Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

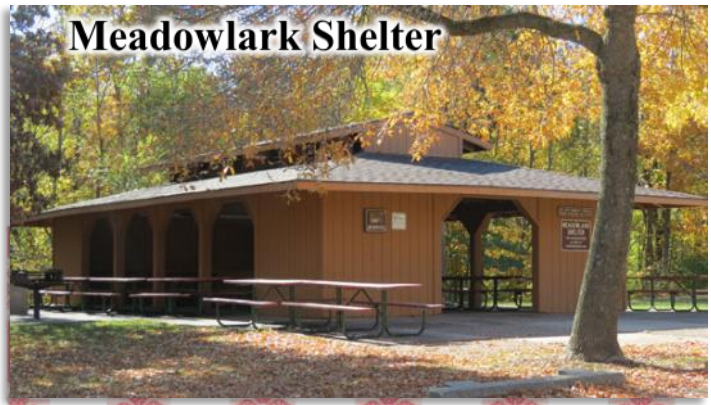
cedarvalleyrockclub.org

CEDAR VALLEY GEMS | JULY 2025 | VOL. 51, ISSUE 07

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

Next CVRMS Meeting
Tues. July 15
We eat at 6:30 pm
Potluck Picnic!

at Wanatee Park
1600 Banner Drive, Marion



Geode Cracking
Rock Identification
Rock Show & Tell
(bring some rocks to show off)

- Bring Your Favorite Dish to Share
- Bring Your Own Table Service

A Prehistoric Pompeii, Right in Nebraska

About 12 million years ago, a volcanic eruption blanketed the plains of what's now Nebraska in a thick layer of ash. But it wasn't just any eruption, it created a natural time capsule. As the ash settled, hundreds of animals perished, their bodies preserved in astonishing 3D detail beneath the surface. This haunting scene, later discovered by paleontologist Mike Voorhies and his geologist wife Jane, is now known as the Ashfall Fossil Beds, a site so eerily well-

preserved that scientists call it a *"prehistoric Pompeii."* Unlike the people of Pompeii, who died instantly, the animals here suffered a slow and painful death over days and weeks as ash filled the air and covered the land. Today, visitors to Ashfall Fossil Beds State Historical Park can witness the fossils of 17 different vertebrate species, including 5 species of horse, 3 species of camel, and even a saber-toothed deer. It's a place where time stopped, and nature kept the evidence. https://fantasticfossils.quora.com/A-prehistoric-Pompeii-right-in-Nebraska

CVRMS Picnic June17 Thomas Park, Marion

44 people attended

CVRMS Board Meeting June 24 — Minutes —

MEETING CALLED TO ORDER: 7:15 pm by Marv Houg at his house. Board members present, Jay Vavra, Marv Houg, Dale Stout, Ray Anderson, Sharon Sonnleitner, and Kim Kleckner.

SECRETARY MINUTES FROM LAST MEETING. Ray made a motion to accept, second by Kim, motion passed.

TREASURERS REPORT. Dale reported May income of $60.30 and expenses of $14,428; remaining total balance is $30,911. Kim moved for acceptances of the report, Jay seconded. Motion passed.

2026 ROCK SHOW: Theme, "***Iowa's Fabulous Fossils***". **Dealer Questionnaire** discussed with changes suggested. Discussion will be continued. **Most 2025 Show Dealers** will return. **Kim has Silent Auction items** and necklaces (to be sold at pebble pit) for show.

2025 ROCK AUCTION: Jay reported 1,195 lots accepted (Jim Balmer withdrew); 11 contracts have been received, 12 outstanding. **The valuable alligator** (in 2 large boxes) and oreodont skeleton (in matrix) will both have reserves. We will work on special advertising for these items. Tiffany may have suggestions for places to advertise. **Country Cooking** from Wellman will have their food truck there on Saturday. **Agate Dude** is collecting rocks and minerals to sell for donations to ***Toys for Tots*** campaign. We will be giving him our rock donations at the auction.

NEW BUSINESS: No new information on future Plans for the new Hawkeye Downs venue.

FIELD TRIPS: Kim moved that we increase the honorarium for quarry operators who accompany our field trips from $75 to $100, because most spend all day with members. Dale seconded, and the motion passed. **Marv discussed** our June 29 trip to Klein Quarry. We will meet at the gate at 8:30 am and enter the quarry from 9:00 to 4:00 pm. All participants must register with Marv in advance, sign required Quarry waver and Club Field Trip Protocols agreement. **Laura is still working** on arrangements for a 2025 bus trip to the Field Museum on 1st or 2nd weekend in October.

MOTION TO ADJOURN: by Jjay, second by Kim. Motion approved. Meeting adjourned at 9:25 pm.

Respectfully submitted

Ray Anderson, Acting Secretary

Bill Desmarais Presents a Dinoasaur Show and Tell at Grant Wood Elementary School

In late May Bill Desmarais presented his program ***"Track'em Down and Dig'em Up, Dinosaur Discoveries in Alberta"*** to two classes of 5th graders (about 50-60 total students) at **Grant Wood Elementary School**. The programs included a slide show and a display of real dinosaur bones, an egg, and coprolite. The teacher provided photographs of the show.

Bill discussing the upper jaw of a Tyrannosaurus Rex to the students (this is a resin cast, or Bill is very strong).

Bill describing the scapula (shoulder blade) of a dinosaur and pointing out the location of the scapula of a student.

Bill holds the cast of the metatarsals (foot bone} of a hadrosaur. Don't let this guy step on you.

A student holds an actual fossil dinosaur egg. I bet she will remember that for the rest of her life.

Spotlight Gemstone:

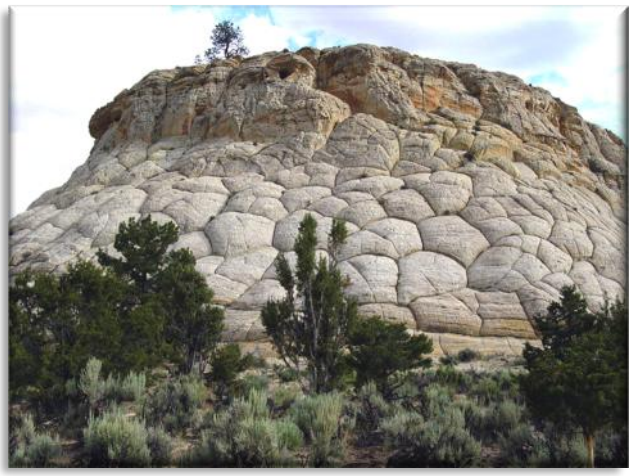
July's Birth Stone

Ruby is a pinkish red to blood-red colored gemstone, a variety of the mineral corundum (aluminium oxide). Ruby is one of the most popular traditional jewelry gems and is very durable. Other varieties of gem-quality corundum are called sapphires. Ruby is one of the traditional cardinal gems, alongside amethyst, sapphire, emerald, and diamond. The word *ruby* comes from *ruber*, Latin for red. The color of a ruby is due to the element chromium. The quality of a ruby is determined by its color, cut, and clarity, which, along with carat weight, affect its value. The brightest and most valuable shade of red, called *blood-red* or *pigeon blood*, commands a large premium over other rubies of similar quality. After color follows clarity: similar to diamonds, a clear stone will command a premium, but a ruby without any needle-like rutile inclusions may indicate that the stone has been treated. Ruby is the traditional birthstone for July and is usually pinker than garnet. The world's most valuable ruby, the 25.59-carat Burmese pigeon blood ***Sunrise Ruby***, was auctioned by Christie's in Geneva on 10 May 2023 for **$14.7 million**. Rubies have a hardness of 9.0 on the Mohs scale of mineral hardness; among the natural gems, only moissanite and diamond are harder. Sapphire, ruby, and pure corundum are α-alumina, the most stable form of Al_2O_3, in which 3 electrons leave each aluminium ion to join the regular octahedral group of six nearby O^{2-} ions; in pure corundum this leaves all of the aluminium ions with a very stable configuration of no unpaired electrons or unfilled energy levels, and the crystal is perfectly colorless, and transparent except for flaws. The red coloration in rubies is produced when slightly larger chromium atoms replace some aluminum atoms in the crystal, creating distortions that lead to absorption in the ultraviolet, violet, and yellow-green regions of the spectrum, leaving red. All natural rubies have imperfections in them, including color impurities and inclusions of rutile needles known as "silk." Gemologists use these needle inclusions found in natural rubies to distinguish them from synthetics, simulants, or substitutes. Usually, the rough stone is heated before cutting. These days, almost all rubies are treated in some form, with heat treatment being the most common practice. Untreated rubies of high quality command a large premium. Some rubies show a three-point or six-point asterism or "star." These rubies are cut into cabochons to display the effect properly. Historically, rubies have been mined in Thailand and Cambodia, as well as in Afghanistan, Australia, Brazil, Colombia, India, Namibia, Japan, and Scotland. After the Second World War, ruby deposits were found in Madagascar, Mozambique, Nepal, Pakistan, Tajikistan, Tanzania, and Vietnam.

What in the World?

This **What in the World image** is ***out of this world***. What is it and where is it?

June's Photo



June's **What in the World** photo shows the unusual polygonal fractures in the upper Navajo Sandstone (Jurassic) along the Burr Trail Road (near Boulder, Utah) in Grand Staircase-Escalante National Monument.

ROCK CALENDAR
CVRMS EVENTS OF INTEREST

2025

July 15 — CVRMS Monthly Meeting
Wanatee Park, Marion
Potluck Picnic 6:30 pm
Geode Cracking and Show and Tell

Aug. 19 — CVRMS Monthly Meeting
Morgan Creek Park, Cedar Rapids
Potluck Picnic 6:30 pm
Rock Bingo and Show and Tell

Sept. 16— CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Sept. 20-21 — CVRMS Rock Auction
Amana RV Park
See Page 10 for More Informtion

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

Nov. 18— CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Dec. 2— CVRMS Holiday Party
Details to be announced

2026

Jan. 20— CVRMS Monthly Meeting
Hiawatha Community Center 7:15 pm
Program to be announced

Ask a Geologist

by Ray Anderson aka Rock Doc , CVRMS Vice President

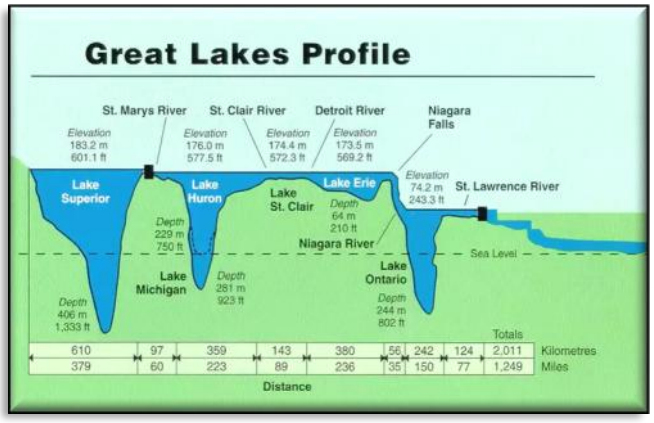
Ask a Geologist is a monthly column that gives CVRMS members an opportunity to learn more about a geologic topic. If you have a question that you would like addressed, please send it to rockdoc.anderson@gmail.com, and every month I will answer one in this column. Please let me know if you would like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

Since no one provided a question to *Ask a Geologist* this month, again I have an opportunity to include an article of interest to me. Below is a copy of an article that I read a few weeks ago that I think readers will be interested in.

What will happen if nothing is done about erosion at Niagara Falls?

What will happen if nothing is done about erosion at Niagara Falls? - Quora

Back before a lot of water was diverted for hydroelectricity, the falls receded at about **1 foot per year**, except where it met sediments and not rock. More on that later. However, at present, with less water going over the falls, it's only about **1 inch per decade**. So let's start with the source of all the water going over the falls, **Lake Erie**. Lake Erie, like the falls themselves, was formed after the last ice age as melt water from the glaciers fed into depressions in the ground, that's when all the Great Lakes were formed. **The Niagara Escarpment (in red on the map below)**, which is huge essentially forms a natural dam that holds back most of the water on top of it. Where the lake meets the Niagara River, near Buffalo, NY, the lake meets a layer of hard rock near the surface called **Lockport Dolomite**, named after the site on the Erie Canal where the canal climbs up the escarpment where it was first studied. Lockport Dolomite was formed millions of years ago when the area was covered by a shallow sea. Over millions of years most of the sediment formed sandstone, a stone that erodes very quickly. However, as the seas dried up, their salt combined with the sandstone to form Dolomite which doesn't erode at all. Seriously, the Niagara River has been flowing for thousands of years and it's barely made a dent. The Dolomite is over 30 ft thick in some places, but it hardly matters because you might lose an inch a millennium even in a fast flowing river. We get falls instead of rapids because the stone underneath the dolomite erodes quickly. The dolomite doesn't erode, but as the stone underneath it disappears, the shelf of rock that forms can't support it's own weight, it cracks and falls. The Niagara Gorge is the result of about 12,000 years of the underlying rock of the escarpment eroding and the rock on top collapsing. There are actually well over 100 waterfalls that fall over the escarpment, but they're all much smaller. The problem is that the area on top of the escarpment isn't all dolomite. In places, there are holes where sediment sits instead of hard rock. So let's talk about the **Whirlpool**. The Whirlpool started out as a tiny lake on the Niagara River. Slowly, the rock on the downstream side of the gorge eroded back towards the lake and the last rock holding the lake back fell away. It took about a day for all the sediment in the lake to be washed away, leaving the Whirlpool in its place. And the same fate awaits Lake Erie, only on a much larger scale. Lake Erie is an average of 325 feet higher than Lake Ontario. 170 feet of the drop is at Niagara Falls, and most of the rest is through rapids downstream of the falls. Once the Dolomite and sandstone is no longer in the way, Lake Erie will seek to get closer to the level of Lake Ontario, so water and sediment will rush out of the lake very quickly. It will probably take more than a day; Lake Erie is huge, so probably a year. The problem, the bottom of Lake Erie is above the top of Lake Ontario. Lake Erie is very shallow, about 230 feet deep. We can expect Lake Erie to quickly drop 180 feet down the new Niagara Gorge Rapids so it will only be about 50 feet deep and much smaller. Lake levels will continue to drop as the water further erodes the rapids. Eventually, new rapids will form in the Detroit River, which doesn't drop much now. With the drop from Lake St. Clair to Lake Erie dropping from 20 feet to closer to 200 feet, we can expect that Detroit won't be much of a river port from that point forward. The good news, there's likely to be a new Ice Age before that happens. Glaciers have a habit of making massive changes to the landscape. Nothing can or should be done to stop erosion at Niagara Falls. Erosion is a natural process. Erosion at Niagara Falls has pushed the Falls upstream for thousands of years and will continue to do so for thousands more, until the Falls no longer exist. 50,000 years from now, the falls will have moved miles upstream and be reduced to a series of rapids.



The Mystery Behind Pink Diamonds Just Got Some More Clarity

The dramatic break up of an ancient supercontinent could be behind the planet's cache of rare pink diamonds. A group of geologists and geoscientists in Australia have found that this shake-up 1.8 billion years ago was one of the key geological ingredients needed for the Earth to produce pink diamonds and why so many have been found in one particular spot in Western Australia. The findings are described in a study published in the journal *Nature* and could help the hunt for more deposits of these candy colored minerals. Diamonds are crystals of the element carbon that form deep within the Earth, where they are exposed to immense pressure and heat. They are generally brought to the Earth's surface through magma during eruptions. Scientists believe this process takes millions and even billions of years. The Gemological Institute of America estimates that all of the Earth's diamonds are billions of years old. For diamonds to turn pink, they must be subjected to the force generated by colliding tectonic plates, which bends and twists their crystal lattices the same way that it does to brown diamonds. This new study found that pink diamonds generally are found in locations where the Earth's continents were "*stretched*" when they began to break up hundreds of millions of years ago. A team of researchers from Curtin University in Perth, Australia examined the diamond-rich rocks from the Argyle volcano in the western region of the continent. A closed mine near the Argyle volcano has been home to 90 percent of the world's pink diamonds, according to mining company Rio Tinto. The stretching of landmasses when an ancient supercontinent called Nuna created gaps in the Earth's crust that the magma carrying diamonds used to rise to the surface about 1.8 billion years ago. Argyle is located right where the rest of northern Australia and the country's Kimberly region crashed together, and that collision created a scar in the Earth that will never completely heal. The team used laser beams on rocks from the Argyle deposit and found that the rocks are 1.3 billion years old, or about 100 million years older than they previously believed. *"Most diamond deposits have been found in the middle of ancient continents because their host volcanoes tend to be exposed at the surface for explorers to find,"* said the authors. *"Argyle is at the suture of two of these ancient continents, and these edges are often covered by sand and soil, leaving the possibility that similar pink diamond-bearing volcanoes still sit undiscovered, including in Australia."*

Colored diamonds from the Argyle diamond mine in Australia.

https://www.popsci.com/science/what-are-pink-diamonds/

The Great Oxygen Catastrophe: How Earth's Biosphere Was Turned Inside Out 2.45 Billion Years Ago

The Great Oxygen Catastrophe was one of the most dramatic events in the history of life on Earth. It wiped out entire groups of ancient organisms, but also paved the way for more complex, multicellular life to emerge. So what caused this biological upheaval, and what were its long-term consequences? Earth formed about 4.54 billion years ago. And just half a billion years later (around 4 billion years ago) we already find signs of organic molecules. In other words, Earth wasn't lifeless for very long. The earliest chapter of biological history is called the Archaean Eon. Life back then didn't rely on oxygen. Instead, early organisms used anaerobic chemical reactions to produce energy, processes that didn't require O_2. These primitive life forms were prokaryotes, single-celled organisms without a nucleus. Over millions of years, they evolved into bacteria, including a special type called cyanobacteria. Cyanobacteria were larger, photosynthetic bacteria that could produce oxygen as a byproduct. But they lived at the bottom of oceans, forming thin microbial mats on the seafloor, life literally lived on the bottom. At first, most microbes were anaerobic, they didn't just avoid oxygen, they couldn't survive it. Roughly 2.7 to 2.4 billion years ago, cyanobacteria began to thrive and spread rapidly. And with them, so did oxygen. Slowly but surely, this new molecule started to accumulate in oceans and eventually in the atmosphere. At a certain threshold, oxygen became too much to ignore. It was toxic to anaerobic life, and many ancient microbes began to die off or retreat into isolated niches. Meanwhile, a new kind of life emerged: aerobic organisms that could use oxygen to unlock far more energy from food. As scientists put it, Earth's entire biosphere was flipped inside out. Even after the oxygen catastrophe, levels of atmospheric oxygen were still quite low by modern standards. Carbon dioxide and hydrogen sulfide were still dominant. But even trace amounts of oxygen were enough to power a biological revolution. Fungi, large algae, and early animals like sponges appeared. Life became more diverse and structurally complex. Ozone (O_3) is made of three oxygen atoms. Thanks to the oxygen buildup, a thin ozone layer formed in Earth's stratosphere. This invisible shield blocked harmful ultraviolet radiation from the sun, the kind that can destroy DNA. Without the ozone layer, life would likely have remained trapped on the ocean floor. It was this protective bubble that made colonization of land possible millions of years later. The evolutionary arms race kicked into high gear. One of the stars of this rebirth was a small, strange animal named Spriggina. It grew no more than 2 inches long, but don't let its size fool you: this early creature may have been the ancestor of all modern multicellular animals, including humans. So the next time you take a deep breath, remember: oxygen wasn't always a friend. At first, it was a deadly intruder. But in the chaos it unleashed, it also opened the door to everything that would follow, from mushrooms to mammals to mankind.

https://popularsciencemedia.quora.com/

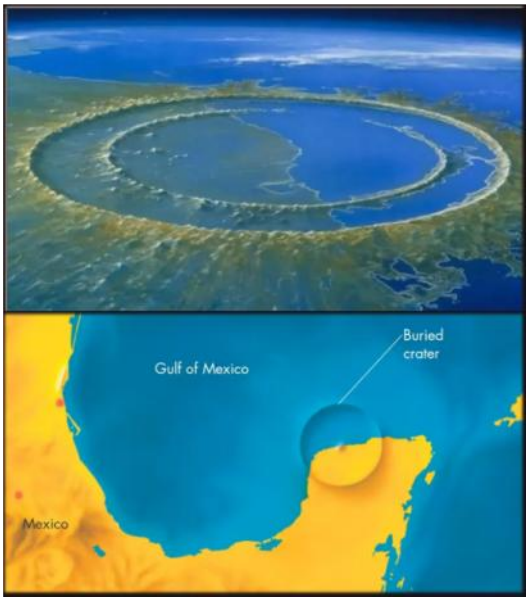
Giant 85-Million-Year-Old Mystery Sea Monster Fossil Finally Identified

Scientists have finally solved the mystery behind the identity of a prehistoric sea monster. The marine reptile, which could grow to around 39 feet long and had heavy teeth for crushing prey, was previously known from several sets of fossils unearthed over the past two decades. One key fossil was a complete but badly-preserved adult skeleton from about 85 million years ago, discovered in 1988 on Vancouver Island in British Columbia, Canada. It was thought to come from a group of long-necked reptiles known as plesiosaurs. However, until now, scientists weren't sure if it belonged to a new species or a previously discovered one. *"The identity of the animal that left the fossils has remained a mystery,"* F. Robin O'Keefe, a professor of anatomy at Marshall University in West Virginia, said in a statement. *"Our new research published today finally solves this mystery."* In a new study published May 22 in the Journal *of Systematic Palaeontology*, O'Keefe and colleagues formally classified all the fossils as ***Traskasaura sandrae***. This species is so different from other marine reptiles that researchers assigned it to a brand new genus, *Traskasaura*, within a subgroup of plesiosaurs called elasmosaurs. Elasmosaurs, like other plesiosaurs, lived throughout the Cretaceous period (145 to 66 million years ago) alongside the dinosaurs and shared the oceans with other marine reptiles, including ichthyosaurs and mosasaurs. Plesiosaurs were characterized by having small heads on long necks, broad bodies and four large, paddle-like limbs. The mythical Loch Ness Monster is usually depicted as a plesiosaur. They are thought to have breathed air and probably had to surface regularly, akin to modern-day marine mammals. The first *T. sandrae* specimen was unearthed in 1988 in the Haslam Formation on Vancouver Island, was formally described by scientists in 2002 and dates back to between 86 and 83 million years ago. Other fossils found in the same region include a right humerus and an "excellently preserved" juvenile skeleton. Although the adult specimen discovered in 1988 wasn't quite different enough from other elasmosaurs, it wasn't similar enough to any known species either. *"Relatively few characters are unambiguous on this skeleton,"* the researchers wrote in their paper. Newer fossils also had strange traits, but they weren't complete enough to confirm the possibility of a new species. The newest juvenile skeleton specimen, however, helped shed light on these ancient creatures' features, revealing that three had the same key traits. *"It has a very odd mix of primitive and derived traits — the shoulder, in particular, is unlike any other plesiosaur I have ever seen,"* said O'Keefe. After analyzing the features of all three fossil specimens, the researchers concluded that they must all belong to a new genus of elasmosaur. *T. sandrae* is thought to have at least 50 vertebrae in its neck. This adaptation may have made the aquatic predator extremely good at downward swimming and suggests that it hunted prey by diving from above. What about their diet? The ammonite molluscs that were plentiful in the oceans during the Cretaceous period are a *"good candidate — due to Traskasaura's robust teeth, ideal, possibly, for crushing ammonite shells,"* O'Keefe said. *"When I first saw the fossils and realized they represented a new taxon, I thought it might be related to other plesiosaurs from the Antarctic,"* said O'Keefe. *"My Chilean colleague Rodrigo Otero thought differently, and he was right; Traskasaura is a strange, convergently evolved, fascinating beast."* https://www.livescience.com/animals/extinct-species/giant-85-million-year-old-mystery-sea-monster-fossil-finally-identified

Two individuals of *Traskasaura sandrae* hunt the ammonite *Pachydiscus* in the northern Pacific during the Late Cretaceous. *Traskasaura sandrae*, named today in the *Journal of Systematic Paleontology*, was declared the Provincial Fossil of British Columbia in 2023.

Chicxulub Crater That Killed the Dinosaurs; Not Your Average Impact Structure

Hold onto your hats, because **66 million years ago**, Earth experienced a day that would make any disaster movie look like a lullaby. Imagine a cosmic hammer blow, an impact so monumental it carved out a scar on our planet nearly 93 miles wide, the **Chicxulub crater.** This isn't just any old pockmark; it's the smoking gun, the definitive evidence of the asteroid that famously ushered the dinosaurs into extinction. The sheer scale of this event is almost unfathomable. The crater's impressive depth, estimated at around 12 miles, speaks volumes about the energy unleashed upon impact, a force equivalent to billions of atomic bombs. This wasn't merely a bad day for dinosaurs; it was an apocalyptic transformation of Earth's climate and ecosystems. Dust and debris choked the atmosphere, plunging the planet into a prolonged darkness, halting photosynthesis, and collapsing food chains. The aftermath was a stark, dramatic reshaping of life, paving the way for the rise of mammals and, eventually, us. The discovery and subsequent study of the Chicxulub crater have fundamentally reshaped our scientific understanding of mass extinctions. It provided undeniable proof that extraterrestrial impacts can be a primary driver of widespread biodiversity loss, challenging earlier theories that focused solely on terrestrial causes. This profound realization has ignited extensive ongoing research into the intricate relationships between planetary impacts and the delicate resilience of Earth's ecosystems. Scientists now meticulously analyze the crater's structure, the geological layers surrounding it, and the fossil record to piece together the precise sequence of events that unfolded during and after the impact. The Chicxulub crater remains a pivotal focal point, not only for unraveling the mysteries of Earth's tumultuous past but also for informing our strategies for preparing for potential future cosmic threats, serving as a powerful reminder that our planet is not immune to the whims of the universe.



14,000-Year-Old Ice Age 'Puppies' Were Actually Wolf Sisters

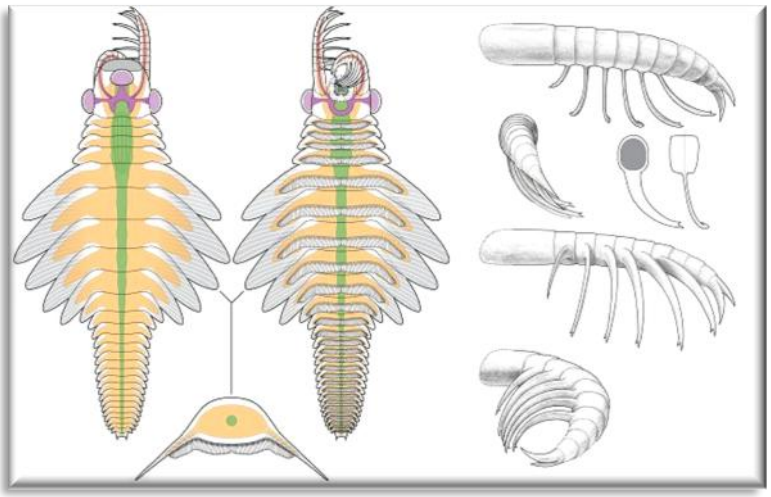
A pair of 14,000-year-old *"puppies"* found melting out of the permafrost in Siberia have undergone genetic testing, proving they were actually **wolf cub sisters** and not domesticated dogs as was previously assumed. Anne Kathrine Runge, an archaeologist at the University of York in the U.K., led an international team of researchers in analyzing the bones and DNA of the puppies. Their study, published in the journal ***Quaternary Research***, revealed that the mummified "puppies" were wolf littermates that died somewhere between 14,100 and 15,000 years ago. The remarkably preserved and mummified animal carcasses were found in 2011 and 2015 near the rural settlement of Tumat in far northern Siberia. Along with the two canines, scientists discovered woolly mammoth (*Mammuthus primigenius*) bones that appeared to have been cut and burned by humans. This archaeological evidence suggested that the canines could have been very early domesticated dogs that were seeking food from humans, such as a piece of woolly rhino meat that was discovered in the belly of one of the animals. The ice age Tumat canines were previously assumed to be among the oldest domesticated dogs in the world. But DNA testing in 2019 showed that they likely belonged to a now-extinct wolf population unrelated to today's dogs. In the new study, Runge and colleagues built on the 2019 study by analyzing genetic data from the animals' gut contents and investigated chemical *"fingerprints"* in their bones, teeth and tissue to learn more about the famous cubs. The cubs, genetically determined to be sisters, were only a couple of months old when they died, but both were eating solid food, including meat from a woolly rhino (*Coelodonta antiquitatis*) and a small bird called a wagtail. Additionally, both were still being nursed by their mother, the researchers discovered. *"It was incredible to find two sisters from this era so well preserved, but even more incredible that we can now tell so much of their story, down to the last meal they ate,"* Runge said. But there's no indication that the Tumat pups got this food directly from humans or even from scavenging humans' mammoth butchering sites. How the cubs died remains a mystery, as well. Given the cubs' lack of injuries, they may have been resting in an underground den when it collapsed, trapping them inside, the researchers wrote in the study. "*Today, litters are often larger than two, and it is possible that the Tumat Puppies had siblings that escaped their fate,*" study co-author Nathan Wales stated. ***"There may also be more cubs hidden in the permafrost."*** Additional research on the Tumat cubs may yet produce more information about ancient wolves and their evolutionary line, Wales noted in the statement. https://www.livescience.com/animals/land-mammals/14-000-year-old-ice-age-puppies-were-actually-wolf-sisters-that-dined-on-woolly-rhino-for-last-meal

Bizarre Three-Eyed Predator Hunted The Ocean Half a Billion Years Ago

Mosura fentoni possessed three eyes, grasped its prey with spiny claws, ate with a circular, tooth-lined maw, swam with the aid of flippers that lined either side of its body, and had 26 body segments, more than any other **radiodont,** the extinct group of animals to which it belonged. Luckily, it would only have been about as long as your finger, most things back then were pretty small. But its segmented tail end has fascinated paleontologists Joe Moysiuk of the Manitoba Museum and Jean-Bernard Caron of the Royal Ontario Museum, who characterized the strange beastie from its fossilized remains in the famous **Burgess Shale**. They named ***Mosura*** for its resemblance to a moth, even though the relationship is distant and tenuous. *"Mosura* has 16 tightly packed segments lined with gills at the rear end of its body," Moysiuk explained. *"This is a neat example of evolutionary convergence with modern groups, like horseshoe crabs, woodlice, and insects, which share a batch of segments bearing respiratory organs at the rear of the body."* The oceans of Earth's Cambrian period, between around **539 and 487 million years ago,** were a different place than our planet today. That was when life really took off, and the ocean started to thrive. We don't have many records of that time, but the Burgess Shale is, really, if we're being completely frank, a marvel of fossil preservation. It formed around 508 million years ago, when silty mud flowed across the seafloor, trapping and preserving a large number of organisms as it went. That mud became a fossil bed known as a **Lagerstätte**, so exceptional that fine details, soft tissue, and even internal structures were captured in the sediment. It revealed a rich ecosystem filled with mysterious creatures so bizarre that we've often been left baffled and wrong about their anatomy. In this environment lived the radiodonts, a group of animals that shared a common ancestor with arthropods, but has since gone extinct. This group includes the famous ***Anomalocaris***, a fearsome beast that could have grown up to a meter long. That might not seem very large to us, but back then, when most things were small, it was a giant. *Mosura* was not a giant, but it was one-of-a-kind, at least as far as we know. Moysiuk and Caron studied 61 fossilized individuals of the species, and characterized it in detail. *"Very few fossil sites in the world offer this level of insight into soft internal anatomy,"* Caron said. *"We can see traces representing bundles of nerves in the eyes that would have been involved in image processing, just like in living arthropods. The details are astounding."*

What *Mosura* may have looked like during its lifetime.

Of particular interest was the animal's circulatory system. It did not involve veins, as the circulatory systems of vertebrates do, but was instead open, like the circulation of modern arthropods. In crabs, spiders, insects, and other arthropods, the heart simply pumps blood (or hemolymph) into cavities in their bodies, where it swirls around their organs to perform its function. In *Mosura*, these cavities are called lacunae. They filled the creature's body, and extended into the swimming flaps that extended from each segment, visible as reflective patches in the fossils. *"The well-preserved lacunae of the circulatory system in Mosura help us to interpret similar, but less clear features that we've seen before in other fossils. Their identity has been controversial,"* Moysiuk said. *"It turns out that preservation of these structures is widespread, confirming the ancient origin of this type of circulatory system."* As for its strange, powerful respiratory system at the rear end of its body, its specialized structure suggests *Mosura* may have had unique needs. Perhaps its habitat was different from that of other radiodonts, or maybe its hunting methods required enhanced respiratory functions. This is one of those questions that is impossible to answer without more information. However, *Mosura* is a beautiful example of the strategies life adopts to thrive according to circumstance. *"Radiodonts were the first group of arthropods to branch out in the evolutionary tree, so they provide key insight into ancestral traits for the entire group,"* Caron said. "*The new species emphasizes that these early arthropods were already surprisingly diverse and were adapting in a comparable way to their distant modern relatives."* https://www.sciencealert.com/bizarre-three-eyed-predator-hunted-the-ocean-half-a-billion-years-ago



An anatomical diagram of *Mosura*, showing the nervous system in purple, the digestive system in green, and the circulatory system in orange.

Cedar Valley Rocks & Minerals Society will hold its annual 2-day consignment auction on September 20-21 at Amana RV Park.

The purpose of the auction is to help collectors or families of collectors dispose of their collections.

Knowledgeable club members act as auctioneers. Since the auctioneers are also collectors, they bid openly on material that interests them. Auctions typically attract about 100 bidders and are limited to about 1200 lots over the 2-day auction. Auction lots can be viewed from 5:00-7:30 Friday night, and before the auction at 7:30 Saturday morning and 8:00 Sunday morning. Saturday's auction runs from 9:00 a.m. to about 8:00 p.m. with hot food available during the day to 7:00 p.m. The Sunday auction runs from 9:00 a.m. to about 3:30 p.m., again with hot food available.

Cash, credit cards (with small service fee) or good checks are 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, although motel rooms are scarce in Iowa City on home football weekends). Since the auction includes multiple consigners, the order of sale rotates among the consigners. All lots are numbered, and a sheet with the order of sale for each day will be provided. Equipment will be sold at about 2:00 on Saturday.

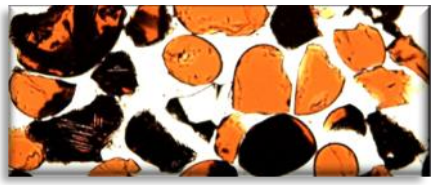
If you have a rock collection or equipment to dispose of, please contact Marv Houg or Sharon Sonnleitner. The club does all the advertising and sets up auction lots on the Friday before the auction. A 25% commission is charged for non-members, and 20% is charged for members or families of members who have belonged to the club for at least 2 years

Auction site at the Amana RV Park

Bidding at the 2024

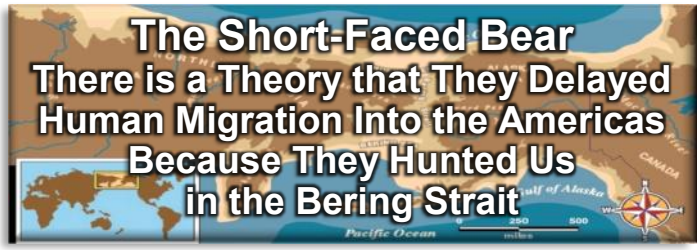
Fiery Orange Gems From The Moon Reveal Secrets of Its Violent Past

When Apollo astronauts first set foot on the lunar surface, they expected to find grey rocks and dust. What they didn't anticipate was discovering something that looked almost magical: tiny, brilliant **orange glass beads** scattered across the Moon's landscape like microscopic gems. These beads, each smaller than a grain of sand, are actually ancient time capsules from when the Moon was volcanically active billions of years ago. The beads formed some **3.3 to 3.6 billion years** ago during volcanic eruptions on the surface of the then young satellite. The story of these glass beads begins with explosive volcanic activity that would have been spectacular to witness. The beads formed when lunar volcanoes shot material from the interior to the surface, where each drop of lava solidified instantly in the cold vacuum that surrounds the moon. Picture volcanic eruptions similar to Hawaii's famous lava fountains, but happening in the airless environment of space. Without an atmosphere to slow them down or weather to erode them, these tiny glass spheres have remained pristine for over 3 billion years. For fifty years, these samples sat in laboratories waiting for technology to catch up with scientific curiosity. *"They're some of the most amazing extraterrestrial samples we have, the beads are tiny, pristine capsules of the lunar interior,"* said Ryan Ogliore, an associate professor of physics at Washington University in St. Louis. Now, researchers have finally been able to peer inside the beads using advanced microscopic techniques that didn't exist during the Apollo era. The research team used multiple cutting-edge tools, including high-energy ion beams and electron microscopy to analyze the beads without damaging them. They had to be extremely careful to protect the samples from Earth's atmosphere, which could alter the ancient minerals on their surfaces. What makes these beads so scientifically valuable is that they come in different colors and compositions, telling different chapters of the Moon's volcanic story. Some beads are shiny orange, others are glossy black, and each variety reveals information about different types of eruptions that occurred over millions of years. The minerals and isotopic composition of the bead surfaces serve as probes into the different pressure, temperature and chemical environment of lunar eruptions 3.5 billion years ago. Scientists discovered that the style of volcanic activity changed over time, providing insights into how the Moon's interior evolved. As Ogliore poetically described it, analyzing these beads is *"like reading the journal of an ancient lunar volcanologist."* Each tiny sphere contains clues about conditions deep inside the Moon during an era when our Solar System was still young and dynamic. These glass beads remind us that the Moon wasn't always the quiet, inactive world we see today. Billions of years ago, it was a geologically active place with explosive volcanoes creating these beautiful, microscopic windows into lunar history that continue to reveal their secrets to modern science. https://www.sciencealert.com/fiery-orange-gems-from-the-moon-reveal-secrets-of-its-violent-past



Microscopic views of lunar volcanic glass.

The Short-Faced Bear
There is a Theory that They Delayed Human Migration Into the Americas Because They Hunted Us in the Bering Strait



Long before humans spread across the Americas, there was a predator so massive, so powerful, that it may have hunted early humans at the Bering Strait, and delayed our migration for thousands of years. Meet the **Short-Faced Bear** (*Arctodus simus*), one of the largest carnivorous mammals to ever walk the earth. Standing over 12 feet tall on its hind legs and weighing up to 2,000 pounds, this bear was built for speed and power. It had long legs for running down prey, a short, broad snout, and a terrifyingly strong bite, perfect for cracking bones and tearing flesh. Fossil evidence suggests that Arctodus thrived in the grasslands of Ice Age North America, dominating the Bering land bridge, the only passage into the Americas. For early human bands trying to cross from Siberia into Alaska, the short-faced bear wasn't just a predator, it was an apex killer that may have hunted them, turning migration routes into deadly traps. It wasn't until the extinction of these giant bears - around 11,000 years ago - that humans could safely expand deeper into the Americas. The short-faced bear didn't just shape the ecosystem; it may have shaped the very timing of human history on this continent.

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Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:15 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 2nd 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:

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2237 Meadowbrook Dr. SE
Cedar Rapids, IA 52403

CVRMS website:
cedarvalleyrockclub.org