Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS | AUGUST 2023 | VOL. 49, ISSUE 08

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

Next CVRMS Meeting
Tues. August 15
6:00 pm; Eat at 6:30
Pot-Luck Picnic!

Morgan Creek Park

Bingo Night
Rock Identification
Rock Show & Tell
Bring Your Favorite Dish to Share
Bring Your Own Table Service

The CVRMS will be offering a **Wire Wrap Jewelry** making class to interested members on August 17. Wire wrapped jewelry is formed by wrapping flexible wire around a gemstone (or even around itself) in patterns and twists. When a stone is used, the wire creates a casing so that it doesn't fall out, without the need to glue or drill holes in it. You can make all kinds of jewelry with this method, though pendants are especially common. The class, sponsored by the CVRMS and to be taught by Sara Wehage from Wapello, will be held at the Hiawatha Community Center on Thursday August 17 from 6:00—9:00 pm and **will be limited to the first 15 people who register**. Wrapping wire will be provided, but participants must furnish their own tools (see photo below), which can be found at Hobby Lobby or Michaels, and a rock or mineral specimen to wrap.

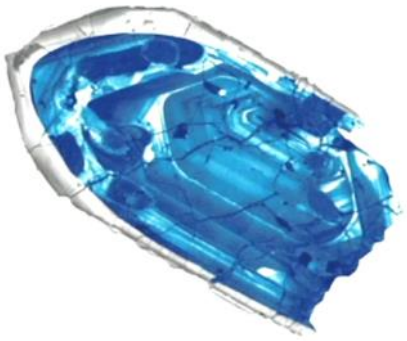
Pre-Registration is Required

To register contact Dale Stout at 319-899-8280.

Round Nose Pliers, Needle Nose (or Long Nose) Pliers without teeth, and Wire Cutters,

4.4 Billion-Year-Old Crystal is the Oldest Found on Earth?

Scientists say they have dated an ancient crystal called a zircon to about **4.4 billion years**, making it the earliest confirmed piece of the planet's crust. The findings – the first to describe the zircon – were published in the journal *Nature Geoscience*. This crystal is a translucent red, but glows blue when bombarded with electrons. At 400 micrometers long, its biggest dimension is just a tad larger than a house dust mite, or about four human hairs. The crystal was found in an arid region north of Perth, Australia, in a low range of hills called the Jack Hills, in 2001. Scientists say the crystal's chemistry, specifically its ratio of oxygen isotopes, suggests that the temperatures on Earth 4.4 billion years ago would have supported liquid water, and therefore perhaps life. Our planet is thought to be about 4.5 billion years old, but the oldest fossils are about 3.5 billion years old. That doesn't necessarily mean that no life existed before that time, but no direct evidence has been found yet. Very little is known about the first 600 million years or so of the planet's history, the "Hadean Eon." The leading theory is that Earth was bombarded by meteors in its early history, and it took a big hit from an object the size of Mars about 4.5 billion years ago, leading to the formation of the moon. These impacts vaporized the Earth's crust and formed a super-hot magma ocean. Evidence including this zircon suggests that within the first 100 million to 200 million years of its existence, our planet cooled enough to make crust. Steam from the atmosphere condensed to make oceans at this time.



The longest dimension about 0.01 inch

https://www.cnn.com/2014/02/24/world/oldest-earth-fragment/index.html#:

CVRMS Board Meeting July 27 — Minutes —

MEETING CALLED TO ORDER: 7:15pm by Marv Houg at his ***air conditioned*** house. Members present were Dell James, Matt Burns, Marv Houg, Dale Stout, Ray Anderson, Sharon Sonnleitner, and Jay Vavre.

SECRETARY'S MINUTES: motion for approval by Ray and second by Dale. Approved as published.

TREASURER'S REPORT: not completed.

2023 ROCK SHOW: No new issues.

2024 ROCK SHOW: March 23 and 24. Discussion about theme for the show. Decided on Corals and figure that they have been in the news lately and are a current topic of interest. Jay made a motion that the theme for the upcoming show in 2024 be corals. Matt seconded. All approved. Next step is to take it to the general meeting for consensus.

2023 AUCTION: Sept 9-10. **Five consigners** still have not returned contracts, but Marv talked to them and they will be at the auction. **Lunch Wagon** on Saturday, Dale will confirm. Consensus was that we need not do the dinner, just regular concessions. Dale will get the lunch lady's opinion. Sharon will provide food on Sunday. Dell will prepare lunch on Friday for the workers.

MISCELLANEOUS: We could still use an equipment dealer for the show but all vendors have been designated for space available. A dealer from Cedarburg,, WI expressed an interest.

FIELD TRIPS: Riverside Sand and Rock next trip but no date yet. Weather is an issue with the heat. Pray for rain.

OLD BUSINESS: Facebook update. No report because *"No Kim"*. **Get well quick!**

NAME TAGS: Jay has the name from a guy in Palo. He and Dale will exchange phone numbers for contact.

RAY REPORTED the CVRMS fluorescent display is cluttering up his garage. Suggestion was made that we could store in trailer currently in storage. We need to clean the trailer first.

AUGUST PICNIC: Rock bingo night. Bring your own drinks, table service and a potluck dish to share. Always a good time at Morgan Creek. Lots of prizes for winning bingo. Need to contact Julie for the equipment.

WIRE WRAP CLASS: Set up for August 17 at 6:00 pm at Hiawatha Community Center. Bring your own tools and stones to wrap. Dale will send out a picture of tools needed. **Limit to First-come–First-served 15**. Respond to either Dale or Sharon if interested. The club has worked on getting this wire wrap class lined up for at least a year or more!.

MOTION TO ADJOURN by Ray seconded by Jay. 8:50 pm meeting adjourned.

Respectfully submitted
Dell James Secretary

Not One, But Two Asteroids Might Have Ended the Age of Dinosaurs

Off the coast of West Africa, scientists think they've spotted the remains of a crater 5.3 miles wide. Named Nadir, this potential crater lies buried hundreds of feet beneath the seafloor. The team suspects that an asteroid carved out this crater around the time that another space rock slammed into modern-day Mexico. That asteroid, which left the Chicxulub crater, was thought to have created enough havoc to have wiped out all nonbird dinosaurs. The new crater finding needs to be confirmed. But if it is, that could mean that they met their demise by a one-two punch of asteroids. Around 200 craters left by asteroid impacts have been discovered on Earth. Almost all of them have been found on land. That's because impact craters at sea gradually become buried under sediment. That makes them much harder to detect. If a pockmark of this size was left by an asteroid, that space rock was probably more than 1,300 feet wide, the researchers calculate. What's more, the impact could have rocked the ground like a magnitude 7 earthquake. The collision would have also stirred tsunamis hundreds of feet high. Still, the Nadir impact would have been far less devastating than the one at Chicxulub. The asteroid that punched out the Chicxulub crater had been about 6.2 miles wide. Its impact kicked enough debris into the atmosphere to encircle the globe and dim the sun. Nadir, on the other hand, certainly wouldn't have had global effects. The ages of rock above and below Nadir offer clues to when its structure formed. It was probably about 66 million years ago, the researchers say. That's about the time that the Chicxulub asteroid struck and most dinosaurs went extinct. The Nadir asteroid may even have formed a pair with the Chicxulub asteroid, the team speculates. The two rocks could have been ripped apart by gravity while zooming past Earth on a previous loop around the sun. Confirming Nadir is an impact crater will require drilling for solid evidence. That evidence could be shocked quartz, a mineral forged by asteroid impacts. If not an impact crater, what is Nadir? Well, there are a few options. It could be a collapsed volcanic caldera, for instance. Or a squeezed body of salt called a salt diapir. Even if Nadir was made by an asteroid, that doesn't mean it helped kill off the dinosaurs. The structure's age is still uncertain. Seismic data suggest it formed around 66 million years ago or maybe a little later. Drilling in the crater for minerals that contain radioactive elements could provide a more precise date. The researchers hope to drill in 2024. That may settle some of the debate about Nadir's origins. But new questions will probably arise. If they do prove that this is the sister of the dinosaur killer, then how many other siblings are there?

https://www.snexplores.org/article/two-asteroids-ended-dinosaurs

Spotlight Gemstone: Peridot

August's birthstone, **peridot**, is gem-quality olivine, a silicate mineral with the formula of $(Mg, Fe)_2SiO_4$. As peridot is a magnesium-rich variety of olivine (forsterite), the formula approaches Mg_2SiO_4. Its green color is dependent on the iron contents within the structure of the gem. Peridot occurs in silica-deficient rocks such as volcanic basalt as well as in pallasite meteorites. Peridot is one of only two gems not formed in the Earth's crust, but in molten rock of the upper mantle. Gem-quality peridot is rare to find on Earth's surface due to its susceptibility to weathering during transportation from deep within the mantle to the surface. With a hardness of 6.5 -7, peridot is one of the few gemstones that occur in only one color: an olive-green. The intensity and tint of the green, however, depends on the percentage of iron in the crystal structure, so the color of individual peridot gems can vary from yellow, to olive, to brownish-green. In rare cases, peridot may have a medium-dark-toned, pure green with no secondary yellow hue or brown mask. Inclusions are common in peridot crystals but the variety depend on the location it is found at. Stones from Pakistan contain silk and rod like inclusions as well as black chromite crystal inclusions surrounded by circular cleavage discs resembling lily pads, and finger print inclusions. Brown Mica flakes are more evident in Arizona gems. Peridot's apple-green hue has been treasured for over 4,000 years. The Ancient Egyptians so adored Peridot that the location of its fog-shrouded volcanic mines on the Red Sea island of Zabargad were a closely guarded secret. The Romans dubbed it "*evening's emerald*" because unlike the deep-green emerald, Peridot's citrus tones remain constant even by candlelight. In the Middle Ages, Europeans adorned cathedrals with fine Peridot stones, and today many large fine peridots can be viewed in the world's museums. The largest cut peridot olivine is a 310 carat (62 g or 2.2 ounce) specimen in the Smithsonian Museum in Washington, D.C.

What in the World?

What in the World is this interesting rock specimen??

July's Photo

Last month's ***What in the World*** photo showed an Argentine paleontologist resting next to the thigh bone of *Pagitotitan mayorum,* a Cretaceous dinosaur that was the biggest animal to ever walk the Earth. The long-necked, herbivorous behemoth measured 122 feet long and weighed 70 tons. It's discovery was showcased at the World Conference of Science Journalists in 2017.

ROCK CALENDAR
CVRMS EVENTS OF INTEREST
2023

Aug. 15 — CVRMS Pot-Luck Picnic
Morgan Creek Park Shelter 6:30 pm
Rock Bingo

Aug. 17 — CVRMS Wire Wrap Class
Hiawatha Community Center 6:00 - 9:00 pm
See Page 1—Pre-Registration Required

Sept. 9 -10 — CVRMS Rock Auction
Amana RV Park and Event Center
Amana, Iowa
(see page 10 for additional information)

Sept. 19 — CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Sept. 22—24 — Geode Fest
First Christian Church Parking Lot
3476 Main Street
Keokuk, IA

Sept. 30 — CVRMS Bus Field Trip
U of Wisc. Geology Museum and Burpee Museum
(see page 11 for additional information)

Oct. 1 — Sunday at the Quarry
BMC Aggregates Morgan Quarry
4618 East Donald Road, just east of Waterloo
10:00 am — 4:00 pm

Oct. 17 — CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Nov. 21 — CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Dec. 5 — CVRMS Holiday Party
Hiawatha Community Center; Eat at 6:30 pm
Details to be announced

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.

As most of you know I am very interested in meteorites and meteorite craters (having dedicated a major portion of my career as a geologist ro studying the Manson Impact Structure in Iowa). Scientists have recovered meteorites here on Earth that have been analyzed and are interpreted as having originated on the Moon, Mars, and even several asteroids. These rocks were presumably blasted off their home worlds by the tremendous energy released during the hypervelocity impact of a meteorite. Apollo astronauts have also recovered a meteorite on the moon that was interpreted as having been blown off the Earth by such an impact. Now scientists think they have recovered a meteorite here on Earth that was also blasted off the planet by a meteor impact only to eventually return.

This Meteorite Left Earth. Thousands of Years Later, It Came Back.

14 July 2023

By FELICITY NELSON

They say what goes around comes around, but it's unlikely the saying was supposed to ever refer to meteorites. And yet here we are. Scientists are seeking to confirm that a black rock discovered in Morocco in 2018 departed Earth's pull for outer space, only to return to it like a prodigal child. If true, this rock, officially called **Northwest Africa (NWA) 13188**, would be the first meteorite (that we know about) to have made this extraordinary round trip. That this 646-gram *'boomerang space rock'* might've made a celestial excursion isn't the only strange thing about it. NWA 13188's bubbly appearance, texture of crystals, and precise chemical makeup hint strongly at the kind of rocks that form out of the molten minerals produced by volcanoes near sinking oceanic plates right here on Earth. Throw in its mix of oxygen isotopes and signature of trace elements, and it becomes highly doubtful that this rock is a meteorite. At least, not your typical space-rock variety. Yet according to Jérôme Gattacceca, a geophysicist from French National Centre for Scientific Research who presented his team's findings at the *Goldschmidt geochemistry conference* in France, the rock has had an interesting journey that has seen it spend a significant amount of time in orbit. Its concentrations of Helium-3, Beryllium-10, and Neon-21 could only be explained by exposure to cosmic rays (radiation found in outer space but largely blocked by Earth's magnetic field). While the concentration of these isotopes was lower than other meteorites, it was significantly higher than other rocks from Earth. This suggested that NWA 13188 had been exposed to galactic cosmic rays for a short but significant period, as many as a few tens of thousands of years. NWA 13188 also had a glassy 'fusion crust', suggesting it may have melted as it made a fiery entry into the Earth's atmosphere. All this *"preclude that NWA 13188 is a man-made 'fake' meteorite",* Gattacceca and his colleagues write. *"Therefore, we consider NWA 13188 to be a meteorite, launched from the Earth and later re-accreted to its surface,"* they conclude. How this Earth rock made it into space is a mystery, but it's possible it was ejected during a volcanic eruption or thrown into space when another meteorite smashed into Earth, the researchers say. To go into orbit, a rock shot from the mouth of a raging volcano would need to be moving at tens of thousands of kilometers per hour, magnitudes faster than most rocks are estimated to fly. The highest volcano plumes usually only reach around 102,000-148,000 feet above the Earth so it's unlikely that volcanoes could launch rocks into space. Some collisions between Earth and large asteroids would have been strong enough to fire rocks into the Solar System. A 4-billion-year-old Earth rock, the earliest known to science, was found on the Moon during the Apollo 14 mission in 1971. This rock was probably flung from Earth to the then much-closer Moon after an asteroid collision. The age of NWA 13188 is unknown, but Gattacceca's team is working on dating the rock by measuring the concentrations of an isotope of argon. The unpublished research hasn't persuaded everyone. *"When you're claiming extraordinary hypotheses, you need extraordinary evidence to back it up. I am still unconvinced,"* planetary scientist Philippe Claeys told Alex Wilkins at *New Scientist*. Meteorites from Mars have also been found in the Sahara desert; a 4.4-billion-year-old rock called *'Black Beauty'* was discovered by local meteorite hunters and sold to a private collection in 2011. It now has a market value of more than $10,000 per gram. The Sahara Desert is an ideal place to search for meteorites as the black stones pop against the sand, and there is little vegetation to obscure the view. As many as 780,000 meteorites could be lurking somewhere in the Sahara, making it the best meteorite-hunting location outside of Antarctica. https://www.sciencealert.com/this-meteorite-left-earth-thousands-of-years-later-it-came-back

NWA 13188.

Marine life booms with a spate of new species every 36 million years, and tectonic heaving is the indirect reason, new research has found. A deep analysis of the fossil and geological record reveals a changing sea level that occurs in response to a **36-million-year cycle of tectonic movement**. This, a team led by geologist Slah Boulila of Sorbonne University in France has found, disrupts several ecosystems, causing many species to struggle, and new ones to blossom to fill the new ecological niches that emerge. *"In terms of tectonics, the 36-million-year cycle marks alterations between faster and slower seafloor spreading, leading to cyclical depth changes in ocean basins and in the tectonic transfer of water into the deep Earth,"* says geoscientist Dietmar Müller of the University of Sydney. *"These in turn have led to fluctuations in the flooding and drying up of continents, with periods of extensive shallow seas fostering biodiversity."* A close look at the fossil record shows that biodiversity is not a nice, even constant. Instead, it fluctuates dramatically on scales of tens of millions of years, punctuated by extinction events and the rise of new species. What hasn't been clear is what drives these changes; whether each event is unique unto itself, or whether there's an underlying mechanism that links them. The research by Boulila and team was a painstaking analysis of multiple geological datasets from the past 250 million years, combined with computational simulations and modeling using tectonic visualization software called **GPlates**. Earth's crust is never still. It consists of separate tectonic plates that are constantly moving and being recycled. Places where the tectonic plates meet beneath the ocean are known as subduction zones; there, water is sucked deep under the mantle, to be spewed out later via volcanic activity. In addition, tectonic motion can cause the seafloor to spread as plates move apart from each other. Both of these mechanisms can cause variations in the sea level over long periods of time. In their data and simulations, the researchers found a cycle of 36 million years in the diversity of marine life... and this coincided with a cycle found in tectonic, sea-level, and large-scale rock layer data over the same time period. These findings, they say, constitute compelling evidence that the sea level changes triggered by Earth's tectonic cycles play a key role in biodiversity cycles and shaping ecosystems. *"This research challenges previous ideas about why species have changed over long periods,"* Müller says. *"The cycles are 36 million years long because of regular patterns in how tectonic plates are recycled into the convecting mantle, the mobile part of the deep Earth, similar to hot, thick soup in a pot, that moves slowly."* There are other triggers throughout Earth's history that can drive biodiversity. For example, the team also found evidence of a biodiversity cycle of 62 million years. This could have been driven by changes in carbon dioxide levels, but it needs to be investigated further, the researchers say. https://www.sciencealert.com/an-explosion-of-life-happens-on-earth-every-36-million-years-now-we-know-why

Scientists think they've uncovered evidence of the oldest glaciers ever found, in ancient rocks speckled with oxygen isotopes lying beneath the world's largest gold deposits in South Africa. The discovery could add new lines to an early chapter in Earth's turbulent history, and may explain how those goldfields formed. A team lead by University of Johannesburg Archaean geologist Axel Hofmann analyzed rock beds situated near Durban on the east coast of South Africa that contain glacial deposits estimated to be 2.9 billion years old, making them the oldest known on Earth. Rocks that old have had a long time to experience a variety of geological changes. Luckily the Pongola Supergroup, as the layers of rock are known, has hardly been disturbed since it was laid down with the flooding of an inland sea all those years ago. *"These deposits are fossilized glacial moraines, which are basically the debris left by a glacier as it gradually melts and contracts."* Researchers measured levels of oxygen isotopes in sandstone and shale samples from the Pongola Supergroup, finding they had the lowest levels of oxygen-18 of any similar deposits analyzed so far. They also had very high amounts of oxygen-17, indicating the rocks formed at colder temperatures. *"This means ice." "Couple that geochemical evidence with the moraine evidence, and it means glaciers – the oldest glaciers yet found on Earth."* Oxygen isotopes are stable, long-lived varieties of oxygen that are either **"heavy"** or **"light"** depending on the number of neutrons in their nucleus. When geologists compare their relative abundance in ancient rocks, they can deduce the conditions under which those rocks formed. *"As the oxygen isotopic composition of surface materials is strongly dependent on latitude and climate, we have applied triple oxygen isotope analysis to scrutinize their origin,"* the researchers wrote in their paper. The data *"indicate gradual climatic cooling of the surface environments that culminated in glacial conditions at 2.9 billion years ago."* The location of these glaciers raises interesting questions about periods of cooling in the ancient past. At least twice in its history our planet has frozen over, at a relatively recent 650 and 700 million years ago. But research questions whether this ***'Snowball Earth'*** was a completely frozen wasteland or more like a slush ball, leaving room to debate the extent to which our planet could freeze. Scientists believe that near-global glaciation may have happened on a couple of occasions in the more recent past. If so, this would be the earliest such global cooling period recorded. Another possibility is that the continent that gave rise to South Africa was closer to the poles at the time it iced over. However, geoscientists can only infer so much from the way layers of sediment and rocks are stacked on top of one another, or gouged out by ancient ice. This analysis of oxygen isotopes *"adds an entirely new line of evidence to this argument"* that what we're looking at are traces of incredibly old glaciers. In other words, we should expect these new findings will be closely scrutinized.

https://www.sciencealert.com/scientists-discover-ancient-traces-of-the-oldest-glaciers-ever-found

Dinosaurs roamed Earth for millions of years, during a major geologic era known as the Mesozoic. Fossils, scientific discoveries and tireless research efforts have gradually unveiled the mesmerizing tapestry of the dinosaur timeline. Their captivating tale begins in the Triassic period, reaches its peak during the well-known Jurassic period and comes to a dramatic end in the late Cretaceous period. Discover how each of these distinct periods served as a stage for the evolutionary dramas that unfolded, as new species emerged and others faded away.

Titanosaur sauropod during the Jurassic period.

How Long Ago Did Dinosaurs Live?

The dawn of dinosaurs began with the **Permian mass extinction**, also known as the Great Dying. This event, around 252 million years ago, killed more than 90 percent of life on Earth at the time. Scientists are unclear on what actually caused this mass die-off (warming temperatures and volcanic activity likely played a role) but it is widely recognized as the worst extinction ever to have occurred.

The Triassic Period

After this catastrophe, ecosystems changed and mammal-like reptiles came to dominate on land. This era is known as the Triassic Period. They were also accompanied by **archosaurs**, a group that included early dinosaurs. Exactly when dinosaurs emerged during this period, however, is up for debate; for some time, paleontologists believed ***Eoraptor*** was the first. A paper published in 2013, on the other hand, argued that the two-legged *Nyasasaurus,* dating back to around 243 million years ago, is actually the earliest dinosaur, or at least one of its relatives. And another fossil recently found in Africa, belonging to ***Mbiresaurus raathi***, is recorded as the continent's earliest known dinosaur and an early relative of the towering sauropods.

The Jurassic Period

At the beginning of the Triassic, Earth's landmass was one supercontinent called Pangea. As the period drew to a close and Pangea began to split in two, however, *another* mass extinction occurred. Like the previous one, the exact causes are still unknown — though a changing climate is considered a likely cause. Fortunately, dinosaurs survived. As the dinos entered the Jurassic period, Pangea's gradual separation into Laurasia in the North and Gondwana in the South coincided with cooler temperatures and increased rainfall. This spurred the growth of new vegetation, such as ferns and conifer trees. As the flora changed, dinosaurs diversified. Most striking in the Jurassic is perhaps the rise of the sauropods, such as ***Brachiosaurus*** and ***Diplodocus***. They spread far and wide, and grew to enormous sizes, feasting on the abundant plant life. Theropods, two-legged meat-eaters, also grew larger, ***Allosaurus*** and ***Ceratosaurus*** are two prominent examples. Meanwhile, iconic armored herbivores like ***Stegosaurus*** appeared on the scene, too.

The Cretaceous Period

At the end of the Jurassic, some 145 million years ago, a further shift in the continents prompted yet more flourishing dinosaur evolution. What came next is known as the Cretaceous, a period that lasted 79 million years. During this time, sauropods reached ever greater sizes and heights; one of the largest was ***Patagotitan*** (literally "*the titan from Patagonia*"), stretching to heights of more than 120 feet as it roamed the Early Cretaceous. We owe some of the most famous and largest meat-eating dinosaurs, such as ***Tyrannosaurus Rex****, Spinosaurus,* and ***velociraptor,*** to the Cretaceous, too. Dinosaurs filled all kinds of ecological niches, and some researchers believe the giant reptiles reached their peak diversity during the mid-Cretaceous period.

Why Did Dinosaurs Go Extinct?

But this success was not meant to last. Around 66 million years ago, an asteroid thought to be roughly 6 miles wide struck the Yucatán Peninsula in Mexico. This collision triggered a mass die-off that reverberated through ecosystems, wiping out all non-bird dinosaurs. Paleontologists continue to uncover new facets of dinosaur behavior, ecology and appearance through fossils, however. And much remains to be learned about how they came to rule Earth for so long. It's entirely possible that a large swathe of dinosaurs remains to be discovered. https://www.discovermagazine.com/the-scirnces/the-dawn-of-dinosaurs-to-extinction-how-long-did they-roam-earth

Nature has tried some pretty wild approaches to life's problems over the eons, and that's true for vision. One of the earliest examples of a complex eye may have relied on a rather unusual material for focusing light, one not found in modern organisms. The eyes belonged to an extinct group of animals called trilobites, and their eyes were

The eye of trilobite *Walliserops trifurcatus*, which lived in what is now Morocco over 350 million years ago.

made of hard crystal, a mineral known as calcite, a strange little quirk that gives us a window into how these early animals sensed the world around them. Trilobites died out about 250 million years ago but were around for some 300 million years before that. There are also plenty of trilobite body plans in the fossil record, which suggests that those 300 million years were very successful ones. And because their strange eyes were made of stone, they were often beautifully preserved in the many fossils they left behind. This is how we know that trilobites had compound eyes like insects, consisting of clusters of photoreception units called ommatidia, each with its own photoreceptors and lenses. Examinations of broken sections of the fossilized lenses reveal a crystalline material made of calcite. Pure calcite is transparent, so, in theory, light could penetrate it and be focused, where the photoreceptors might detect it. As with insect vision, there was likely a trade-off: Trilobites probably didn't see in high spatial resolution, but they were particularly sensitive to motion. There were three kinds of these trilobite eyes. The oldest and most common is a type known as holochroal, in which small ommatidia were covered by a single corneal membrane, with the adjacent lenses in direct contact with each other. The abathochroal eye is only seen in the family Eodiscidae; the small lenses are each covered by a thin cornea. Finally, the schizochroal eye is only seen in the Phacopina suborder. The lenses are larger, widely separated, and each has its own cornea. They were probably, scientists believe, highly specialized. The holochroal eye is the most similar to modern apposition eyes seen in some insects and crustaceans, and scientists believe they worked in a similar way. Each ommatidium operates individually, and the image the insect sees is a mosaic of all the images combined. https://www.sciencealert.com/ancient-trilobites-had-crystal-eyes-and-theyre-still-a-mystery

Earth's newest volcano has been born via a brand new volcanic fissure that opened up on Iceland's Reykjanes peninsula, spewing fountains of molten rock from the ground. The event marks the third year in a row that the underlying Fagradalsfjall lava field has erupted. The latest eruption occurred on June 10 after several days of seismic activity. Scientists have recorded more than 7,000 earthquakes in the region since July 4, the largest of

which was a magnitude 4.8 quake, according to a statement from the Icelandic Met Office. Lava is still trickling from the 1.7-mile-long fracture in the ground and flowing into a small, shallow valley to the southeast that could soon spill over. The surrounding area is uninhabited and the eruption poses no threat to infrastructure, according to the statement. If the lava flow snakes southward beyond the small valley, it could reach the Merardalir valley, which is where the last Icelandic volcanic eruption occurred on Aug. 3, 2022. The year before that also saw a dramatic eruption on the Reykjanes peninsula that broke an 870-year-long quiet period in the Krýsuvík-Trölladyngja volcanic system. Scientists detected the first signs of the latest eruption in April via a small subsistence signal, a slight sinking of the ground potentially caused by an inflow of magma. The following sequence of earthquakes, which was similar to those recorded prior to the eruptions in 2021 and 2022, alerted the researchers that another eruption could be on the horizon. Further monitoring revealed that a vertical sheet of magma, known as a "dike intrusion," was migrating upwards to the surface between the Keilir and Litli-Hrútur mountains. In 2022, the same phenomenon culminated in an eruption five days later. On July 7, researchers calculated that 424 million cubic feet (12 million cubic meters) of magma, a similar volume as in 2022 and enough to fill 5,000 Olympic-size swimming pools, was brimming less than a mile below the ground surface, fracturing Earth's crust. The magmatic dike continued to inflate and inch upward until mid-afternoon on Monday, when it finally breached the surface and emerged *"as a series of fountains,"* according to the statement. The eruption has since decreased in intensity, with fewer, smaller lava jets. Seismic activity has also subsided. Scientists are keeping a close eye on the lava flow's movements and warned that conditions can change quickly. *"The lava can cause wildfires in the area that significantly reduce air quality,"* experts wrote in the statement. *"New volcanic fissures can open without notice. Lava blocks can fall from the edge of the lava field. New lava can suddenly flow at high speeds from the edge."* https://www.livescience.com/planet-earth/volcanos/earths-newest-baby-volcano-is-painting-icelands-fagradalsfjall-region-with-incandescent-lava

A massive mountain summit crumbled around 1190 CE, leaving evidence in the plains below.

Earth is home to **14 *"eight-thousanders,"*** summits that top off at more than 8,000 meters (26,247 feet), above sea level. All of these grand mountains tower over the Himalayas, the highest place in the world. But our planet is dynamic; could there have been additional peaks like these, since lost? "*We wanted to know whether, 830 years ago, the Earth and the Himalayas had one more,"* says Jérôme Lavé, a geomorphologist at the National Centre for Scientific Research (CNRS) and the University of Lorraine in France. The answer, according to Lavé and his colleagues, appears to be yes. In a new paper, published in the journal ***Nature*** on July 6, they've found evidence of an ancient landslide that reshaped South Asia's geography, linked that to the collapse of a peak that would have once been one of the tallest mountains on Earth. Lavé says his team first spotted the fingerprints of this medieval landslide not in the Himalayas, but far to the south, near the India-Nepal border, in the flat plains around the Narayani River. To look for missing mountains, these plains are prime land for geomorphologists, scientists who study the evolution of the land under our feet (or, in this case, the land towering well above everyone but the hardiest mountaineers). Rivers like the Narayani carry sediments downslope, and those sediments can reveal much about the mountains where they originated. For instance, Lavé and colleagues found medieval sediments with a carbonate content five times higher than average. This mineral fingerprint indicated that *something* had disrupted the Narayani's flow. *"A giant landslide occurring…seemed to me the most obvious avenue to explore,"* Lavé says. They began plying uphill to find out more. The Narayani flows through the city of Pokhara, nestled in a valley less than 3,000 feet above sea level. But this is one of the steepest landscapes on Earth: looming over Pokhara is the Annapurna massif, a section of the Himalayas. (The massif's crown jewel is its tallest peak: also named Annapurna, a proud member of the eight-thousand club.) By studying images of the Annapurna massif, the team found geographic signs of an old landslide. In one subsection of the massif, called the Sabche cirque, they spotted strange features like pillars and pinnacles, markers of erosion. The authors needed more samples. Collecting fragments from the plains is one thing. It was another to gather wood and rock from the Sabche cirque; they ventured up into the massif by helicopter. From these parts, they began to build the hazy image of a mountain that existed, long ago, until one catastrophic day around 1190 CE. *"They really managed to capture this event…both at the source as well as at the far sink of these sediments,"* says Wolfgang Schwanghart, a geomorphologist at the University of Potsdam in Germany, who was not an author of the paper. This is what Lavé and colleagues think happened: There once rose a second eight-thousander from the Annapurna massif. Then, it collapsed. The resulting rockslide thoroughly eroded the Himalayan landscape and poured sediment into the valley that now contains Pokhara, from where waters carried it downstream. This event played a major role in eroding the rock, reshaping the massif closer to what we see today. The paper suggests that large, dramatic landslides may be a significant driver of erosion at high altitudes like this. "*This is a mechanism that still needs to be further investigated, but this hypothesis may open new insights,"* says Odin Marc, a geomorphologist at CNRS who was also not involved in the research. What caused the mountain to collapse isn't clear. A warming medieval climate might have melted mountaintop permafrost that otherwise strengthens the peak. Schwanghart, who has also studied the region's geology, believes the answer may be earthquakes. He says the chronology indicates that three earthquakes struck Nepal around the time that Lavé and colleagues suggested the mountain collapsed, and one of them may have caused the mountain to topple in the first place. Whatever happened, the new report reinforces the fact that mountains are constantly changing environments. We might see summits as eternal fixtures on the landscape, but if anything, they are the complete opposite. After all, Himalayan landslides aren't consigned to the past. In 2021, an avalanche and rockslide careened down a mountainside in Uttarakhand, India, around 300 miles northwest of Annapurna. The disaster burst a dam, and the resulting flood left some 200 people dead or missing. If such a rockslide were to happen to Pokhara today, the results could be devastating. Pokhara is Nepal's second-largest city (after the capital Kathmandu) and home to more than half a million people. Moreover, globally, evidence is mounting that a warming climate exacerbates the risk of mountain landslides. Just last month, the Alpine summit of Fluchthorn, nestled on the Swiss-Austrian border, abruptly collapsed in an event that scientists ascribed to thawing permafrost. Mountain collapses like these may be more common than we realize. *"In Alaska, you would find similar events—but often they go unnoticed, because there is no one around,"* says Schwanghart..

https://www.popsci.com/science/himalaya-mountain-landslide/

Cedar Valley Rocks & Minerals Society will hold its **2023 consignment Auction** on **September 9-10** 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 1,400 lots will be auctioned. **Viewing** is **Friday night Sept. 8 from 5:00 - 7:30 pm** , **Saturday morning Sept. 9** from **7:30 - 9:00 am.** and **Sunday morning Sept. 10** from **8:00 - 9:00 am**. The **Saturday Auction** runs from **9:00 a.m. to about 8:00 pm**, with **hot food available from a food truck**. The **Sunday Auction** runs from **9:00 am to about 3:30 pm,** again with **hot food available**. Cash, credit card (with small service fee) or good check is accepted for payment. Iowa sales tax of 7% is also added to all items (Bidders who provide Iowa tax permits are exempt from paying it). 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. 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 sales** 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.

FOLLOWING IS A PARTIAL LIST OF ITEMS TO BE AUCTIONED

EQUIPMENT WILL SELL AT 2:00 ON SATURDAY

ROCKS & MINERALS

AGATE: Bubblegum (SD), Botswana (some uncut), Brazilian (polished thick slabs & whole), Crazy Lace (Mexico), Fire, Graveyard Plum, Keswick, Lake Superior (several hundred lbs), Madagascar Dendritic (Mad River), Mexican, Mexican Black Lace, Mexican Moss, Montana Moss, Pidgeon Blood, Prairie (SD), Rainbow (Lge slab), Vaquilla
Afghan Lapis
Amethyst, Thunder Bay
Apache Tears (polished)
Australian Opal
Cave Stalactites
Dendritic Slabs, E. IA
Dragon Egg
Fluorescent Minerals: Calcite, Willemite, etc.
Fordite
Geode, 2 Lge, 1 Lge Snowball
Geodes, Kahoka (1 is 6")
Geodes, Keokuk, whole and cracked
Geodes, some botryoidal, some red-rind
Gold Ore
Iridescent Calcite, Knoxville IA
Jade, WY
Jasper
Kunzite
Maryellen Jasper, MN
Mexican Coconuts, some sawed and hollow
Mexican Opal: cantera, jelly, fire
Mica
Millerite, Carthage IL & Ollie
Miscellaneous slabs
Moroccan Material, polished
Ocean Jasper
Optical Quartz
Oriental Gold
Polished Stones
Quartz with MuscoviteRhodochrosite
Scepter Quartz
Selenite, Mexico
Septarian Nodules (cut, not polished)
Sodalite
Thomsonite, MN
Zeolites from India

FOSSILS

Ammonites
Coprolite
Insects
Limb Casts, Eden Valley, WY
Petrified Coral, 14"
Petrified Wood, polished slabs, Indonesia
Petrified Rainbow Sponge, WY
Petrified Wood, UT
Shark Teeth
Texas Springs Pink Limb Casts, NV
Trilobites, Morocco

JEWELRY

Bolo ties
Cabs
Faceted Stones
Findings
Miscellaneous Jewelry
Silver

EQUIPMENT (sells at 2:00 on Sat.)

Faceting Machine
Sears Craftsman Tool Cabinet
Tools
Tumbler (small, new in box)

MISC.

Books
Fossil Fish Table
Hawkeye Pearl Button Factory, (artifact), Mississippi river shellfish muscle button blanks
Iridescent shell pieces (paua?)
Plastic Bags
Polished Stones for Gem Trees
Rock & Gem magazines
Rock Bowl
Seashells
Septarian Spheres, with stands

"Bill's Big Bus Boogie" 2023
U. of Wisc. Geology Museum & Burpee Museum of Natural History

The 2023 edition of **"Bill's Big Bus Boogie"** adventure is on again after a 3-year COVID break. This year's trip will take CVMRS members on a bus field trip to the **University of Wisconsin Geology Museum** in Madison, Wisconsin, and the **Burpee Museum of Natural History** in Rockford, Illinois, on **Saturday, September 30, 2023**.






The sign-up sheet for members interested in participating in the trip will be available at club meetings. For additional information contact **Bill Desmarais** at desmarais_3@msn.com or phone **319-365-0612.**

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

2023 Bills Big Bus Boogie
will leave from Cedar Valley World Travel
6100 7th St SW, Cedar Rapids
Sat. Sept. 30 - **6:00 a.m. SHARP** and **return ~ 6:00 p.m.**
monitored parking available

additional information will appear in future newsletters.

2022 & 2023 Officers, Directors, and Committee Chairs

President	Marv Houg (m_houg@yahoo.com)	(319)364-2868
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Hospitality	Karen Desmarais (desmarais_3@msn.com)	365-0612
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. Meetings are held 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 1st Tuesday at 6:30. June, July, and August meetings are potlucks held at 6:30 p.m. at area parks on the 3rd Tuesday of each month

CEDAR VALLEY ROCKS & MINERAL SOCIETY

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

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

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

CVRMS website:
cedarvalleyrockclub.org

Next Meeting:
AUGUST 15
Morgan Creek Park
Potluck Picnic
Bingo Night
Info on Wire Wrap Class on p.1

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