Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS JULY 2023 VOL. 49, ISSUE 07

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

Next CVRMS Meeting
Tues. July 18
we eat at 6:30 pm
Pot-Luck Picnic!

at Wanatee Park
(formerly Squaw Creek Park)

Geode Cracking
Rock Identification
Rock Show & Tell
Bring Your Favorite Dish to Share
Bring Your Own Table Service

What is the Hardest Material in Existence?

The hardest material in existence is not diamond, contrary to popular belief. Diamond is only the hardest naturally occurring and abundant material on Earth. There are actually six materials that are harder than diamond, according to various measures of hardness such as scratch resistance, indentation hardness and tensile strength.

Wurtzite boron nitride: This is a crystal made of boron and nitrogen atoms that has a similar structure to diamond, but is slightly harder due to its lower density. It can withstand pressures up to 18% greater than diamond.

Lonsdaleite: This is another form of carbon that has a hexagonal structure instead of a cubic one like diamond. It is formed when meteorites containing graphite hit Earth. It can resist pressures up to 58% higher than diamond.

Carbyne: This is a one-dimensional chain of carbon atoms that is extremely strong and stiff. It has twice the tensile strength and three times the stiffness of diamond. However, it is very unstable and difficult to synthesize in bulk.

Graphene: This is a two-dimensional sheet of carbon atoms that is one atom thick. It has remarkable electrical, thermal and mechanical properties. It has the highest tensile strength of any known material, about 300 times stronger than steel.

Diamond nanothreads: These are cylindrical structures made of carbon atoms arranged in a diamond-like pattern. They are thinner than a human hair but stronger than steel. They have potential applications in nanotechnology and space exploration.

Ultrahard fullerite: This is a form of carbon that consists of spherical molecules called fullerenes, which are made of 60 carbon atoms each. It is harder than diamond by a factor of 1.17 to 1.52, depending on the method of measurement.. https://www.quora.com/

New Dinosaur Joins an Illustrious, Yet Little-Understood Family

A new raptor-like dinosaur discovered in Spain helps to tell the backstory of a little-understood, semi-aquatic family of predators that likely originated in Europe, researchers have concluded. The **Spinosaurids** were a family of long, scrappy dinosaurs that branched into many different species, including the new *Protathlitis cinctorrensis*, which was believed to measure 30-35 feet long and possess long, conical teeth. Past studies have concluded that the family most likely ate fish, wading into the water like a heron, while also grabbing the occasional pterosaur, a group of flying dinosaurs. One paper said of the Spinosaurids: *"They are not as well-known as other theropod groups due to a combination of the fragmentary nature of their fossil record, mainly based on isolated elements like teeth,"* as well as their unusual skeletal structure. The most recent discovery centered on a right jawbone, a tooth and five vertebrae from the Arcillas de Morella Formation in Spain, which dates back to the Early Cretaceous period (up to 145 million years ago). The area has also yielded other dinosaur fossils. The new Spinosaurid bones dated to between 126 and 127 million years ago and helped to flesh out the Spinosaurid family tree, alongside better-known species such as the titanic *Spinosaurus* and the smaller *Baryonyx*. The new species also marks the identification of a new genus, *Protathlitis*, which means "*champion*" in Greek, after a European soccer team, Villarreal C.F., that won the UEFA Europa League title in 2021. *Cinctorrensis* honors the town, Cinctorres, located near the dig site. Tracing how Spinosaurid dinosaurs spread around the world has proven complicated thanks to how continental drift has changed the face of the Earth over the past 150 million years. The new study proposes that Spinosaurids appeared in present-day Europe and diversified there into two sub-families, Spinosaurines and Baryonychines. At this time, Europe belonged to the larger northern continent of Laurasia, and the Spinosaurids somehow migrated from there to present-day Africa, part of the Gondwana continent. Over time, the Spinosaurines took over Africa, whereas the Baryonychines became more prevalent in Europe. Spinosaurids also spread to land that became South America, South Asia and the U.K., where they left behind the teeth now most commonly used to identify them. Paleontologists have debated exactly how aquatic the largest Spinosaurid, Spinosaurus, was and whether it ambushed prey underwater or simply waded in to grab fish like a crocodile. Recent research has taken up the latter argument: *"This is simply not an animal that in your wildest dreams would be dynamic above water as a swimmer much less underwater,"* says Paul Sereno, a professor of organismal biology and anatomy at the University of Chicago.

Protathlitis cinctorrensis

https://www.discovermagazine.com/the-sciences/new-dinosaur-joins-an-illustrious-yet-little-understood-family

CVRMS Board Meeting June 27 — Minutes —

MEETING CALLED TO ORDER: by Marv. All board members present.

MINUTES FROM PREVIOUS BOARD MEETING:. Motion to approve by Bill second by Jay. Minutes accepted as published.

TREASURER'S REPORT: by Dale. Checking account balance $8,932.43. Motion to accept by Ray second by Jay. Report accepted.

ROCK SHOW 2024: Suggestions for next show in 2024. General discussions about possible themes. Board suggestion "***corals"*** will be discussed at next picnic.

ROCK AUCTION 2023: Jay reported that 6 contracts outstanding. Marv will call them this week.

FIELD TRIP: July 8 Wendling's Tama Sand Pit. Will be limited to 25 people and ask that at least half are experienced rock hunters. Dale will send notification of times, directions, etc. **Bill made a motion** that nonmembers who host our field trips be *thanked* with a $75.00 stipend. Discussion followed that this would allow the (e.g) Wendling employee be paid to cover time, etc. Matt 2nd. Motion passed

501C STATUS: No change

PAUL GARVINS *MINERALOGICAL RECORDS*: Very scientific. Give them away. Find someone who wants them.

TABLE COVERS: Sharon handling them.

FIELD TRIP AND SPEAKER EXPECTATIONS: Kim is working on. Show/auction advertising. Dell listed the show/auction on *Rock and Gem*.

PLASTIC MEMBER NAME TAGS: Ray could not identify a source. Dale will contact Waterloo Club for information on where they get theirs.

WIRE WRAP WITH SARA WEHAGE: Anyone participating will be expected to bring their own tools and stones to wrap. Dale will send out the emails regarding the classes. Class will be limited to 15 people. Scheduled August 17 at Hiawatha Community Thursday 6:00p.m.

FACEBOOK: One issue that involves a nonmember.

JULY PICNIC, WANATEE PARK: Geode cracking. Bring your own or Marv will have some to share.

THANK YOU NOTES: Cornell, VAST, U of I and donations for scholarships much appreciated.

MOTION TO ADJOURN: by Jay and 2nd by Bill. 8:20pm Meeting adjourned

Respectfully submitted
Dell James Secretary

Members' News

Last month CVRMS Board Member **Kim Kleckner** presented programs on ***rock hunting and fossils in Iowa*** to children at the Hiawatha Day School/Kindercare and at the Cedar Rapids Day School/Kindercare. **Good work, Kim!!**

CVRMS Board Member **Matt Burns** struck *rockhound gold* at a recent club field trip. Mark landed two ***"Laker Lunkers"*** when he found two large Lake Superior Agates.
The **largest** of his Lakers is 5"x4.5"x3" and weighs 2lb 11oz.

Matt cut and polished the **second one**, which is 4.25"x3.5"x3" and weighs 1lb 11.5oz. It has a dark translucent brown color with many light green bands around a center featuring crystalline quarts surrounded by brownish matrix rimed in a layer of quartz druse with crystals growing inward. A very unique and beautiful find. **Good eye Matt!!**

Spotlight Gemstone: Ruby

Ruby (Al_2O_3:Cr) is the most valuable variety of the corundum mineral species, which also includes sapphires. Rubies can command the highest per-carat price of any colored stone. This makes ruby one of the most important gems in the colored stone market. In its purest form, the mineral corundum is colorless. Trace elements that become part of the mineral's crystal structure cause variations in its color. Chromium is the trace element that causes ruby's red, which ranges from an orangey red to a purplish red. The strength of ruby's red depends on how much chromium is present—the more chromium, the stronger the red color. Chromium can also cause fluorescence, which adds to the intensity of the red color. The most renowned rubies, like those from Myanmar, the Himalayas, and northern Vietnam, typically form in marble. They're found in layers that are distributed irregularly within the surrounding marble. Marble forms as part of the metamorphic (rock-altering) process, when heat and pressure from mountain formation act on existing limestone deposits. Marble has low iron content, so the rubies that originate in marble (called "marble-hosted" by gemologists) lack iron. Because of this, many have an intense red color. In addition, rubies found in marble typically fluoresce red under ultraviolet light—even the ultraviolet light in sunlight. Fluorescence can make a ruby's color even more intense and increase its value. In other locations, rubies can be found in basalt rocks. Rubies from these sources can have higher iron content, which can make the rubies darker and less intense in color. Higher iron content in the chemical makeup of a ruby can also mask the red fluorescence, eliminating that extra glow of red color seen in marble-hosted rubies. Historically, rubies have also been mined in Thailand, in the Pailin and Samlout District of 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, Nepal, Pakistan, Tajikistan, Tanzania, and Vietnam. The Republic of North Macedonia is the only country in mainland Europe to have naturally occurring rubies. They can mainly be found around the city of Prilep. Macedonian rubies have a unique raspberry color. The ruby is also included on the Macedonian coat of arms. A few rubies have been found in the U.S. states of Montana, North Carolina, South Carolina and Wyoming. https://www.quora.com/What-are-some-historical-records-of-the-reversal-of-the-Earths-magnetic-field

What in the World?

What in the World is the big rock that this young man is resting on??

June's Photo

Last month's ***What in the World*** photo was a polished slab of a Rhodochrosite stalactite, mined in 1980 at the Capillitas Mine. Argentina.

The rhodochrosite is an epithermal mineral related to Miocene-Pliocene volcanism hosted in Paleozoic granite. The Capillitas Mine deposit includes a set of hydrothermal veins of high to intermediate sulphidation, located in Miocene effusive rocks (rhyolites, dacites, lapillitic tuffs, rhyolitic and trachytic dikes, and basaltic dikes) corresponding to the Farallon Negro Volcanic Complex, and in Peraluminous granitic rocks, Ordovician to Silurian, of the Capillitas batholith.

ROCK CALENDAR
CVRMS EVENTS OF INTEREST
2023

July 18 — CVRMS Pot-Luck Picnic
Wanatee Park Meadowlark Shelter 6:30 pm
Geode Cracking

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
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. 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 7:15 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.

The story of ancient Egyptian artifacts found in a cave in the Grand Canyon has been around for a long time. I recently ran across this article on the Egyptian artifacts and though you might enjoy it. I had to cut a portion of this article to fit on the page, so if you find it interesting I encourage you to read the entire article, referenced below.

No, Egyptian Artifacts Were Never Found in the Grand Canyon

by Alex Orlando May 29, 2023

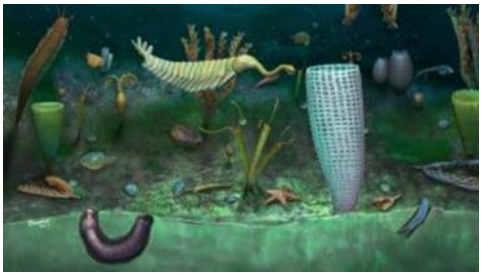
On April 5, 1909, a newspaper called the *Arizona Gazette* published an article on the front page of its evening edition. The story, **"Explorations in the Grand Canyon,"** was filled with wild claims that remnants of an Egyptian civilization had been discovered within a massive cave in the Grand Canyon's cliffs. Perched 2,000 feet above the Colorado River, the chambers of this ***"underground citadel"*** were littered with artifacts, hieroglyphics and even mummified remains, possibly of Egyptian descent. There's just one catch: The story is **unequivocally false**. Yet, despite being more than 100 years old, the tales sparked by the hoax article continue to circulate today. (In recent years, they've been given new life on social media) The Smithsonian Institution, who supposedly sponsored the expedition, has even been inundated with inquiries about it over the years, despite the fact that the investigation in question **never took place**. The Grand Canyon urban legend has been discussed in countless blog articles and several books, promoted by the History Channel show ***America Unearthed*** and floated as an intriguing possibility on *The Joe Rogan Experience* podcast. When the story's seeds were first planted in the *Arizona Gazette* over a century ago, the article, written by an anonymous author, purported that Smithsonian-funded explorer G.E. Kinkaid, under the guidance of a professor named S.A. Jordan, had made a history-defining find. "[It was] *not only the oldest archeological discovery in the United States," the article read, "but one of the most valuable in the world." However, in* 2000, a representative for Smithsonian Institution, not *Institute* as it's inaccurately named in the *Gazette* article, affirmed their position that the story was, in fact, a hoax. *"The Smithsonian's Department of Anthropology has searched its files without finding any mention of a Professor Jordan, Kincaid or a lost Egyptian civilization in Arizona,"* the representative wrote. Haley Johnson, president of the Grand Canyon Historical Society, also spoke to the inconsistencies in the original article. *"The images alone are obvious fakes,"* she says. The *Coconino Sun* in Flagstaff, Arizona, pointed to a likely culprit behind the hoax story: Joe Mulhattan, a traveling salesman who became famous in the 1870s and 1880s for deceiving newspapers into publishing fake articles. "Joe Mulhattan is known in every city in the United States and has probably caused more trouble in newspaper offices than any other man in the country," *The New York Times* wrote in 1891. *"His wild stories, written in the most plausible style, have more than once caused special correspondents […] to hurry from coast to coast to investigate some wonderful occurrence which only existed in the imagination of the great liar."* In the late 19th and early 20th centuries, **yellow journalism** was widespread; the controversial style of newspaper reporting presented hyperbolic, sensationalized stories as objective fact, often as a way to gain readers and boost circulation. Even still, the *Gazette* story quickly faded into obscurity after its initial run. But it was revived decades later in 1962, when it was featured in *Arizona Cavalcade,* a book collection of newspaper clippings from Arizona's early history. Then, in 1992, it was rescued from the historical dustbin once again when it was included in *Cities of North and Central America,* in which author, and pseudoscience proponent, David Hatcher Childress personally explored the alleged occult origins of various archeological sites in America, including the Grand Canyon Egyptian cave. What's more, according to Childress, the fact that the Smithsonian wasn't able to confirm the existence of either Jordan or Kinkaid was proof that the organization was involved in a conspiracy to suppress the truth. From there, other theories, including some that expanded upon the **Smithsonian cover-up** angle, blossomed and spread across the internet. Despite attracting the attention of occult enthusiasts and internet conspiracy theorists alike, it's not hard to spot other falsehoods and logical inconsistencies in the Egyptian cave story. For starters, says Johnson, the remote nature of the Grand Canyon would have made it incredibly difficult to access without technical gear or ladders. *"Not to mention it would have been impossible to haul all those supposed 'artifacts' into such a remote and inaccessible cave without a helicopter,"* she adds. *"Even a helicopter wouldn't be able to access many of the Grand Canyon's caves directly due to the nature of the impassible cliffs."* Beyond that, the story itself contributes to the erasure of the Native Americans indigenous to North America who lived in the region for thousands of years, in this case the **11 tribes** with historic connections to the resources and lands found within Grand Canyon National Park. "If *there was some massive influx of Egyptian rulers and laborers, wouldn't the Indigenous tribes know?*" says Johnson. *"Wouldn't their oral histories, pictographs and petroglyph panels, that dot the landscape like freckles, depict this sort of world-changing event?*" https://www.discovermagazine.com/planet-earth/no-egyptian-artifacts-were-never-found-in-the-grand-canyon

"Curious Marie" Meteorite Reveals Clues About a Rare Element in the Early Solar System

Scientists from the University of Chicago have discovered evidence in a meteorite that a rare element, **curium**, was present during the formation of the solar system. The findings finally end a 35-year-long debate and will likely change our current theories on how stars produce elements. *"Curium is an elusive element. It is one of the heaviest-known elements, yet it does not occur naturally because all of its isotopes are radioactive and decay rapidly on a geological time scale,"* said the study's lead author, François Tissot, at the Massachusetts Institute of Technology. Despite this, Tissot and colleagues found evidence of curium in an unusual ceramic inclusion they called ***Curious Marie***, taken from a carbonaceous meteorite. Curium was incorporated into the inclusion when it condensed from a gaseous cloud that formed the sun early in the history of the solar system. Curious Marie and curium are both named after Marie Curie, a pioneer in the theory of radioactivity. Curium was discovered in 1944 by Glenn Seaborg, who bombarding atoms of plutonium with alpha particles and synthesized a new, very radioactive element. On Earth, curium only exists when it is manufactured in laboratories or as a byproduct of nuclear explosions. However, curium could have been present in the early history of the solar system as a product of star explosions that happened before our solar system was born. The possible presence of curium in the early solar system has long been exciting to cosmochemists, because they can often use radioactive elements as chronometers to date the relative ages of meteorites and planets. The longest-lived isotope of curium (247Cm) decays over time into an isotope of uranium (235U). Therefore, a mineral or rock formed earlier in the solar system, when more 247Cm existed, would contain more 235U than a younger mineral. The idea is simple enough, yet, for nearly 35 years, scientists have argued about the presence of 247Cm in the early solar system. Previous studies conducted in the 1980s found large excesses of 235U in meteoritic inclusions they analyzed, and concluded that curium was very abundant when the solar system formed. However, more refined experiments conducted later showed that those results were misleading. So, scientists waited until 2010, when higher-performance mass spectrometers were developed in order to identify any small excesses of 235U. *"That was an important step forward but the problem is, those excesses were so small that other processes could have produced them,"* Tissot noted. However, models predicted that curium, if present, was in low abundance in the early solar system, so the excess 235U produced by the decay of 247Cm would not be seen in minerals that contain average amounts of natural uranium. One of the challenges was to find a mineral likely to have incorporated a lot of curium but containing little natural uranium. http://thescienceexplorer.com/universe/curious-marie-meteorite-reveals-clues-about-rare-element-early-solar-system

462-Million-Year-Old Fossilized Eyes and Brains Uncovered in 'Secret' Welsh Fossil Site

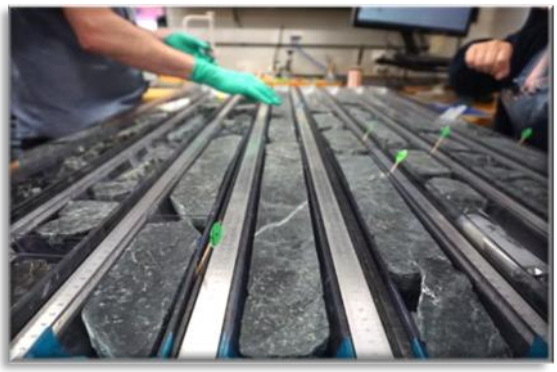
An "extraordinary" secret fossil spot in Wales contains the preserved eyes and brains of 462 million-year-old creatures hidden amidst a hoard of unknown species, a new study finds. Last year, weird **"bramble snout" fossils**" were documented at the site called "**Castle Bank,**" but new research published May 1 in the journal *Nature Ecology and Evolution* describes the whole fossil deposit. Hosting a myriad of soft-bodied marine creatures and their organs, which are scarcely preserved in the fossil record, the site resembles the world-renowned Cambrian deposits of Burgess Shale in Canada and Qingjiang biota in China. The rocks of Castle Bank, however, are 50 million years younger and give researchers a unique window into how soft-bodied life diversified in the Ordovician Period (485.4 million to 443.8 million years ago). Researchers believe they've recovered more than 170 species from the site, most of which are new to science. These include what appear to be late examples of Cambrian groups, including the weirdest wonders of evolution, the nozzle-nosed opabiniids, and early examples of animals that evolved later, including barnacles, shrimp and an unidentified six-legged insect-like creature. The rocks are also home to the fossilized digestive systems of trilobites and the eyes and brain of an unidentified arthropod, as well as preserved worms and sponges. The authors discovered the site near their home in Llandrindod Wells during the 2020 COVID-19 lockdown. The exact location is a secret for the site's protection and by request of the landowner, but the authors describe it as a small quarry within a sheep field. They spent more than 100 days at the site, carefully extracting the fossils as the landowner's sheep watched them work. The independent researchers used crowdfunding to buy a microscope to study the fossils in more detail, many of which were at most 0.1 inch long. They then teamed up with an international team of colleagues to complete the newly published research. The ecosystem preserved at Castle Bank may have been a nursery for young animals, with only juvenile examples of the most common trilobite species, named *Ogyginus corndensis,* found at the site. However, the study authors also noted that the small size of the fossils, in general, was "striking" and may simply be a feature of the community of animals that lived there. https://www.livescience.com/planet-earth/fossils/462-million-year-old-fossilized-eyes-and-brains-uncovered-in-secret-welsh-fossil-site



A reconstruction of the Castle Bank fossils.

In a Geologic Triumph, Scientists Drill a Window into Earth's Mantle

At an underwater mountain in the middle of the Atlantic Ocean, scientists **including University of Iowa Geology Professor Mark Reagan** have drilled nearly a mile beneath the ocean floor and pulled up an unprecedented scientific bounty, pieces of Earth's rocky mantle. The record-breaking achievement has electrified geoscientists, who for decades have dreamed of punching through miles of Earth's crust to sample the mysterious realm that makes up most of the planet. The heat-driven churn of the mantle is what fuels plate tectonics in the crust, giving rise to mountains, volcanoes and earthquakes. The new expedition, by an ocean drilling vessel called the JOIDES Resolution, did not technically drill into the mantle, and the hole isn't the deepest ever drilled beneath the ocean floor. Instead, researchers cruised to a special ***"tectonic window"*** in the North Atlantic where drills don't have to tunnel as far to strike pay dirt. Here, the rocks of the mantle have been pushed close to the surface as the ocean floor slowly pulls apart at the nearby Mid-Atlantic Ridge. On May 1, they began drilling the hole, known as **U1601C**. Andrew McCaig, the expedition's co-chief scientist, expected to make a shallow *"pinprick"* because the record for drilling in mantle rock, set in the 1990s, was a mere tenth of a mile. The researchers hoped to recover enough samples to help elucidate how chemical reactions between mantle rocks and water could have given rise to life on our planet. But ocean drilling can be an uncertain enterprise, drills get stuck, or the long cores of rock being recovered may be only partial samples. This time, though, the drill yielded tube after tube of dark rock, many of them surprisingly complete. *"It just kept going deeper, deeper and deeper. Then everyone in the science party said, 'Hey, this is what we wanted all along. Since 1960, we wanted to get a hole this deep in mantle rock,'"* McCaig said, speaking from the JOIDES Resolution minutes before another long section of dark rock was pulled on board. When the team stopped drilling on June 2, they had taken rock samples from as deep as 4,157 feet below the seafloor. *"We've achieved an ambition that's been feeding the science community for many decades,"* McCaig said. Scientists on land have been eagerly keeping tabs on the expedition, anticipating a jackpot of data that will open a new window into the deep Earth and fuel years of research. *"We are just to the moon with excitement about what they've got, an amazing section of rocks,"* said Andrew Fisher, a hydrogeologist at the University of California at Santa Cruz. The mantle generally begins about five miles beneath the ocean floor and roughly 20 miles beneath the continents. The mantle isn't a complete unknown. Occasionally, volcanic eruptions spew out bits of it, chunks of greenish peridotite, the type of rock that dominates the upper mantle, embedded in basalt rock. But these samples, called mantle xenoliths, have their limits, because they are often chewed up and weathered from their trip to the surface. There are also ophiolites, sheets of oceanic crust tinged with some of the upper mantle that were uplifted and plastered onto the land. But they too have been altered by the trip. What scientists have long craved was a drilled sample of mantle rock. Project Mohole, a famous ocean expedition, set out to drill through the thinner crust on the ocean floor to reach the mantle in 1961 but failed. Portions of the ocean floor where the mantle is closer to the surface seemed like an opportunity to take a sample without the technical difficulties of drilling through miles of crust. That's where the scientists aboard the JOIDES Resolution set their sights for one of the vessel's last missions before its scheduled retirement in fiscal year 2024. The team departed Ponta Delgada in Portugal's Azores Islands in April and headed to the Atlantis Massif, an underwater mountain about the size of Mount Rainier. Its primary mission was to sample rocks for clues about how, in the absence of life on infant Earth, small organic molecules might have formed as rocks reacted with water. *"This could be a way that you go from just having basically water and rock,"* said Susan Lang, the co-chief scientist of the expedition. *"That produces hydrogen, [and] that hydrogen is a really big fuel to things like the formation of smaller organic molecules, and that can then combine with other organic molecules and lead to early life."* The rock cores extracted from hole U1601C are dominated by peridotite, the most common type of rock found in the upper mantle. The samples have been altered by their exposure to seawater, and scientists are already beginning to debate how to interpret the findings. Most of the mantle is buried beneath the crust, not exposed to the ocean the way it is at this site. That raises the fundamental question: How closely do the latest samples mimic the rest of the mantle? Do the rocks truly represent mantle, or are they lower crust? And for that matter, is the boundary between mantle and crust a sharp boundary, or more of a gradual transition? The samples aren't pure peridotite, and that could be a key piece of evidence. *"It's a bit of a hash, but that's maybe what the lower crust is," Fisher said, listing off various types of rock that have been reported in daily science logs. "This is really unusual — more than a kilometer of highly altered, lower crustal and/or upper mantle rock. I'd say it's a mix."* The scientists have been so busy processing the enormous volume of rock they've recovered that they've had little opportunity to study the samples in detail, or even reflect on the magnitude of the achievement. The drill bits need to be switched out every 50 hours. The team aboard works in 12-hour shifts, not wasting a minute of time. *"The deeper we get in there, the closer we're getting to what those rocks look like, closer to what the mantle looks like,"* Warren said.



Researchers aboard the JOIDES Resolution saw the rock cores in half, creating a resource for future study

https://www.washingtonpost.com/science/2023/06/06/drill-earth-mantle-rocks/

The Proto-Mammal That Stalked a Dying World

About 250 million years ago, widespread volcanic eruptions changed the earth's atmosphere and thus its climate, setting off *"The Great Dying,"* otherwise known as the **Permian extinction**. Some nine out of 10 species disappeared over the course of about a million years, during which herbivores and predators alike jockeyed for resources, including the formidable ***inostrancevia.*** A saber-toothed meat-eater that likely had tough skin like a rhino and ran on all fours, the *inostrancevia* was the largest gorgonopsian, a group of proto-mammals that served as top predators in the years before the dinosaurs. Scientists thought *inostrancevia* had only lived in modern-day Russia, but the discovery of new fossils in South Africa means it must have migrated 7,000 miles across the supercontinent Pangaea to reach a new home. The researchers aren't sure why *inostrancevia* traveled so far from its original habitat, or how long the migration took. *"The fossils themselves were quite unexpected,"* says co-author Pia Viglietti, a research scientist at the Field Museum in Chicago. When *inostrancevia* arrived in South Africa's Karoo Basin, it would have encountered few competitors as most had already gone extinct, long before most other species. After leaving a fossil record, *inostrancevia* died out, too. Overall, the top predator role in the basin changed four times in less than 2 million years around the Permian extinction, *"which is unprecedented in the history of life on land,"* said co-author Christian Kammerer, a research curator of paleontology at the North Carolina Museum of Natural Sciences. *"This shows that the South African Karoo Basin continues to produce critical data for understanding the most catastrophic mass extinction in Earth's history,"* said co-author Jennifer Botha, a professor at the Evolutionary Studies Institute. The Basin also sheds light on how predators go extinct in the modern world, where natural ranges often shrink due to human encroachment. *"Think about wolves in Europe or tigers in Asia, species which tend to be slow to reproduce and grow and require large geographic areas to roam and hunt prey,"* says Kammerer. *"Apex predators in modern environments tend to be among the first species that are locally extirpated."* No one knows for sure whether gorgonopsians had fur or reptile-like skin, though they are believed to have hunted reptiles, especially pareiasaurs, the largest lizards that lived during the Permian. *Inostrancevia* also ate dicynodonts, smaller, pig-like relatives of theirs in the gorgonopsia clade. Scientists have classified the four-legged predators as therapsids, along with the creatures that evolved into modern-day mammals. But *inostrancevia* most likely reproduced by laying eggs.

A hulking *inostrancevia* scares off the much smaller *cyonosaurus*

https://www.discovermagazine.com/the-sciences/the-proto-mammal-that-stalked-a-dying-world

Ground Beneath Italy's Awakening "Supervolcano" Rose 66 Feet Before Its Last Eruption

The ground around Italy's awakening supervolcano rose by up to 66 feet before its previous eruption, a new study has revealed. In 1538, the ground below **Campi Flegrei**, near Naples, swelled to a breaking point then burst, burying the Roman-era village of Tripergole beneath a torrent of muddy ash and lava that became a new mountain, Monte Nuovo. With the volcano showing renewed signs of restlessness, scientists behind a new study sought to better understand what happened during the volcano's most recent historical eruption. They published their findings June 16 in the journal *Geophysical Research Letters*. *"Today the ground deformations associated with volcanic activity are monitored both with satellites and with detection networks installed on the ground,"* said lead author Elisa Trasatti. **Campi Flegrei** (which means "*burning fields*" or "*fiery fields*") is a sprawling, mostly-hidden network of 24 craters and edifices that stretch from its vast caldera opposite Mount Vesuvius at the western edge of Naples, into the nearby Gulf of Pozzuoli. More than 1.5 million people live above the vast underground volcano complex, and half a million people have their homes inside its 7 mile long caldera, which was formed after an enormous eruption 39,000 years ago. The volcano has been stirring since the mid-20th century, with bursts of heightened activity in the 1950s, 1970s and 1980s. Another period of unrest began in 2005 that is still ongoing. Since then, the ground below Pozzuoli, a town located on the volcano's roof, has risen by **4 inches each year**, adding up to a **13 foot change in elevation since the 1950s.** Campi Flegrei is also experiencing persistent small earthquakes, with more than 600 detected in April, breaking its largest monthly total ever recorded in the region. To better understand the volcano's present rumblings, scientists turned to its past; feeding data from geological, archaeological and historical sources into a mathematical model that estimated the flows of magma below Campi Flegrei's surface. It emerged that the eruption was preceded by an intense deformation of the ground which first concerned the area of Pozzuoli, then localized in the area of the future eruptive vent, reaching an elevation of 20 meters. Volcanic gas had seeped into the crust deep beneath Campi Flegrei's surface, causing it to stretch, warp and slip, unleashing earthquakes. Once enough gas had accumulated, the crust ruptured, sending a column of magma from 4 miles deep bursting to the surface The eruption was then followed by a period of ground subsidence and another of renewed uplift, before the volcano finally grew dormant until the 20th Century. If Campi Flegrei were to reenact its largest known eruption 39,000 years ago, it could send molten rock and volcanic gases high into the stratosphere, unleash tsunamis 100 feet high and spread a plume of sulfur and toxic ash that could plunge Earth into global winter for years, killing crops and causing mass extinctions. Yet the researchers found that blasts from Campi Flegrei needn't always be quite so cataclysmic. Just one hundredth of the magma that had accumulated inside the volcano prior to the 1538 eruption burst to the surface; meaning that eruptions can easily peter out without the volcano tapping into its full destructive power.

https://www.livescience.com/planet-earth/volcanos/ground-beneath-italys-awakening-supervolcano-rose-66-feet-before-its-last-eruption

The Jade Deposits in Canada

Jade is a commercial term encompassing green, white, black or yellow-brown material that consists either of Na-rich pyroxene **(jadeite)** or prismatic to acicular amphiboles of the tremolite-actinolite series that form bundles that are randomly oriented and interlocked **(nephrite).** Nephrite is tougher (harder to break) than jadeite material. Its fracture strength is about 200 MN/m2 whereas that of jadeite is about 100 MN/m2. On the other hand, jadeite material is harder (7 compared to 6.5 on the Mohs scale). Jade was first identified in Canada by Chinese settlers in 1886 in British Columbia. At this time jade was considered worthless as they were searching for gold. Jade was not commercialized in Canada until the 1970s. The mining business Loex James Ltd., which was started by two Californians, began commercial mining of Canadian jade in 1972. There are over fifty known nephrite occurrences in British Columbia. These are located in the Cassiar, Cry, and Dease Lake, and Mount Ogden areas, as well as in Southern British Columbia. These occurrences consist of individual blocks, boulder fields, talus blocks, and in situ occurrences. Most of the in situ occurrences are lens or cigar shaped. They occur at or near the contacts of **ultramafic/mafic rocks** (mainly serpentinites) with cherts, and other metasedimentary or igneous felsic rocks of oceanic terranes such as the Cache Creek (Mississippian to Jurassic) and Slide Mountain (Devonian to Permian) terranes. These contacts are commonly interpreted as shear/fault related. In general, it is believed that the British Columbia nephrite formed by metasomatic exchange between ultramafic and silica-bearing rocks. **Impurities** in the nephrite are spinel group minerals (*chromite, magnetite, picolite*), *diopside, uvarovite, titanite, chlorite,* and *talc.* Until the 1960s, almost all of the nephrite produced in British Columbia came from secondary deposits. With the rapid expansion of amateur lapidary activity after World War II, production in British Columbia's jade fields picked up, and they became the most important suppliers. About the same time, markets opened up in Germany and the Orient. Mining activity gradually depleted the secondary deposits, but increasing values led to further exploration. These efforts uncovered primary deposits adjacent to the Fraser River area in southern British Columbia, the Mount Ogden area in central British Columbia, and the Cassiar jade fields in the far north. Today, British Columbia is the main supplier for the China market. Jade West Group, founded in 1981, is the biggest player in green nephrite mining and trading in British Columbia. Nephrite mining in British Columbia is very challenging. Winters are long and harshly cold, and deposits are remote, so mining can only happen during the short summer season, about 60 days a year. Almost all of the secondary deposits are exhausted, so current mining is almost all from primary deposits. Transporting the heavy equipment to the mining sites is backbreaking work. Jade West uses diamond-coated circular and wire saws and modern high-pressure hydraulic splitters to remove the nephrite from the mountain and saw it into pieces of a manageable size. Nephrite's excellent toughness makes it extremely difficult to break out of the rock. While blasting had been used in the past, Jade West no longer uses explosives. Nephrite deposits range from 12 inches to 12 feet wide. The wider deposits are very challenging to quarry. Nephrite boulders on the surface sometimes reach weights of 200 tons and are rarely under 100 pounds, but Jade West tries to limit the weight of its boulders to five tons, which is a reasonable size for them to mine, handle, and transport on trucks to the nearest town, about 100 miles away. The average weight is two tons, a size that satisfies most of the carving factories in China.

The Jade Deposits in Canada. The Polar Pride boulder—called "the find of the millennium" by trade experts—was discovered in Canada. The 18-ton boulder was split in half for carving. Courtesy of Jade West Group

https://www.geologyin.com/2016/12/the-giant-nephrite-jade-road-in-canada.html#sOCf7x3YsMH2jk7q.99

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 dispose of their collections. Knowledgeable club members act as auctioneers. Auctions typically attract about 100 bidders and about 1300 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 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 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.

"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
Vice President.	Ray Anderson (*rockdoc.anderson@gmail.com*)	530-2419
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Director '25	Matt Burns (mlburnsmars@gmail.com)	329-4046
Sunshine	Dolores Slade (doloresdslade@aol.com)	351-5559
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:
JULY 18
Wanatee Park
Pot-Luck Picnic
Meadowlark Pavilion

Ray Anderson, Editor
2155 Prairie du Chien Rd. NE
Iowa City, Iowa 52240-9620