Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS **DECEMBER 2017** **VOL. 43, ISSUE 10**

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Next CVRMS Meeting Tues. DEC. 12 HOLIDAY PARTY & POTLUCK

The **CVRMS 2017 Holiday Party** will be a week earlier than our usual monthly meeting, on **December 12** at the Hiawatha Community Center in the Hiawatha City Hall, 101 Emmons St., Hiawatha. We will **meet around 6:00 pm** and **eat at 6:30 pm.** The club will provide ham and turkey, potatoes, dressing, and gravy (prepared by Dell) as well as soft drinks. Participants are invited to bring other dishes to contribute to our annual feast. Please bring your own ***table service*** and a ***big appetite.*** Games will be organized with prizes for winners. Ray will put together a show of slides contributed by participants in the Field Trip to the Field Museum.

Hiawatha City Hall and Community Center

See Page 10 for Additional Information

Eclogite: The "Christmas Rock"

Thirty miles is not far (just the distance from Cedar Rapids to Iowa City. But going 30 miles down is a different thing entirely. It's a place of crushing pressure and meltingly high temperatures. One type of rock that has been that deep or deeper is **ecolgite,** referred to by some as "***Christmas rock***." Eclogites are typically formed by subduction of basaltic oceanic crust that originally formed at mid-ocean ridges, where melting of the earth's mantle produces a layered crust, basalts on top and gabbro below. New oceanic crust is constantly being created, and to make room for it, older colder oceanic crust is pushed back down into the mantle at subduction zones. As this old crust sinks deeper and deeper, the gabbro and basalt are transformed multiple times, recrystallizing, releasing fluids that create new crust far above, and maybe even growing diamonds. Most eclogite doesn't reach the surface, but sinks deep into the mantle. The distinctive red and green coloring of eclogites is due to their primary mineral composition of **pyrope garnet** (*red*) and **omphacite pyroxene** (*green*). The formation of eclogite from its basaltic protolith is shown by this idealized mineral reaction:

plagioclase + olivine + diopside = omphacite + garnet.

One of the distinguishing factors of an eclogite is the lack of plagioclase, which becomes unstable and breaks down at very high pressures and temperatures (temperatures exceeding 500°C and pressures over 12 kbar). http://the-earth-story.com/post/160941050104/metamorphism-at-great-depths-eclogites

CVRMS Nov. 20 Meeting

Meeting Called to Order by Marv 7:16 pm. Guests included Colton Desmarais (son of Bill & Karen), Judy Hartman (from Mechanicsville) and her neighbor Chris Chistler.
Minutes of October meeting were approved.
Dale presented October and November Treasurer's report (CVRMS finances are sound). Reports approved.

Bill Desmarais presented the program ***"Southeast Alaska Puts the Awe in Awesome!"*** followed by a break and treats.
Election of CVRMS Officers for 2018. Dale presented the slate of officers suggested by the Nominations Committee and Marv made 3 calls for additional nominations; none were received, so a motion to approve the slate of officers suggested by the Nom. Comm.was made, seconded, and approved by unanimous vote.

CVRMS OFFICERS FOR 2018

President	Marv Houg
Vice President	Ray Anderson
Treasurer	Dale Stout
Secretary	Dell James
Editor	Ray Anderson
Liaison	Bob Roper
Director '20	Jay Vavra
Webmaster	Sharon Sonnleitner

CVRMS Holiday Party is scheduled for 6:30 pm December 12 at the Hiawatha Community Center. A motion was made and approved to ask Del if we could have the main course dishes catered by Hy Vee to save her having to prepare them.

CVRMS annual bus field trip. Marv reported that feedback on last month's trip was all positive. Terry moved to plan a similar trip for 2018 and the vote carried. Bill suggested that the Milwaukee Museum would be an interesting venue to visit.

Crinoid State Fossil Project. Ray reported progress and is preparing additional information to prepare the legislation, as requested by Sen. Joe Bolkcom.

2018 Agate Calendars will be ordered by Dale and will be available at the Holiday Party for $8.00 each.

Klein Quarry Field Trip on Sunday Nov 5. Marv reported about 20 people attended and crystals and fossils (including a trilobite) were found.

Devonian Fossil Gorge. Marv reported that a revision of Devonian Fossil Gorge is being planned, and he heard from Tiffany Adrain that the gorge is being considered for inclusion in the UNESCO Geoparks system.

Midwest Federation. Tom reminded us that our dues (including club member field trip insurance) is due and Marv agreed to discuss it at next board meeting.

Motion to Adjourn. was made at 9:23 pm and the meeting was adjourned.

Respectfully Submitted,
Ray Anderson, Acting Secretary

CVRMS Board Minutes Oct. 31

Call to order at 7:25pm by Marv Houg at his house.

Members present: Pres. Marv Houg, Dale Stout , Ray Anderson, Jay Vavra, Sharon Sonnleitner, Dell James, Bill Desmarais, Bob Roper, Rick Austin.

CVRMS Holiday Party: Suggestion made to have turkey and main ingredients catered to give Dell a break. Initial reaction from Dell was to continue on as usual but will think about the option since she does not have the usual crew available. Pot luck (appetizers, sides and desserts) will be provided by the club members for the remainder. Ray will put together a slide projection of various activities in the past year. Bill will bring projector and computer for use. Anyone with pictures please email to Ray. Door prizes are needed. Bring with you to the party if you have any to donate. Dell will call Julie to coordinate games. The hat will be passed to collect for our designated charities HACAP and Linn County Food Bank.

CVRMS Rock Show March 24 and 25, 2018: Bob Roper reported that contracts to vendors will go out next Monday. Ray will develop charts and posters about the crinoids. General discussion about availability of crinoid video on You Tube. Can we run a TV program during the show about crinoids? Programs are coming together. Brian Witzke will talk on Crinoids in general. Tiffany Adrain will talk about U of IA crinoids. Ray will check with Brian regarding Saturday night talk after catered dinner. Sharon will prepare flyers to promote the show by next month. Dell had sent show date info to *Rock and Gem, Rock and Minerals*, and other periodicals. Sharon has 2 specimens for the raffle, we need a Geode and an amethyst Cathedral. Total 5-6 items. Dale will get raffle permit from the state. Marv will check on catering. Dinner at 6:15pm on Saturday and talk to HyVee about the catering problems from last year. Discussion about closing time on Sunday and whether it should be moved up an hour. Consequently, the show will close at 4:00 pm instead of 5:00pm. Raffle drawing will be at 3:30pm. Dell will arrange lunch on set-up Friday. Discussion of major displays; Ray will talk to Tiffany about the displaying the new Eurypterid model.

2018 Bus Field Trip: Bill is working on next year's bus trip. One stop will be the Milwaukee Public Museum, and secondary stops were discussed. Sunday, Nov.4, 2018, is a designated date.

2018 Rock Auction: Rock and Mineral specimens from Don Koch's estate will be picked up by Marv and Ray, with specimens to be sold at our Rock Auction.

Misc: Ray reported that Sen. Joe Bolkcom is now preparing the bill to designate the crinoid as ***Iowa's State Fossil*** for consideration early in the 2018 legislative session. Marv reported that Tom from River Products in interested in preserving the ***Devonian Fossil Gorge***. Marv and Ray will go on Friday to pick up fossils and River Products will hold until further notice. Rick is looking for a new club projector. ***Memorial donations*** have not been made since May 2015. Sharon will check records and see who and how many need to be paid at $25 each. Historically we donate to Wickiup Hill Nature Center.

Adjournment: Move to adjourn made by Ray, second by Bill. Meeting adjourned 9:50pm

Respectively Submitted,
Dell James, Secretary

The Membership Has Voted

The November 20 CVRMS meeting was our ***Annual Meeting,*** which meant that members elected club officers for 2018. The membership agreed with suggestions from the nominating committee that the current slate of officers should be retained. They include:

2018 CVRMS Officers

President	Marv Houg
Vice President	Ray Anderson
Treasurer	Dale Stout
Secretary	Dell James
Editor	Ray Anderson
Liaison	Bob Roper
Director '20	Jay Vavra
Webmaster	Sharon Sonnleitner

Congratulations to next year's CVRMS officers.

It's not everyday that you find a space rock on Mars. But that's exactly what NASA's Curiosity rover discovered on Oct. 27. The rock looks completely different from its surroundings because it's made of completely different materials. This strange rock is made up of iron, nickel, phosphorous and a

few other trace elements, which led scientists to conclude that it is a meteorite that is non-native to the Red Planet.
http://www.businessinsider.com/nasas-curiosity-rover-found-weird-metal-mars-rock-2016-11?utm_content=buffercdf45&utm_

If you were born in December you may choose from 3 birthstones, zircon, tanzanite, turquoise

Zircon is a mineral belonging to the group of nesosilicates. Its chemical name is zirconium silicate and its corresponding chemical formula is $ZrSiO_4$. A common empirical formula showing some of the range of substitution in zircon is $(Zr_{1-y}, REE_y)(SiO_4)_{1-x}(OH)_{4x-y}$. Zircon forms in silicate melts with large proportions of high field strength incompatible elements. The crystal structure of zircon is tetragonal crystal system. The natural color of zircon varies between colorless, yellow-golden, red, brown, blue, and green. Colorless specimens that show gem quality are a popular substitute for diamond and are also known as "*Matura diamond*".

Tanzanite is the blue/violet variety of the mineral zoisite (a calcium aluminium hydroxyl Sorosilicate—$Ca_2Al_3(SiO_4)_3(OH)$) belonging to the epidote group. It was discovered in Northern Tanzania in 1967, near the city of Arusha and Mount Kilimanjaro. Tanzanite is used as a relatively cheap gemstone, where it can substitute for the far more expensive sapphire after undergoing artificial heat treatment to form a deep blue coloration. Naturally formed tanzanite is extremely rare and is endemic only to the Mererani Hills. Tanzanite is noted for its remarkably strong trichroism, appearing alternately sapphire blue, violet and burgundy depending on crystal orientation. Tanzanite can also appear differently when viewed under alternate lighting conditions. The blues appear more evident when subjected to fluorescent light and the violet hues can be seen readily when viewed under incandescent illumination. Tanzanite is usually a reddish brown in its rough state, requiring heat treatment to bring out the blue violet of the stone.

Turquoise is an opaque, blue-to-green mineral that is a hydrated phosphate of copper and aluminium, with the chemical formula $CuAl_6(PO_4)_4(OH)_8{\cdot}4H_2O$. It is rare and valuable in finer grades and has been prized as a gem and ornamental stone for thousands of years owing to its unique hue. The substance has been known by many names, but the word *turquoise* dates to the 17th century and is derived from the French *turques* for "Turks" because the mineral was first brought to Europe from Turkey, from mines in the historical Khorasan Province of Persia. Pliny the Elder referred to the mineral as *callais* and the Aztecs knew it as *chalchihuitl*.

• • *information from Wikipedia*

What in the World?

This beautiful piece was carved from the *world's deadliest mineral.* What in the World is the mineral and why is it so deadly??

November's Photo

October's **What in the World?** photo shows the **Hoba meteorite** in Namibia, the world's largest-known meteorite, The 9 foot wide, 3 foot thick, 66 ton iron meteorite was discovered when it was struck by a farmer's plow. The pit around the rock was constructed to give tourists and scientists access to the stone. It has no observable crater, which suggests it fell to Earth at a very slow speed.

Rock Calendar 2017
CVRMS Events of Interest

2017

Dec. 12 - CVRMS HOLIDAY PARTY
Hiawatha Community Center

See Page 10 for Additional Information

We Wish You a Happy Holiday!

2018

March 24-25 - CVRMS Gem, Mineral, and Fossil Show
"Crinoids; Iowa's State Fossil?"
Hawkeye Downs, Cedar Rapids

April 6-April 8—MAPS National Fossil Expo 39
"Permian AND Triassic Periods"
Sharpless Auctions Facility, Iowa City

Sept. 15-16—CVRMS Rock Auction
Amana RV Park and Event Center
Amana, Iowa

Ask a Geologist

by Ray Anderson aka "Rock Doc", CVRMS Vice President

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

***Rona asked*:** *"What should you do if you see a meteorite fall and are able to find it??*

Rock Doc replied: In the very unlikely circumstance that you see a meteorite fall and are able to actually find it, you should not touch it; not because it will be very hot (in fact it will likely be very cold from the long time it was in space), but you want to keep it a pristine as possible for possible scientific study. To keep your meteorite in the best possible shape, here are some general guidelines:

- Keep magnets away from them (in order not to destroy any natural magnetism in the rock)
- Do not touch the meteorites (in case your hands contain moisture, oils, and bacteria).
- Use aluminum foil to collect the meteorite and to store and handle it.
- When you show the meteorites to others, minimize exposure to moisture (such as from people talking over it).
- Keep plastics away from the meteorite. No storing in plastic bags, plastic containers, no touching with gloves.
- Store the meteorites wrapped in aluminum foil in a clean (no smell) glass jar, covered by a sheet of aluminum foil. Put that jar in a bigger jar with closed lid with some desiccant on the bottom (if no other desiccant is available, one-minute rice will do). Allow the meteorite to dry out in this way to remove all adsorbed water vapor.
- Once the meteorite is dry, after a day or so, put the whole contraption in the freezer in order to stop bacteria growth in the meteorite.

A good example is the Sutter's Mill meteorite, a carbonaceous chondrite which entered the Earth's atmosphere and broke up on April 22, 2012, near the California Gold Rush site. (You can read more about it at http://articles.latimes.com/2012/dec/21/science/la-sci-sn-sutters-mill-meteorite-oldhamite-20121221). Many samples of the meteorite were recovered by scientists that used the proper collecting protocols, and their efforts were rewarded. The meteorite was found to contain some of the oldest material in the solar system, including some grains survived from material that existed in the cloud of gas, dust and ice that formed the solar system. They discovered two 10-micron diamond grains (xenoliths) found in meteorite pieces recovered before rains damaged some of the material. Scientists were also surprised to find oldhamite, a calcium magnesium sulfide mineral (Ca, Mg)S, in the primitive carbon-rich stone that they believed formed far out in the solar system. Oldhamite is so reactive that the moisture from a human breath can destroy it. Other materials identified from Sutter's Mill samples include polyethers and polyether esters (the first ever observed in meteorites). These molecules likely formed several billion years ago in conditions similar to those on early Earth; warm and rich in water. The Sutter's Mill meteorite was a well-mixed rock, produced by collisions in space between really primitive materials and really evolved materials. None of this good science would have been possible without the proper collection of the samples.

Peter Jenniskens, a meteor astronomer at NASA Ames Research Center and the SETI Institute in Mountain View, CA, collects a sample of Sutter's Mill meteorite using aluminum foil to avoid contaminating it.

Sutter's Mill meteorite specimen

Tiger Iron is a rock that is made up of tiger's eye quartz, black hematite, and red jasper. These minerals create contrasting bands of color for a truly unique look popularly used for many sorts of ornamentation and decoration.

Also called ***muggle-stone***, Tiger Iron was originally deposited as a sediment, a Precambrian banded iron formation, probably deposited in association with algal stromatolites. This deposit was then subjected to low-grade metamorphism that preserved layers of hematite and jasper while producing layers of *crocidolite* (a variety of *riebickite* with fibrous, asbestiform crystal structure — sometimes also referred to as "*blue asbestos*" and considered to be the most hazardous form of asbestos). During the late stages of the metamorphism, quartz fills pores in the hematite and jasper and replaces the crocidolite, preserving its fibrous crystal habit (quartz pseudomorphs after crocidolite) and eliminating any dangers to human health. In fact, if you are a believer in the *metaphysical power of rocks and crystals*, the trio of minerals that make up this stone can give you a centering and calming energy, which makes Tiger-Iron a powerful grounding stone. It will give you courage, strength, and stamina to fulfill your responsibilities and achieve your dreams. This stone's energies will also help you have more life and staying power with everything that you do. Tiger-Iron will help you have more confidence in your abilities. It will help you recognize your inner resources and help you to accomplish goals. It is a great stone for creative people to ground their ideas and bring them to the physical fruition. Tiger Iron is a good stone for assisting healers and other people who give their energy to others to keep themselves charged up. But you don't have to believe in mystical powers to enjoy the beauty of one of nature's spectacular gem stones, the Tiger-Iron.

The first-ever 2017 **Flat Earth International Conference** (FEIC) was held in Raleigh on Nov. 9 and 10, featuring some of the big names in round-Earth denial. Among the speakers were Darryle Marble, who once took a level on a plane to "*prove*" the Earth doesn't curve; Mark Sargent, the creator of the *Flat Earth Clues YouTube Series*, who believes all life is enclosed in a "*Truman Show*"-like dome structure; and Jeran Campanella, a *YouTube* and online radio personality, who makes flat-Earth, *9/11 Truther* and other conspiracy theory videos. The conference was hosted by **Kryptoz Media**, which produces DVDs and other media arguing that "***scientism***" is an agenda designed to keep people from God, and the Creation Cosmology Institute. The conference featured talks such as "*NASA and Other Space Lies*," "*Flat Earth with the Scientific Method*," "*Waking Up to Mainstream Science Lies*" and "*Testing the Globe*." The conference organizer, **Kryptoz Media's** Robbie Davidson, is a Christian creationist, and that philosophy emerged in sessions such as "*Flat Earth & The Bible*" and "*Exposing Scientism*," the latter of which decried evolution and

the Big Bang theory of the universe's origin. Flat-Earthers believe that Earth is not a globe, but a flat plane. Beliefs on how the "*true*" globe is laid out vary, but many *YouTube* personalities who push the conspiracy theory say that the planet is a disc surrounded by an ice wall. Flat-Earthers argue that NASA and other scientific agencies digitally fake pictures of the globe from space and that there is a vast conspiracy to keep the truth of the flat Earth from the public. Recently, flat-Earth believer and rapper B.o.B. tried to crowdfund $1 million via GoFundMe to launch a satellite to see if he could detect for himself the curvature of the Earth. GoFundMe temporarily froze the donation account, but it is now back online, having raised $6,842 from 224 people. No one knows how many people really subscribe to flat-Earth beliefs. The Flat Earth Society, the oldest organization devoted to the belief, claims 555 members. Marble boasts 22,954 subscribers to his YouTube channel. About 500 people attended the conference in Raleigh. The next annual Flat Earth International Conference will be held in Denver, from Nov. 15 -16, in 2018. Davidson said he expects up to 1,500 attendees. https://www.livescience.com/60972-flat-earthers-first-conference.html

Found: A Rare Carved Stone That Could Rewrite Art History

Pylos Combat Agate (above) and a representation of the stone's carving (below) show meticulous levels of detail.

In spring 2016, a team of archeologists from the University of Cincinnati was digging at a Mycenaean site in the Pylos region of Greece when they made a surprising discovery: the intact tomb of a Bronze Age warrior dating to about 1500 B.C. The Greek Ministry of Culture and Sports declared the find the "most important to have been discovered in 65 years." Now, almost two years later, the tomb has revealed its most valuable secret, an intricately carved sealstone that researchers are calling "*one of the finest works of prehistoric Greek art ever discovered*." It didn't look so at first, but once a thick crust of limestone was cleared off it revealed a detailed scene of a victorious warrior, one defeated opponent beneath his feet and another falling at the tip of his sword. And all this was carved in meticulous detail on a piece of agate stone just over 1.4 inches long. The sealstone presents two mysteries. One is how and why it was engraved in such detail. The other is whether its battle scene, strongly evocative of those in Homer's "*Iliad*" and "*Odyssey*," depicts an event that contributed to the oral tradition behind the works of Homer. The dig's coleaders, Shari Stocker and Jack Davis of the University of Cincinnati, were surprised by the detailed engravings, including intricate weaponry ornamentation and jewelry decoration. Such work has never been seen before in art from the Aegean Bronze Age. "*What is fascinating is that the representation of the human body is at a level of detail and musculature that one doesn't find again until the classical period of Greek art 1,000 years later*," Davis explained in a release. "*It's a spectacular find.*" Indeed many of the details in the "**Pylos Combat Agate**," as it has been dubbed for the type of rock it is carved on, become clear only when viewed with photomicroscopy, which has left the researchers wondering about the technique behind it. "*Some of the details on this are only a half-millimeter big*," said Davis. "*They're incomprehensibly small.* "**The "Griffin Warrior**," who was buried in the tomb and gets his name from an adorned ivory plaque buried with him, probably died around the time when the militaristic and austere Mycenaean culture, based in mainland Greece, conquered the culturally sophisticated Minoans, based on the large island of Crete, just south of Pylos. But much of what was found in the tomb appears to be of Minoan fabrication, which suggests greater and more complex cultural interchange between the civilizations than was previously known. The sealstone is mounted so that it can be worn on the wrist, and indeed the hero is wearing just such an item, as if it were a wristwatch. The scene evidently represents some event that would have been familiar to the Minoans who made the sealstone and to the Griffin Warrior's community.

modified from http://ofthebox.org/found-rare-carved-stone-rewrite-art-history

What's New In Iowa Geology ??

PREHISTORIC MIDWESTERN MONSTER

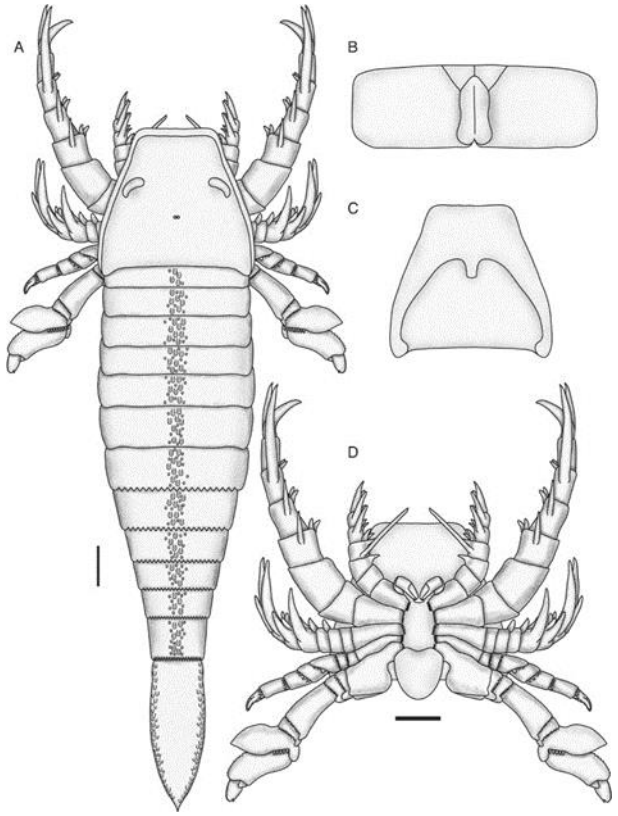
http://channel.nationalgeographic.com/the-strange-truth/videos/prehistoric-midwestern-monster/

No, this is not a photo of a Prehistoric Midwestern Monster, it is Yale University Paleobiologist Dr. James Lamsdell. The National Geographic has produced a short video called ***Prehistoric Midwestern Monster*** in which Dr. Lamsdell discusses eurypterids (sea scorpions) fossils discovered by the Iowa Geological Survey during their bedrock mapping activities in the Decorah area. (view video by clicking on image ahove). From his studies of these animals he supervised the construction of a true-size model of this animal that was debuted on the first show of the National Geographic TV series "***Strange Truth***," a program about the animals preserved in the 430 million year old crater of the Decorah Impact Structure called "***The Day the Sky Fell***," first aired in 2016. **(click on photo to view show —>>>).**

The model of the eurypterid is called ***Scorpy*** by people who visit it in the University of Iowa Mobile Museum. The animal was technically named ***Pentecopterus decorahensis*** by the scientists who studied it (see **Page 9** for additional information).

"Scorpy" the Eurypterid Gets a Real Name

In a recently published manuscript geologists have formally described and named the eurypterids that were excavated with the incredible trove of Ordovician fossils in the Winneshiek Shale formation near Decorah. Published in the online journal *BCM Evolutionary Biology* in September of 2015, *"The oldest described eurypterid: a giant Middle Ordovician (Darriwilian) megalograptid from the Winneshiek Lagerstätte of Iowa"* by James Lamsdell, Derek Briggs, Paul Liu, Brian Witzke, and Bob McKay. It describes *Pentecopterus decorahensis*, the oldest described eurypterid, predating the next oldest (*Brachyopterus stubblefieldi)* by some 9 million years. A life-size model of the animal was produced for a National Geographic TV production on the Decorah Impact Structure (**see photo on Page 8**). The model has been informally called "*Scorpy."* Its new name, *"Pentecopterus,"* was derived from **Greek warships (*penteconters*) -** which the taxon superficially resembles in outline - and the **Greek word for wings (*pterus*)** because the sea scorpion was likely a top predator that sped through the water, and *"decorahensis"* for its Decorah locality. Eurypterids are a monophyletic group of Paleozoic aquatic arthropods which represent the first major radiation of chelicerates: some 250 species are known from marine to freshwater environments. With a known range from the Darriwilian (Middle Ordovician) to the Wuchiapingian (Permian), they are distinctive and relatively common fossils in Silurian and Devonian rocks where conditions favored the preservation of their unmineralized cuticle. The new eurypterid species was described from more than 150 specimens, including some juveniles, preserved as carbonaceous cuticular remains. The Winneshiek Shale in which they were found is characterized by abundant well-preserved fossils including conodonts, arthropods, possible jawless fish, algae, and plant materials. Studies indicate that the shale was deposited in a meteorite impact crater, located in a marginal to nearshore marine location, characterized by low-oxygen and possibly brackish water, within tropical southern Laurentia. Rhythmic sandy laminations may indicate a local tidal influence. The Winneshiek fauna is dramatically different from a normal marine shelly fossil fauna, indicating that the restricted environment was inhospitable to typical marine taxa. All materials described in the manuscript are reposited in the Paleontology Repository, Department of Earth and Environmental Sciences, University of Iowa.



Pentecopterus decorahensis, reconstruction of adult. **a** Dorsal view. **b** Genital operculum. **c** Ventral view of carapace and prosomal ventral plate. **d** Ventral view of prosoma. The appendages are shown rotated in lateral view; in life, appendages IV–VI

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4556007/pdf/12862_2015_Article_443.pdf

CVRMS ANNUAL HOLIDAY PARTY

December 12

6:00 p.m. to **9:00** p.m. (eat at **6:30**)

Ugly Christmas Sweater Contest with Prizes

Pot Luck

*** bring your own famous holiday dish ***

*** bring your own place settings ***

CVRMS will provide drinks and main dish (turkey/ham)
mashed potatoes, stuffing, and gravy, games and door prizes

A COLLECTION WILL BE TAKEN
for HACAP & Linn County Food Bank
(if you can't make it to the party and wish to contribute mail check to Dale Stout)

Hiawatha Community Center
101 Emmons St., Hiawatha

graphics by Dell

Anthropogenic Climate Change

from Geological Society of America Forum 11/07/2017

A lay reader following the comments on this forum, might be given the misleading impression that anthropogenic (related to human activities) climate change is controversial-when in fact it is not. How did this happen? A few people on this forum, presumably geologists, appear to be challenging the scientific consensus position of anthropogenic or human-caused climate change. Also, it's important to clarify that the term "consensus" is not interchangeable with the term "settled" because science by definition is never settled.

The scientific consensus for anthropogenic climate change is shared by the vast majority of the world's climate scientists. Many independent lines of evidence show support for the consensus, including numerous polls of scientists and surveys of the scientific literature conducted to evaluate scientific opinion on anthropogenic climate change. The results have been consistently very high with 95 to 99 percent of scientists supporting the consensus (see Benestad and others, *Theoretical Applied Climatology*, 2016, 126:699-703); and significantly, the percentage is increasing steadily in light of new research. Furthermore, the greater the scientist's expertise, specialization and research in climate science, the more likely the scientist supports the consensus. However, by far the most compelling evidence of a scientific consensus for anthropogenic climate change is the fact that more than 200 of the most well-respected scientific organizations of national and international standing have published formal statements warning about the urgency of mitigating human-caused climate change.

Climate denialists use well-known rhetorical tactics to give the appearance of controversy and debate, where there is none among climate scientists. These tactics include (1) conspiracy theories contending that scientists conspire to prevent opposing views from being published; (2) cherry picking anomalous papers or fringe-science papers while ignoring the vast scientific literature that repudiates their position; (4) false experts, including those that have credentials but not in the field of climate science; and other logical fallacies such as false analogy, strawman and red herring arguments; and (5) accusing climate scientists of having a political agenda when in fact the denialist is motivated by a political/economic agenda.

One of the most persistent climate myths raised time and again by denialists, especially by those who happen to be geologists, is that the climate has changed many times through geologic time and that the current warming is a natural change. We all know that there have been many long periods when the Earth was warmer than at present. As our colleague Dr. Jerry Dickens pointed out on this forum, the Paleocene-Eocene Thermal Maximum (PETM) was a period approximately 55.5 million years ago when the temperatures were 8 degrees Celsius warmer than the average global temperature today. This warm period lasted about 200,000 years, but the period of massive carbon injection into the atmosphere may have lasted no longer than 20,000 years.

The maximum sustained carbon release rate during the PETM was approximately 1 Gt/yr. By contrast, the present carbon release rates from anthropogenic sources is about 10 Gt/yr (Zeebe and others, Nature Geoscience, 2016). Significantly, the PETM was likely the most extreme case of rapid global warming and massive carbon injection during the last 65 million years. With our current unprecedented rate of about 10 Gt/yr, the response of the Earth is difficult to estimate but it is possible that extreme weather events, atmospheric and ocean warming, ocean acidification and sea level rise will increase at rates never experienced on Earth.

Under the scientific method, all hypotheses, including those in the field of climate change, must be falsifiable and are never proved or " settled." The possibility must remain that some test or experiment, no matter how unlikely, could invalidate the hypothesis; otherwise, the hypothesis could not be properly tested and it would not qualify as a science. Climate science will continue to be tested, reported and modified in peer-reviewed science journals as it has thousands of times in the past; and, it will continue to be revised in light of new scientific discoveries. However, challenging consensus science by denialist tactics is not only inappropriate but is an abuse of science.

Terry Maley, Ph.D.

During my 50-plus years as a geologist (not a climate scientist), I've acquired a deep respect for peer-reviewed consensus science as a crucial part of the scientific method. It's certainly not perfect but no other method of knowing even comes close.

2017 Officers, Directors, and Committee Chairs

President	Marv Houg (m_houg@yahoo.com)	364-2868
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Club meetings are held the 3rd Tuesday of each month from September through November and from January through May at 7:00 p.m., at the Hiawatha Community Center in the Hiawatha City Hall, 101 Emmons St., Hiawatha IA. The December meeting is a Christmas dinner held the 2nd Tuesday. 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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