered administrators on the Facebook account.

Bus trip to Omaha Zoo October 6:

Bill has 36 signed up. There is still room so anyone interested has to let Bill know. It is free to members and family. You will pay for Zoo admission at the door when you arrive.

Other items:

The display case for River Products is still in planning stages. Ray asked for ideas/requests for program ideas starting this fall. Kim suggested that we have more hands on-stuff. Perhaps instead of a college level talk, to bring a simplified or easier subject to discuss. Also feels like we do not encourage new members to return because they are not welcomed. Dell suggested wearing our name tags and having guests or new members do the same. Sharon thought someone should be designated to talk to new people. Ray would like to see a show and tell atmosphere at all meetings. Maybe someone could speak about their collections or whatever. Report on an interesting trip or whatever.

T-shirts for workers. Vote was cast and the shirts will be green. This worked well at the previous show by accident. Anyone planning to work at show or auction, must let Sharon know your size before September 3. Ray will order.

Motion to adjourn by Ray, 2nd by Jay. Adjourned 8:15p.m.

Respectfully submitted, **Dell James**, Secretary

Mining Old Dutch Cleanser

A very fine-grained volcanic ash is mined from a layer of white *pumicite*, a clean and only slightly lithified volcanic ash that dips at a 45° angle below the desert floor at Last Chance Canyon in the El Paso Range just north of California's Garlock Fault. There are two main workings, western and eastern, perched on the lip of the canyon, the western accessed by an inclined rail tramway to the canyon bottom until a road was finally graded to the eastern. There's an interesting background to this mine. The Cudahy Company was established in Milwaukee in 1887, becoming one of the largest groups of meat packing companies in the U.S. The founders were Irish brothers, Patrick and Michael Cudahy. In 1905, Cudahy Packing Company was looking for a way to use animal fat in the manufacture of soap. Instead, it became the first company to market scouring powder when it introduced Old Dutch Cleanser. The initial source was a mine in Meade County, Kansas, where pumice was mined for use in cleaning the floors of slaughterhouses in Chicago. Cudahy Packing Company began operations at the Last Chance Canyon mine in California in 1923. Twelve men were employed to produce 100 tons of pumicite per week. **Pumicite**, or fine-grained pumice, is defined as minute grains, flakes, threads or shards of volcanic glass, with a size finer than 4 millimeters. The ore initially was lowered 475 feet down a rail tramway to loading bins in Last Chance Canyon. From there it was trucked seven miles south to a Southern Pacific siding, where it was loaded on rail cars for delivery to Los Angeles. The mine produced 120,000 tons of pumicite before it was closed in 1947. That's a lot of cleanser. So meatpacking and the marketing of one of the best-known scouring cleansers became related. We can add table salt to the mix. In 1904, Joseph Cudahy married Morton Salt heiress Jean Morton. In 1914, the millionaires built a mansion in Lake Forest, Illinois. Based on a palace in Monaco, it was designed by architect David Adler and remains a private residence. Thus pork, pumicite, and sodium chloride all became united in one family. Would you have guessed? Getting to this mine is easy, if you don't mind dirt roads. No trees to fall and block the road, no sand traps and no deep mud, and plenty of off-roaders out there exploring to lend a hand if you get stuck, somehow.



Easternmost portal of the Cudahy Mine



https://geologicalspecimensupply.com/blogs/news/the-cudahy-mine-at-last-chance-canyon?step=contact_information

Australian Prospector Unearthed Something Far More Rare than the Gold He Was Searching For

Four years ago, David Hole found a mysterious looking rock near Maryborough, about 37 mi. north of Ballarat, Australia. The prospector was surveying the area when his metal detector alerted him to what he assumed was gold. After digging up a red-colored rock which was indeed not gold, Hole took the unusually heavy boulder home with him nonetheless, intrigued about what might be inside.



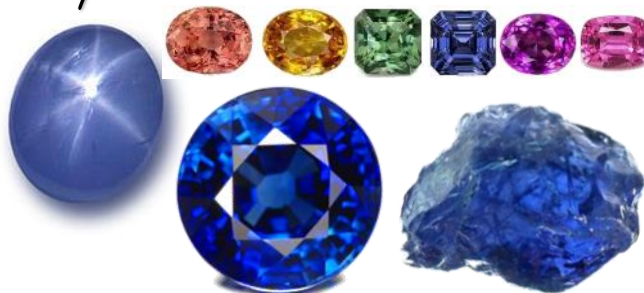
The Marborough meteorite is 15 in. x 6 in. x 6 in.

Despite his best attempts -- using an angle grinder and sledgehammer -- Hole could not bust it open. After holding onto it for a few years, the Victorian man finally made contact with the Melbourne Museum in an attempt to, once and for all, figure out what it was. "I've looked at a lot of rocks that people think are meteorites," Melbourne Museum geologist Dermot Henry said. "And as we often have to say, they're *meteor-wrongs*," he laughed. But not this time. Testing carried out by Henry and Dr. Bill Birch confirmed Hole had certainly stumbled across a meteorite -- 37 pounds of 4.6 billion-year-old space rock. It was determined to be an H5 ordinary chondrite meteorite, and further analysis also revealed that the rock lacks weathering, suggesting that it had been on Earth for less than 200 years. The Maryborough meteorite will join Melbourne Museum's collection of over 400 meteorite specimens and was put on display on August 11 for National Science Week.

<https://www.techtimes.com/articles/244629/20190719/gold-nugget-found-in-australia-turns-out-to-be-a-4-6-billion-year-old-meteorite.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). It typically contains 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. 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.

What in the World?



What in the World is this beautiful marine specimen??
The people who discovered it called it a
“purple disco ball”

June’s Photo



Last month’s *“What in the World”* photo is Scanning Electron Microscope image of chalk; that is, a component of chalk, specifically *Emiliana huxleyi* - a species of coccolithophore found in almost all ocean ecosystems from the equator to

sub-polar regions. It is a single-celled phytoplankton covered with uniquely ornamented calcite disks called coccoliths. *E. huxleyi* is one of thousands of different photosynthetic plankton that freely drift in the euphotic zone of the ocean, forming the basis of virtually all marine food webs.

Rock Calendar CVRMS EVENTS OF INTEREST

2019

Sept 17 —CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Feature Speaker
“The Origin of the Earth’s Water”
by Dr Brent Studer—Kirkwood College

Sept. 21-22—CVRMS Rock Auction
Amana RV Park and Event Center
Amana, Iowa
<http://www.cedarvalleyrockclub.org/auction.htm>

Sept. 27-29 - Geode Fest and Rock Show
Chaney Creek Boat Access
Illinois Highway 96 N
Hamilton, Illinois
<http://www.keokukiotourism.org/>

Oct. 15 —CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Feature Speaker
“CVRMS Scholarships for Field Work”
by University of Iowa Geology Students

Nov. 19 —CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Feature Speaker
“The Origin of the Earth’s Water”
by Jane Gilotti —University of Iowa

Dec. 10 - CVRMS Christmas Pot Luck
Hiawatha Community Center 6.30 pm



Ask a Geologist by Ray Anderson aka "Rock Doc", CVRMS Vice President

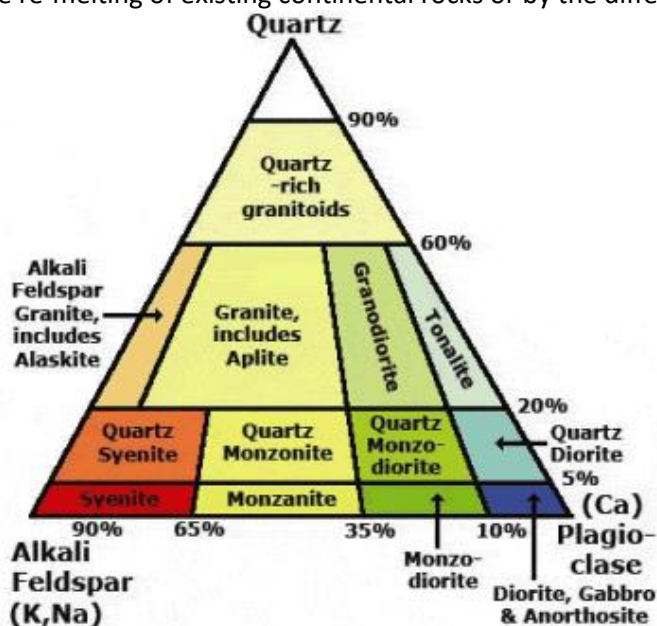
Ask a Geologist is a monthly column that gives CVRMS members an opportunity to learn more about a geologic topic. If you have a question that you would like addressed, please send it to rockdoc.anderson@gmail.com, and every month I will answer one in this column. Please let me know if you would like me to identify you with the question. I will also try to respond to all email requests with answers to your questions.

I picked up a rock the other day and Rona said "it's just granite." Just granite! Granite is special stuff!

Granite is not known to have formed on any other body in the Solar System, in fact it is the signature rock of the planet Earth. And on Earth it is not found in the ocean basins, only from the continents where it is the most common igneous rock (solidified from magma). Geoscientists recognize granite as an igneous rock that is composed of 10 to 50% quartz (typically semi-transparent white) and 65 to 90% total feldspar (typically a pinkish or white hue) with mica, and other minerals in lesser quantities. It is formed from magma (molten rock) that cools slowly enough to allow it to completely crystallize into interlocking minerals that can be seen with the unaided eye. Crystallization of granite occurs at temperatures between about 2300° and 2200° F and takes thousands to tens of thousands of years. Granitic magma can be formed in many ways, most commonly by the re-melting of existing continental rocks or by the differentiation of mantle-sourced magma. In order to crystallize, granite must intrude older rocks that insulate it, and allow it to cool slowly. The magma is intruded into continental crust and usually solidifies at depth of between 5,000 and 15,000 feet. Granitic rocks are commonly classified based on the percentage of the minerals quartz, plagioclase, and alkaline feldspar (see illustration). Granites can also be classified based on the environment in which they formed: a **tectonic classification**.

S-type Granites are thought to originate by melting of a pre-existing metasedimentary or sedimentary rocks. Called *peraluminous granites*, their minerals have more Al_2O_3 than $(Na_2O + K_2O)$. The minerals muscovite and corundum may also form in these rocks. S-type granites can be considered *orogenic granites* since they are found in the deeply eroded cores of fold-thrust mountain belts formed as a result of continent-continent collisions, such as the Himalayas and the Appalachians. **I-type Granites** are considered to have formed by melting of preexisting igneous rocks. They are called *metaluminous granites*, and are identified by the presence of biotite and hornblende as the major mafic minerals and the absence of muscovite. I-type granites are related to plate subduction and are found along convergent continental margins such as the Sierra Nevada batholith of California and Nevada.

A-type Granites have more Na_2O and K_2O than Al_2O_3 and tend to be relatively iron-rich. Minerals like the sodic amphiboles *riebeckite* and *arfvedsonite* and the sodic pyroxene *aegerine* are commonly found in these rocks. They are considered anorogenic granites because they are generally found in areas that have not undergone mountain building events. Instead, they appear to be related to continental rifting events, where upwelling asthenosphere raises the geothermal gradient melting crustal rocks, which cool to form the granites. **M-type Granites** or *mantle derived granite* were clearly sourced by crystallization of differentiated mafic magmas, generally derived from the mantle. These granites are rare, because it is difficult to turn basalt into granite via fractional crystallization (a process in which pressure and temperature conditions allow some minerals to form in a magma and sink to the floor of the magma chamber, changing the chemistry of the remaining melt). So the common granite rock that you find has been through a wild geological history, unique to Earth, and it can tell geoscientists a lot about it.



Triangular diagram classification method for granitic rocks based on the relative abundance of feldspars (K-Na-Ca) and quartz.

Scientists Discover 161 Million-year-old Dinosaur with Rainbow Iridescent Feathers

The discovery that dinosaurs were feathery, not leathery, means we've had to rethink how they might have looked - and now there's evidence that at least one dinosaur could have been as brilliantly colored as some of the most jewel-hued modern birds. *Caihong juji*, a name that means "rainbow with the big crest" in Mandarin, was a tiny, duck-sized dinosaur from China. The fossil it left behind indicates a bony crest on its beak, and a brilliant, iridescent ruff of feathers around its neck - the earliest evidence of a color-based



display. The international team of researchers who described the new dinosaur believe that these features may have something to do with attracting mates. "Iridescent coloration is well known to be linked to sexual selection and signaling, and we report its earliest evidence in dinosaurs," said researcher Julia Clarke. "The dinosaur may have a cute nickname in English, Rainbow, but it has serious scientific implications." The research team determined the possibility of iridescent feathers, colored like those of a hummingbird, by the fossil. The slab of rock, found by a farmer in 2014, contained nearly a complete skeleton. While the feathers themselves had long since decayed, they left impressions in the rock around the fossilized bones. "I was shocked by its beautifully preserved feathers, even though I had seen many feathered dinosaur fossils previously." It's difficult to tell for certain what color the feathers were, but the fossil was so detailed that it preserved the shape of the melanosomes, the organelles inside cells responsible for pigmentation. And when the team compared these melanosomes to those of living birds, they most closely resembled melanosomes found in the iridescent, rainbow-hued feathers of hummingbirds. *Caihong juji* lived around 161 million years ago, in the Jurassic, and it combines older features with new. <http://www.geologyin.com/2018/01/scientists-discover-161-million-year.html?fbclid=IwAR0gbbpOvnlRUcOYcl6Fh7ftofCmqlikMeCzesWY6Rgsni7oi7eRgqkREbk#kTOx7QdE3bC6USZq.99>

Eureka! Mother Lode of Gold Found in Australian Mine

Miner Henry Dole was in for a shock when he went into the Beta Hunt mine in southwestern Australia after the workers set off some explosives. "Everything was covered in dust, and as I watered the dirt down there was just gold everywhere, as far as you could see," he told Australia's ABC News. "There was chunks of gold in the face, on the ground, truly unique, I reckon. ... I nearly fell over looking at it ... we were picking it up for hours." That was just the beginning. The Canadian mine owner RNC Minerals says the find, from a single cut in the mine, includes about 9,250 ounces of high grade gold. At today's gold price, that's worth some \$11 million. The amount of gold found is impressive - but so is the sheer size of the stones. One of them weighs in at more than 200 pounds, and contains about 2,440 ounces of gold. According to ABC, it "took three men to lift it onto the back of a ute (utility vehicle)". Another large piece weighs nearly 140 pounds and contains about 1,620 ounces of gold



Two of the largest specimens containing gold recovered from the Beta Hunt Mine.

"This is a spectacular discovery - possibly the find of the century in the Australian Gold Fields," Ross Large, professor of geology at the University of Tasmania, told the Financial Times. "This is the sort of find that you would associate with the 1860s Gold Rush and will probably cause a boom in exploration." The company adds that there's a zone in the rock which, "under the right conditions, allow large gold crystal growth and extremely high-grade gold deposition." But RNC president Mark Selby told ABC that some of the largest stones will be auctioned off separately. "There's a pretty select group of collectors who this would appeal to," he said.

https://www.npr.org/2018/09/11/646705647/eureka-mother-lode-of-gold-found-in-australian-mine?utm_source=npr_newsletter&utm_medium=email&utm_content=20190710&utm_campaign=npr_email_a_friend&utm_term=storyshare

reprinted from <https://www.buroaklandtrust.org/the-quarrymans-hammer/>

THE QUARRYMAN'S HAMMER

by Professor Lon Drake, University of Iowa August 1, 2019

In 1968 I was scoping out an abandoned quarry north of Iowa City for a class field trip. While there I found the remains of an old roughly made steel hammer. The flattened and splayed wide end had obviously struck stone or steel a few million times. The wood handle had mostly rotted away, but the way the tool was tucked back on a little ledge beneath an overhang looked like someone had set it there on purpose, perhaps with the intent of coming back for it.



The repaired quarryman's hammer.

At that time, I was making and collecting hand tools to build our house, so I took it with me, rebuilding the handle from a broken one from a wood splitting maul. About six years later I was building our house and using the chunky hammer to drive stakes for concrete forms, and was visited by "Uncle Bill" Furnish, who was a geology professor at UI since 1953. He fondled the hammer rather covetously, so of course I inquired why. It transpired that he was talking to the UI museum in the MacBride Hall about creating a display focusing on the history of local



The author with the hammer.

quarry operations, to be accompanied by a guide to the different formations now exposed in buildings, curbs, tombstones, beer cellars, retaining walls, etc. The fossils exposed would be important to matching back to bedrock sources. He already had a set of the other quarryman's tools, which he had found over the years, including a set of "feathers," "spoons," and "star drills," but the old hammers had evidently wandered off to other uses when the quarries ceased operation. So I gave Bill the hammer. I do not know what became of the quarry/rock display, but I've found my hammer now living amongst antiques on display. And the Museum was kind

enough in July to loan it back to me for a photo-op. The quarry I originally found it in was mined for much of the stone that went into the Old Capital building on campus; cornerstone date is 1840. After the Civil War, steam power began to replace manpower in quarrying dimension stone, and the industry shifted to a few large, deep pits in the highest quality stone. Once you go deep you have created a large diameter well and only steam pumps running 24/7 could keep ahead of the inflow of groundwater. Poured concrete arrived here about 1900 and the large dimension stone quarries gradually shut down except for just a few, which produced the very highest quality facing for buildings, at prices competitive with brick and concrete. Limestone from Salem, Indiana, dominates that scene today, and has for a century. With closure, the deep pits immediately flooded and became deep



A poor marriage.

cold lakes. In modern times these are stocked with trout and also serve for recreational scuba diving. The Cedar Valley Quarry is our best known local example. And what do you do with all the little quarry shelf notches in the hillsides abandoned all along the Iowa River? Some were adsorbed into the widening roadbed of Highway 6. The one below the UI president's home is still just a little cliff tucked back in the bushes. The one across the river from the UI Memorial Union was maintained for decades as a little decorative landscaping garden, and now has a whole building jammed rather incongruously into it. Old tools, old trees, and old landscapes all have their stories to tell. And if we pay attention, they help reveal how we evolved to where we are today, for better and for worse, and sometimes offer inspiration for the future.

<https://www.buroaklandtrust.org/the-quarrymans-hammer/>

Earth Is Now Approaching The Same 'Meteor Swarm' That Wiped-Out A Siberian Forest

Our solar system is a dangerous place, and the Earth is inching closer to one of its riskier places, the “**Taurid swarm**” of meteors. It’s a theorized vast cloud of debris and possibly large objects, leftover from a massive comet’s disintegration, that is suspected of causing catastrophic collision events in the past. According to Western Meteor Physics Group’s data analysis, Earth is now approaching within 18,500,000 mi of its center, the closest such encounter since 1975. Closeness is critically



important because our planet is predicted to pass directly through the “**Taurid swarm**” in November 2032. There are reasons to suggest that we

need to be ready for something serious. As Earth orbits the Sun, its orbital path often goes through dust and debris left by comets, with material no bigger than a grain of sand busting into Earth’s atmosphere and burning up as “shooting stars”. Mostly, they’re harmless, but the Taurid swarm is an exceptionally large cloud of debris, probably from Comet 2P/Encke, and scientists think it may be responsible for some once-per-1,000-years catastrophic events on Earth, including the famous “**Tunguska Event**” when on June 30, 1908, almost 800 square miles of Siberian forest were flattened by ... something. The Taurid complex-giant comet hypothesis proposes that a giant comet fragmented in the inner solar system, producing dust and small Near-Earth Objects (NEOs), including 2P/Encke and other asteroids, still present today. Among the observational evidence is increased “fireball” shooting star activity when Earth gets close to the “**Taurid Swarm**”, and increased impacts on the Moon. Calculations show that now is the best time to view and study the Taurid swarm until the early 2030s, so astronomers are getting ready to do just that. “The June-August 2019 encounter of the TSC [Taurid Resonant Swarm] provides a unique opportunity to identify additional NEOs of the swarm,” write UWO astronomers David Clark, Paul Wiegert and Peter Brown in ***The 2019 Taurid resonant swarm: prospects for ground detection of small NEOs***.

“Dedicated surveys will at the very least be able to place limits on the NEO density near the swarm center.” So in August, astronomers in the Western Meteor Physics Group will take advantage of Earth’s proximity to observe the Taurid swarm up close using the [Canada-France-Hawaii Telescope at the University of Hawaii](http://www.canadafrancehawaii.org/) in August. Using the results of computer simulations, the astronomers calculated two optimal viewing times and telescope pointing locations for the Taurid swarm to properly investigate its overall risk potential. They’re looking for massive objects that could cause Earth a problem in 2032. <https://www.forbes.com/sites/jamiecartereurope/2019/06/11/earth-is-now-approaching-the-same-meteor-swarm-that-wiped-out-a-siberian-forest/>

What is Fire Agate?

Agate is a semi-precious gemstone formed by relatively recent volcanic activity. It is outwardly similar in appearance to quartz, but also shows interesting swirls, bubbles and patterns. Fire agate, a variety of chalcedony, is a



semi-precious natural gemstone discovered so far only in certain areas of central and northern Mexico and the southwestern United States (New Mexico, Arizona and California). Fire agates have beautiful iridescent rainbow colors, similar to opal, with a

measurement of hardness on the Mohs scale of between 5 and 7. This reduces the occurrence of scratching when polished gemstones are set in jewelry. The vibrant iridescent rainbow colors found within fire agates, created by the Schiller effect as found in mother-of-pearl, is caused by the alternating silica and iron oxide layers which diffract and allow light to pass. They form an interference of colors within the microstructure layering of the stone causing the fire effect for which it is named. The fire agate and chalcedony of the Southern New Mexico–

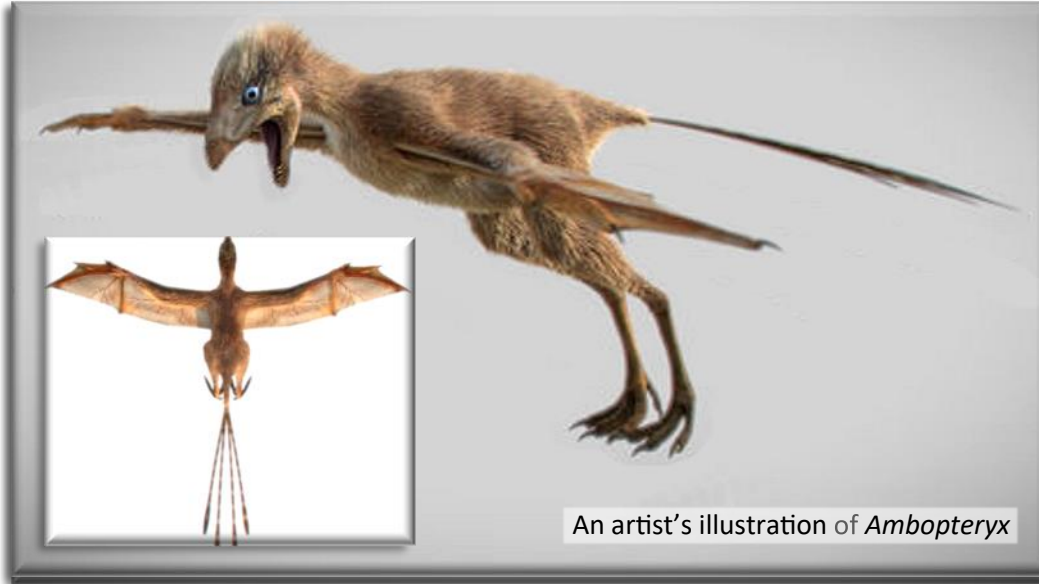


Arizona border area are formed when low pressure and low temperature epithermal hydrothermal waters (122°-392°F) carrying colloidal SiO₂ and iron oxides are injected into cavities in volcanic rocks such as gas bub-

bles in flow rocks, irregular-shaped vug fillings, or along fault or bedding plane fractures. Approximately 24-36 million years ago these areas were subjected to massive volcanic activity during the Tertiary Period. The fire agates were formed during this period of volcanism when hot water, saturated with silica and iron oxide, repeatedly filled cracks and bubbles in the surrounding rock.

<http://www.geologyin.com/2019/06/what-is-fire-agate.html>

New Bat-like Dinosaur was Early Experiment in Flight



An artist's illustration of *Ambopteryx*

“This fossil seals the deal—there really were bat-winged dinosaurs,” said Stephen Brusatte, a paleontologist at the University of Edinburgh. Scientists were already confident that a number of dinosaurs could fly. There are birds, of course, which are technically dinosaurs and appeared during the Jurassic period, at least 150 million years ago. Other dinosaurs sported feathers on their hind- and forelimbs, effectively giving them four birdlike wings. Then, in 2015, researchers discovered a [dinosaur that may](#)

[have flown more like a bat](#). Named *Yi qi* (Mandarin for “strange wing”) and discovered in northwestern China, the crow-size creature appeared to have a flap of skin stretched between its body and arm bones that was supported by a rod of cartilage. But the fossil, which belongs to an enigmatic group of dinosaurs called the **scansoriopterygids**, was partial and poorly preserved, so scientists couldn’t be sure it actually flew like a bat. *“There’s been debate about whether the skin flap was really an airfoil or used for another purpose,”* Brusatte said. The new fossil, named *Ambopteryx longibrachium* (meaning “both-wing” and “long arm,” referring to this second method of dinosaur flight) and dated to about 163 million years ago during the Jurassic period, doesn’t have that problem. The fossils were uncovered by a farmer who provided them to the Chinese Academy of Sciences’ Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) in Beijing. Nearly every part of the little dino is well-preserved, including membranous batlike wings similar to those of *Yi qi*. *“You could have fit it in your hand,”* says IVPP paleontologist and study author Jingmai O’Connor. *“It would have been this tiny, bizarre-looking, buck-toothed thing like nothing alive today.”* Even *Ambopteryx*’s stomach contents were preserved. Researchers recovered pieces of bone and small rocks called gastroliths, which modern birds use to grind plant material, indicating the species may have been omnivorous. Though the creature was replete with feathers, these were a downy fuzz and not used for flight. O’Connor also speculates that males of the species may have sported long ornamental tail feathers, possibly to woo females, as can be seen in other scansoriopterygid fossils. *Ambopteryx*’s wings were formed by elongating the humerus and ulna, the bones of the upper and lower arm in humans, the team reports today in *Nature*. Birds instead achieved flight by elongating their metacarpals, analogous to our fingers. *“The main lift-generating surface of birds’ wings is formed by feathers,”* O’Connor explained. *“In bats, pterosaurs [dinosaur-era reptiles that flew similar to bats], and now scansoriopterygids—you instead have flaps of skin that are stretched out in between skeletal elements.”* *“This new discovery shows *Yi qi* was not an aberrant species, but that there was an entire group of bat dinosaurs taking to the skies in the [Jurassic],”* said Darla Zelenitsky, a paleontologist at the University of Calgary in Canada who has studied feathered dinosaurs. However, although nearly 10,000 species of birds live today, no scansoriopterygids survived past the end of the Jurassic. That suggests their early experiment in flight was far less successful, O’Connor said. Still, she said, their existence is remarkable, given that flight has only evolved in a handful of groups of animals across the entire history of life. *“The idea that flight evolved more than once in dinosaurs is incredibly exciting and hasn’t quite sunk into the scientific community yet.”* *“The evolution of flight wasn’t a gradual march from dinosaur to bird,”* Brusatte added. *“It involved lots of experimentation and tinkering.”*

<https://www.sciencemag.org/news/2019/05/new-batlike-dinosaur-was-early-experiment-flight>



Cedar Valley Rocks & Minerals Society will hold its **2019 consignment Auction on September 21st - 22nd** in the Morton Building at the Amana RV Park, Amana, IA. The auction assists collectors or families of collectors to dispose of their collections. Knowledgeable club members act as auctioneers. Auctions typically attract about 100 bidders and about 1400 lots will be auctioned.

Viewing is Friday night, Sept. 20, from 5:00 - 7:30 pm, Saturday morning, Sept 21, from 7:30 - 9:00 am. and Sunday morning, Sept 22, from 8:00 - 9:00 am. The **Saturday Auction runs from 9:00 a.m. to about 8:00 pm, with hot food available during the day and a dinner offered from 5:30 - 6:00 pm.** The **Sunday Auction runs from 9:00 am to about 3:30 pm, again with hot food available.**

Cash, credit cards (with small service fee), or good checks are accepted for payment. If you can't stay for those special lots you want, you can leave a maximum bid, and a club member will bid for you up to your maximum.

State sales tax of 7% will be added to all items. Bidders who provide Iowa tax exempt certificates are exempt.

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

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

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

Profits from the auction provide scholarships for University of Iowa and Cornell College geoscience students and to assist VAST (the Grant Wood AEA Van Allen Science Teaching Center).



"Bill's Big Bus Boogie" 2019

Omaha's Henry Doorly Zoo and Aquarium



The 2019 "Bill's Big Bus Boogie" adventure will take CVMRS members on a field trip to the **Omaha's Henry Doorly Zoo and Aquarium** on **Sunday, October 6, 2019**. Consistently ranked one of the world's best zoos, Omaha's Henry Doorly Zoo and Aquarium is the ultimate interactive zoo experience and a biological park leading the nation's conservation efforts. Visit the world's largest indoor desert and nocturnal exhibits along with one of North America's largest indoor rainforests. Other world-class exhibits include the **Scott Aquarium, Hubbard Orangutan Forest and Gorilla Valley, Lozier IMAX® Theater, Durham's Bear Canyon, Berniece Grewcock Butterfly and Insect Pavilion**, and more. Explore **Kingdoms of the Night** featuring the world's largest indoor swamp, a canyon and massive caves. Experience **Skyfari**, the aerial tram that transports guests to a new view of Omaha's Henry Doorly Zoo and Aquarium. Plan your visit in advance by downloading our free mobile app - available through Apple's App Store and Google Play. The club will pay for the bus, for those whose club membership dues were paid up as of **May 1, 2019**, so you need only pay museum admission. You may order zoo admission tickets in advance on-line if you wish to avoid a wait in the ticket line.

On **September 1**, the trip was opened to the public for \$25/seat, so contact **Bill Desmarais** at **319-365-0612** or desmarais_3@msn.com if you are interested in participating. Departure and arrival times and details of the trip will follow in future club meetings, newsletters, and on the club website.



[Click for link to downloadable zoo map](#)

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

2019 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 7:15 p.m., at the Hiawatha Community Center in the Hiawatha City Hall, [101 Emmons St., Hiawatha IA](#). The December meeting is a potluck dinner held on the 3rd Tuesday at 6:30. June, July, and August meetings are potlucks held at 6:30 p.m. at area parks on the 3rd Tuesday of each month

CEDAR VALLEY ROCKS & MINERAL SOCIETY

CVRMS was organized for the purpose of studying the sciences of mineralogy, geology, and paleontology and the arts of lapidary and gemology. We are members of the Midwest (MWF) and American (AFMS) Federations. Membership is open to anyone who professes an interest in rocks and minerals.

Annual dues are \$15.00 per family per calendar year. Dues can be sent to:

**Dale Stout
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