

Cedar Valley Gems

Cedar Valley Rocks & Minerals Society

Cedar Rapids, Iowa

cedarvalleyrockclub.org

CEDAR VALLEY GEMS

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

**Next CVRMS Meeting
Tues. June 19**

**First Summer Potluck
Ellis Park Overlook Shelter**



“we eat at 6:30 pm”

evening’s entertainment: —**LAPIDARY**



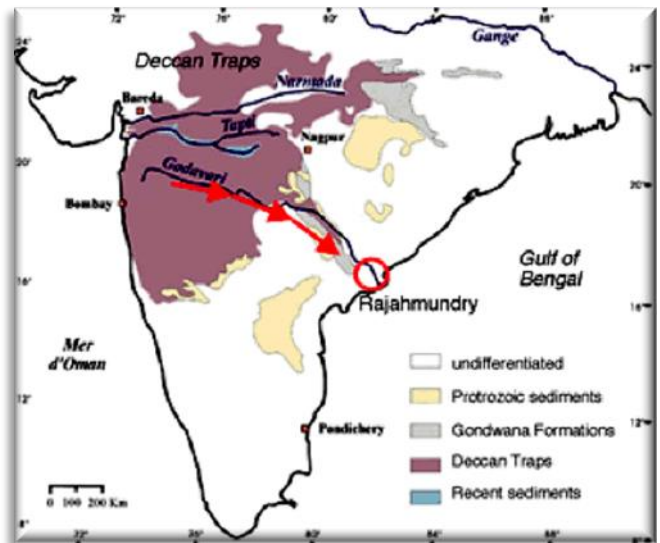
**July 17
Potluck**
Squaw Creek Park
Meadowlark Shelter

evening’s entertainment: —**GEODE CRACKING**



**August 21
Potluck**
Morgan Creek Park
Shelter

evening’s entertainment: —**BINGO**



The Deccan Traps in India, with 1200 cubic miles of basalts (up to 4,000 ft thick), is one of the most massive outpouring of magma on Earth. It produced the world’s longest lava streams, which flowed westward over 900 mi across India and into the Gulf of Bengal at Rajahmundry. Four to five of these longest lava flows occurred 67.4 Ma, just prior to the Cretaceous-Tertiary Boundary mass extinction (65.5 Ma). Another four occurred during the last Deccan eruption phase ending about 64.8 Ma in the early Tertiary.



Deccan trap rocks at the Gauriputnam Quarry, Rajahmundry India

CVRMS May 15 Meeting

Hiawatha Community Center

Called by President Marv Houg at 7:15
at Hiawatha Community Center

THE MEETING WAS CALLED TO ORDER by President Marv Houg at 7:15.

GUESTS: There were no guests.

MINUTES: The minutes of the April meeting were approved as published in the newsletter with the correction being made to the site of the 2018 MWF convention to Springfield, Illinois, rather than Decatur. Motion made by J.J. and seconded by Bill Desmarais.

TREASURER'S REPORT: The Treasurers report was approved as read, motion by Tom Whitlatch, second by Terri Schott.

PROGRAM: Ray Anderson presented a new program on the "Geology of Devonian Fossil Gorge," prepared as a part of training for new Corps of Engineers Coralville Dam employees.

NEW BUSINESS

2018 SCHOLARSHIPS: The Board recommended 2018 scholarships as \$4000 to the University of Iowa, \$3000 to Cornell and a \$1500 donation to VAST. Motion seconded by Harold Hensel. Motion approved.

DONATIONS FOR SHOW EXHIBITORS: The Board recommended donations of \$150 each to Beloit College, Augustana College and The University of Iowa for their special crinoid displays at the 2018 show. Motion was seconded by JJ. Motion was approved.

2019 SHOW THEME: The Board recommended "*Geodes - Iowa State Rock*" as the theme for our 2019 show. Motion was seconded by Mary Hensel. In the discussion that ensued, Julie made a case for a more Midwest theme since this was to be a Midwest Federation show, but the motion to name Geodes the theme carried. *Sharon was put in charge of the weather for the 2019 show.*

"BILLS BIG BUS BOOGIE" Bill Desmarais gave some more details on the November field trip to the Milwaukee museum. We would leave about 6:30 am. Club would pay for bus. Museum entrance fee "group rates" will significantly reduce the admission cost to participants (down from \$25 to \$13 for a regular adult) which includes admission to the planetarium (3D), world of frogs, and the butterfly room. There is a coffee shop and a cafeteria. The bus trip will be made available to non members after Sept. 1 at the nominal fee of \$25.

MOTION TO ADJOURN was made by Terri Schott and seconded by AJ. Meeting adjourned at 9:20

Respectfully Submitted,
Dale Stout, acting secretary

CVRMS Board Minutes May 29

Called at 7:05 at the home of Marv Houg

Present: President Marv Houg, Dale Stout, Ray Anderson, Bill Desmarais, Jay Vavra, Sharon Sonnleitner, Rick Austin

VAST CENTER: Bill announced the VAST Center is changing its geology identification kits and has donated the materials from the kits to the club. The donation is 300 bags, each containing 10 specimens, of each of the following: hornblende, hematite, pyrite, fluorite, feldspar, biotite, quartz, and gypsum.

AUCTION: This fall's auction is currently full, with between 1261 and 1376 lots. After discussion of possible food trucks, it was decided Sharon will do the food. Current reserved dates for 2019 are September 20-21. We are looking at the dates for the Denver Show and will consider if we want to change those dates so we don't conflict with Denver.

TAKO (Take a Kid Outside): On July 14 River Products will host TAKO at Klein Quarry from 9:00 to noon. We have been asked to help kids find fossils and minerals in material that has been hauled up near the office. Marv suggested putting together a booklet for the kids on the quarry, our club, and the material that can be found in the quarry. Dale made a motion that Ray draft a booklet on the quarry and the club pay to print it, with a cap of \$300. Seconded by Ray and approved unanimously. The motion will go to the general meeting for approval.

SHOW: Ray will reserve the Ramada Inn for the AFMS/MWF convention that will be held in conjunction with our 2019 Show. It was decided to have all events at the hotel.

BUS TRIP: Bill announced 34 of 52 spots are reserved for the November 4 bus trip to the Milwaukee Public Museum. We can get group rates if we commit at least 2 weeks in advance. It was suggested we ask participants to pay by October 1 so we can take advantage of the lower group rates. Anyone who does not pay in advance can pay the regular rate at the door.

PICNICS: Summer potluck picnics are set for Ellis Overlook (lapidary) in June, Squaw Creek Meadowlark (geode cracking) in July and Morgan Creek (bingo) in August. Eat at 6:30.

FIELD TRIP: Marv will look into setting up a field trip to Jesup for geodes before the July picnic.

PROJECTOR: Sharon made a motion that we purchase an Epson Powerlite 2250U projector at a cost of between \$1400 and \$1500. Seconded by Ray and approved unanimously. A budget of \$2000 was previously approved by the membership. Jay will make the purchase.

Adjourned at 9:30.

Respectfully submitted,
Sharon Sonnleitner, Acting Secretary

New Theory Suggests Gold Deposits Were Formed as a Result of Earthquakes



A new theory based on a simple but viable geologic model claims that over 80 percent of all commercial gold deposits were formed in a flash. Gold seams are formed when mineral-rich waters flow through networks of cracks in rocks some 3 – 19 miles below the surface. But the exact mechanisms by which the gold is deposited is not really that well understood. According to the new theory, local earthquakes brutally pull rocks apart, so fast that any fluids they contain are instantly vaporized, leaving behind the minerals they were carrying. Richard Henley of the Australian National University in Canberra and Dion Weatherley of the University of Queensland in Brisbane have studied earthquake dynamics, and found that quake-triggered pressure changes are much larger than was previously believed. Earthquake-triggered pressure is traditionally considered to be part of the process, but its impact has been considered to be quite small. According to Henley however, earthquakes can open cracks in the deep rocks at the speed of sound. As anybody who took a basic course in thermodynamics will tell you, the temperature at which water (or any fluid) boils is dependent on pressure. So when high pressures (remember, we're a few miles beneath the Earth's surface) drop almost instantly under the influence of earthquakes, and all the fluids are vaporized. As it evaporates, the minerals are deposited where they lay. "Large quantities of gold may be deposited in only a few hundred thousand years," says Weatherley – a brief interval by geological standards. "Each event drops a little more gold," adds Henley. "You can see it microscopically, tiny layer after tiny layer. It just builds up." An interesting possible explanation for the deposition of gold in veins.

<http://www.geologyin.com/2014/07/new-theory-suggests-gold-deposits-were.html>

Spotlight Gemstone: Alexandrite

June's Birth Stone



natural light incandescent light

June has three official birthstones, moonstone, pearl, and alexandrite. Of these, I think that alexandrite is the most interesting, so that is the birthstone that will be discussed this month. A relatively modern gem, alexandrite was discovered in Russia's Ural Mountain emerald mines. Legends claim that it was discovered in 1834 on the same day that future Russian Czar Alexander II came of age, hence the name honoring him. Because this unique gemstone changes colors from green to red (see example above), the national colors of Russia, alexandrite became Imperial Russia's official gemstone. Sometimes described as "emerald by day, ruby by night," alexandrite is a rare variety of the mineral *chrysoberyl* (an aluminate of beryllium with the formula BeAl_2O_4), a strongly pleochroic (trichroic) gem that will exhibit emerald green, red, and orange-yellow colors depending on viewing direction in partially polarized light. After Russia's mine deposits were exhausted, the popularity of alexandrite waned until new supplies were discovered in Brazil in 1987. Brazil, Sri Lanka and East Africa are now the main sources for alexandrite, though these are not as vividly colored as the original Russian stones.

Because it's so scarcely available, fine quality alexandrite is practically unaffordable to the general public. Even lower quality stones are expensive and limited in supply. Since the 1960s, labs have grown synthetic alexandrite (not to be confused with simulated alexandrite, which is actually corundum or colored crystals infused with chromium or vanadium for color). Creating synthetic alexandrite is an expensive process, so even lab-grown stones can be costly. Color change is the most important factor when determining alexandrite's quality and value. The brighter the colors and the more dramatic the change from bluish green in daylight to purplish red under incandescent light, the more valuable the gem. Like most gems, alexandrite is weighed in carats. Higher clarity may weaken the stone's color change, so color is much more important than clarity in this case. Alexandrite is more expensive than most gemstones, including sapphires, rubies, emeralds and diamonds. Top-quality Russian alexandrite has sold for as much as \$10,000 per carat. Most of the original Russian stones belong to museums or private collectors. The few gemstones that are produced today only fit the budgets of the most discerning gem experts. Alexandrite is a solid investment because of its rarity, durability and historical significance.

<https://www.americangemsociety.org/en/alexandrite-overview>

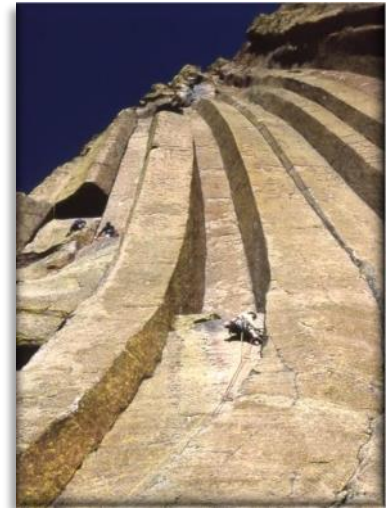
What in the World?

May's Photo



What in the World is this geologic event and how was this photo taken??

Last month's "What in the World?" photo was a view looking up the side of Devils Tower, the neck of an ancient volcano in Wyoming. Learn more about this feature and the exploits of one of our club members who climbed it on page 6 of this



Thanks from VAST: Club President Marv Houg received a nice thank you note from the Van Allen Science Teaching Center for our donation of \$1500 this year to assist their programs.

Rock Calendar 2018 CVRMS EVENTS OF INTEREST

June 8-9 - Missouri Mines Rock Swap
Missouri Mines State Historic Site
south side of Hwy. 32, 1.5 mi. west of US Hwy 67
south of Park Hills, MO

June 19 - CVRMS Monthly Meeting
Picnic at Ellis Park Overlook
"rock cutting and polishing"

July 14 - TAKO "Rockin' Rocks and Fossils"
CVRMS volunteers needed
see p. 9 for details

July 17 - CVRMS Monthly Meeting
Picnic at Squaw Creek Meadowlark Pavilion
"geode cracking"

August 21 - CVRMS Monthly Meeting
Picnic at Morgan Creek
"bingo"

Sept. 18 - CVRMS Monthly Meeting
Feature Program
Dr. Steve Spangler, "The Exoplanets"
Hiawatha Community Center 7:15 pm

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

Sept. 28-30 — Geode Fest
Chaney Creek Boat Access
1404 IL-96
Hamilton Illinois
[http://www.keokukiotourism.org/
event_calendar/geode_fest/index.php](http://www.keokukiotourism.org/event_calendar/geode_fest/index.php)

Oct. 16 - CVRMS Monthly Meeting
Feature Program
"To Be Announced"
Hiawatha Community Center 7:15 pm

Nov. 4—CVRMS Fall Field Trip
Milwaukee Public Museum
Milwaukee, Wisconsin
see p. 11 for details



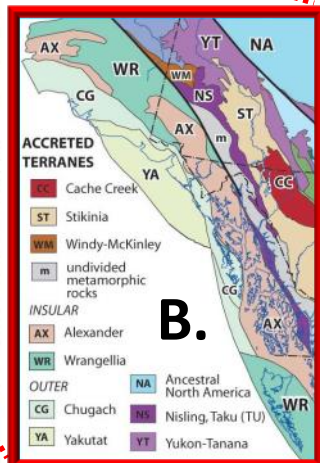
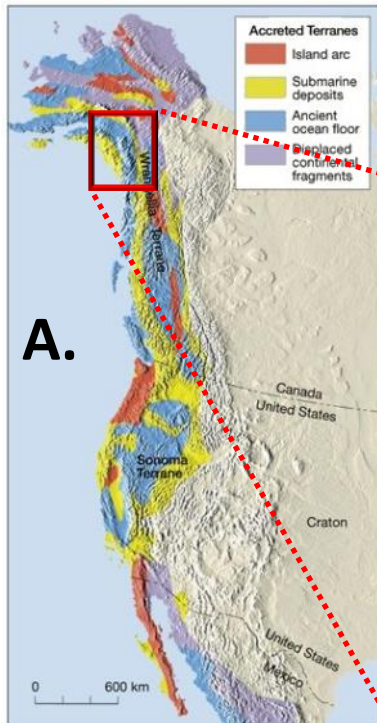
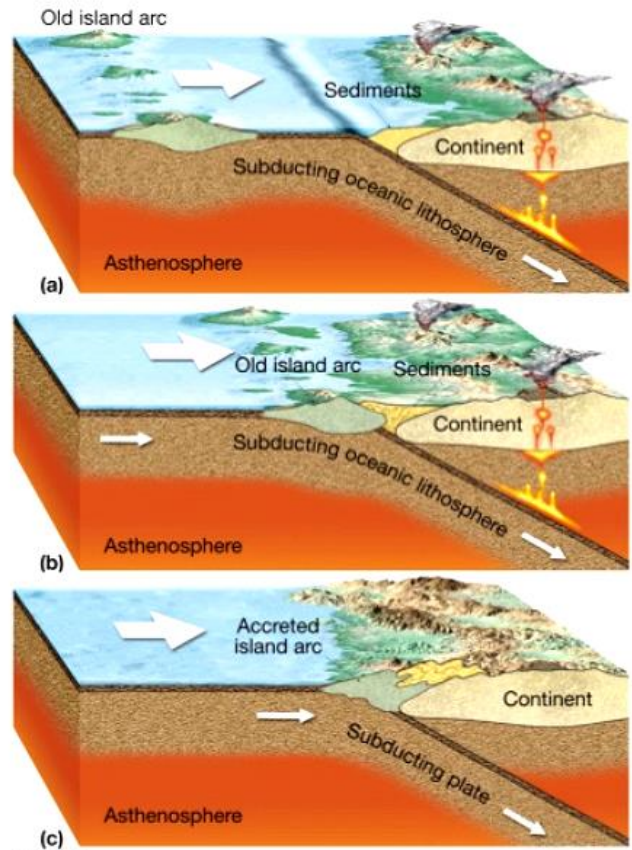
Ask a Geologist

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.

Rona asked: "Do islands ever get subducted with ocean plates at plate tectonics subduction zones??"

Rock Doc replied: "Not that we know of. As an oceanic plate is subducting under a continental plate, islands on the ocean plate will be carried to the subduction zone that lies along the edge of the continental plate. But rather than being subducted under the continent, those islands will get scraped off and "plastered" (or accreted) onto the continent's edge. This extends the continental margin, and creates quite a complicated geology. The result is a crazy-quilt of small "terrane" (the word terrane refers to sections of crust that were not formed with the surrounding crust). These "accreted terranes" frequently display varying compositions, origins, and ages. This produces a geology that was absolutely and frustratingly inexplicable to geologists before plate tectonics explained how these little random bits of real estate, created thousands of miles away, ended up all jumbled together. One common source is volcanic island arcs that formed on the oceanic plate, perhaps from part of that oceanic plate subducting under another oceanic plate. This was first studied in the U.S. Pacific Northwest, part of a huge collection of accreted terranes running from Mexico to Alaska. Note the terranes identified as "Island arc" in Map A below. - Those indeed would have been islands. But that map makes things look far too simple, because at its large scale it only shows the really big accretions. If you zoom in to see finer detail you wonder why, before plate tectonics, Canadian and American geologists on the west coast didn't just all give up in tears, toss their rock hammers in the trash, and go open up car dealerships or something. Map B shows part of the southern Alaska coast and Canada to

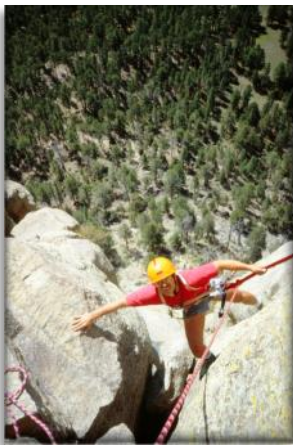
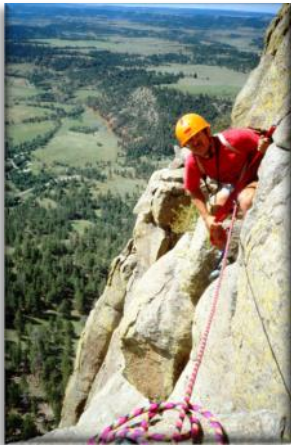


the East. It's not any better around Washington and Oregon. Accreted terranes are found from the coast all the way inland to Idaho. Much of the Appalachian Mountains is composed of similar terranes accreted to the east edge of the continent hundreds of millions of years ago. In fact much of North America (including Iowa) is composed of terrains accreted to the core of the continent billions of years ago.



Devils Tower as Seen by Bill Demarais

Devils Tower (also known as **Bear Lodge Butte**) is a butte composed of igneous rock in the Bear Lodge Mountains (part of the Black Hills) near Hulett and Sundance in Crook County, northeastern Wyoming. It rises dramatically 1,267' above the nearby Belle Fourche River, standing 867' from summit to base (the summit is 5,112' above sea level). The formation was formed about 40.5 million years ago when a magma chamber hundreds of feet below the surface cooled, contracting as it solidified, and forming a series of near vertical hexagonal columns of [phonolite porphyry](#), typically about 2' in diameter. Until erosion began its relentless work, Devils Tower was not visible above the overlying sedimentary rocks. But the forces of erosion (particularly that of water) began to wear away about 2,000' of sandstones and shales. The much harder igneous rock survived the onslaught of erosional forces, and the gray columns of Devils



two images of Bill Desmarais climbing Devils Tower

Tower began to appear above the surrounding landscape. As rain and snow continue to erode the sedimentary rocks more of Devils Tower will be exposed. But at the same time, the Tower itself is slowly being eroded. Rocks are continually breaking off and falling from the steep walls. Rarely do entire columns fall, but on remote occasions, they do. Piles of rubble (broken columns, boulders, small rocks, and stones) lie at the base of the Tower, indicating that it was, at some time in the past, larger than it is today. Eventually, at some time far in the future, even Devils Tower itself will be eroded away. Northern Plains Indian tribes worshipped at Devils Tower long before white men wandered into the West. They had numerous stories of how the feature formed, all involving a giant bear clawing at the rock while chasing humans. In 1906, President Theodore Roosevelt established Devils Tower as our nation's first national monument. In 1992 and again in 1993 CVRMS club member Bill Desmarais and his climbing partner Dave Corell (a former student) made the 867' climb to the summit of the tower. The climbs were "technical climbs" (involving ropes and related equipment) and required 2 to 3 hours to complete. The climbs were clearly very important events in Bill's life, and he is always anxious to talk about it. We thank Bill for sharing these picture and his story.



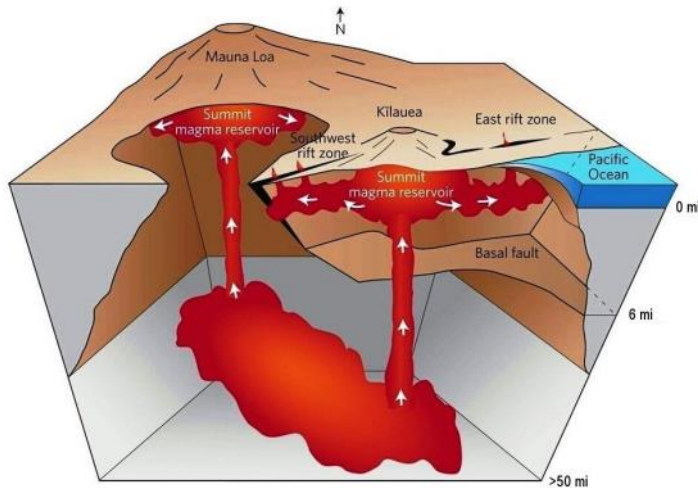
Bill at the top of Devils Tower



view from the top of Devils Tower looking at the surrounding landscape



What's Beneath Kilauea Hawaii's Most Active Volcano?



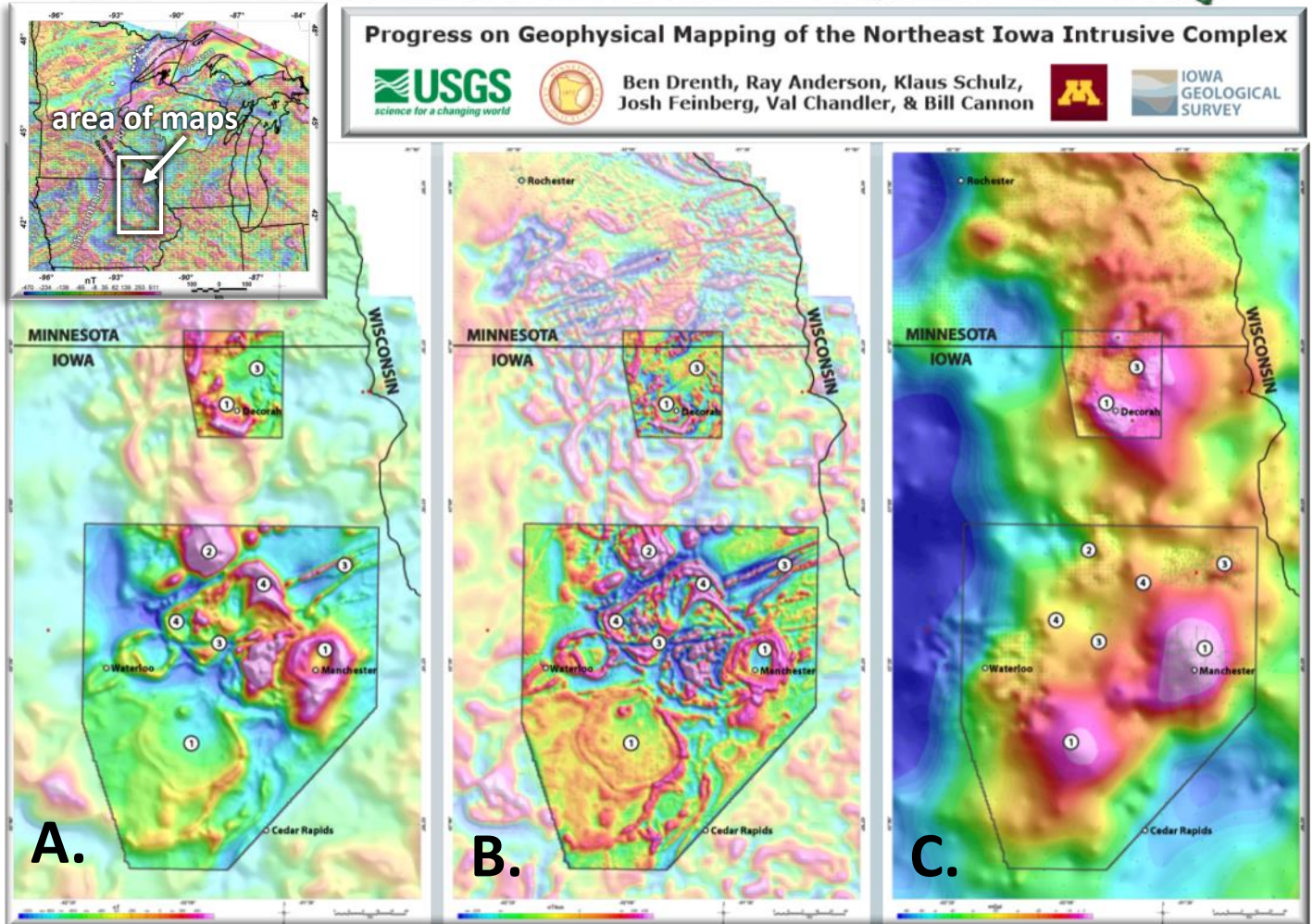
Magma (red-orange) rises from the Hawaiian hotspot, travels through a volcanic conduit to the summit of *Kilauea* where it can remain, erupt, or flow down the flanks of the volcano in the subsurface. Linear fissures — rift zones — that cut through the flanks of the volcano can facilitate both magma storage and eruption.

Kilauea is a currently active shield volcano in the Hawaiian Islands and the most active of the five Hawaiian volcanoes. In fact, *Kilauea*, located along the southern shore of the island, is the most active volcano on the Earth. Lavas younger than 1,000 years cover 90 percent of the volcano; the oldest exposed lavas date back 2,800 and 2,100 years. Its summit currently lies 4,190 ft above sea level. The first well-documented eruption of *Kilauea* occurred in 1823, and since that time the volcano has erupted repeatedly. Most historical eruptions have occurred at the volcano's summit or its southwestern rift zone, and are prolonged and effusive in character. Like all Hawaiian volcanoes, *Kilauea* was created as the Pacific tectonic plate moved over the Hawaiian hotspot in the Earth's underlying mantle. Following the pattern of Hawaiian volcanics, *Kilauea* would have started out as a young submarine volcano, gradually building itself up through subsurface eruptions of alkali basalt before emerging from the sea with a series of explosive eruptions about 50,000 to 100,000 years ago. Since then, the volcano's activity has likely been as it is now, a continual stream of effusive and explosive eruptions of roughly the same

pattern as its activity in the last 200 or 300 years. *Kilauea* has a large summit caldera, measuring 2 by 2.5 mi. with walls up to 400 ft. high, breached by lava flows on the southwestern side. *Kilauea* formed over several centuries, with its construction estimated to have begun about 500 years ago; its present form was finalized by a particularly powerful eruption in 1790. A major feature within the caldera is *Halemaumau*, a large pit crater and one of *Kilauea's* most historically active eruption centers. The crater is approximately 3,000 ft in diameter and 275 ft deep, and its form has varied widely through its eruptive history; the floor of the *Halemaumau Crater* is now mostly covered by flows from its most recent eruption, in 1974. Magma rising into *Kilauea Volcano* first enters a principal storage reservoir beneath its summit caldera. The magma may then erupt at the summit or move through one of two principle pathways (rift zones) beneath the flanks of *Kilauea* (arrows show direction). This movement of magma down the rift zones causes the summit area to subside, which is recorded by tiltmeters as an inward tilt of the caldera rim. When magma is not moving down one of the rift zones, the summit caldera inflates slowly as shown by an increase in ground tilt, indicating magma is rising into the summit reservoir. The remarkable tilt pattern at the caldera in the 1980's showed that the summit magma reservoir is often in delicate balance with the reservoir system beneath the east rift zone. The pattern of tilt at *Kilauea* helps determine when magma is on the move down one of the rift zones and when it might erupt. The shallow part of *Kilauea's* magma system is conceptually well understood. A near-vertical magma transport path exists beneath *Kilauea's* summit to a 12 mi depth. *Kilauea's* shallow magma system, established early in the volcano's history, has remained fixed in place. Studies of earthquakes have outlined a storage region at a depth of 2.5-4.5 mi from which magma is supplied for eruptions and intrusions. They also disclosed a decollement (a gliding plane between two rock masses) at 6 -7.5 mi along which the south flank of *Kilauea* is sliding seaward. Weakness along this zone provides paths for magma movement. To the casual observer, *Kilauea* appears to be part of the larger volcano *Mauna Loa*, but geological data indicates that it is a separate volcano with its own vent and conduit system. *Kilauea* has had more than 60 recorded eruptions in the current cycle, according to the U.S. Geological Survey, and has been erupting on a continuous basis since 1983. On May 3, 2018, the volcano erupted dramatically, several hours after a magnitude-5.0 quake struck the Big Island. The eruption spewed lava into residential subdivisions in the Puna district of the Big Island, prompting mandatory evacuations of the Leilani Estates and Lanipuna Gardens subdivisions. Hawaii's *Kilauea* volcano erupted anew before dawn on May 17, spewing a steely gray plume of ash about 30,000 feet into the sky that began raining down on a nearby town. The explosion at the summit followed two weeks of volcanic activity that sent lava flows into neighborhoods and destroyed at least 26 homes. Scientists said the eruption probably lasted only a few minutes.

modified from <http://www.geologyin.com/2018/05/whats-beneath-kilauea-hawaiis-most.html>

What's New In Iowa Geology ??



Ben Drenth (USGS Denver) has been spearheading a study of basement rocks in northeast Iowa. Since the basement (Precambrian) rocks lie about 2000' below the surface and only 2 wells have reached these depths, Ben and his colleagues have turned to investigating the geology using geophysics, carefully measuring and mapping the variations in the Earth's gravity and magnetic fields in the 2 study areas, highlighted on their most recent maps (shown above). Computer modeling of these data have helped them understand the nature of these rock . The maps include: **A.** reduced aeromagnetic anomaly; **B.** the first vertical derivative of the aeromagnetic map; and **C.** variations in the Earth's gravity field. All maps display high values in reds and oranges and low values in blues. The small numbers on white dots identify 4 specific features interpreted from these maps (presented as a poster by Ben and his fellow scientists at the 2016 Annual Institute on Lake Superior Geology

1. Ring-shaped magnetic highs paired with gravity highs: Thought to represent alkaline ring complexes or mafic anorogenic plutons where the central zones are weakly magnetized. Borehole near Decorah indicates a gabbroic source of the magnetic ring high.
2. Large magnetic high not directly correlated with a gravity anomaly: Thought to represent a large intermediate-composition pluton.
3. Numerous NE-trending linear magnetic anomalies: Thought to represent dikes, some normal and some reversed polarity. NE-trending dikes are consistent with expected trend of Keweenaw (i.e., Midcontinent Rift-related) dikes in this region. Apparent dikes variably cut, and cut by other units
4. Curved magnetic anomalies that may have different "layers." Reminiscent of magnetic anomalies over the Brule Lake-Hovland gabbros of the north-central Duluth Complex. Cuts normal polarity dike, is cut by apparent reverse polarity dike. Gravity coverage currently too poor to evaluate gravity signature.

The USGS has approved (when funding becomes available) the drilling of a deep research core to determine the true nature of the rocks below that have been currently modeled primarily using geophysical data.

How Birds May Have Escaped the Dino-Killing Asteroid Impact



RUN, BIRD, RUN Birds most likely to have survived a mass extinction 66 million years ago would have been small (as seen in this artist's depiction), able to fly and just fine living on the ground, researchers say

Nothing against trees, but maybe it's better not to get too dependent on them if you want to survive a big flaming space object crashing into Earth. The asteroid impact that caused a mass extinction 66 million years probably also triggered the burning of forests worldwide, a new investigation of the plant fossil record concludes. Needing trees and extensive plant cover for nesting or food could have been a fatal drawback for winged dinosaurs, including some ancient birds. Reconstructing the ecology of ancient birds suggests that modern fowl descended from species that survived because they could live on the ground, an international research team proposes in the June 4 *Current Biology*. "You probably would have

died anyway regardless of habitat," says study coauthor Daniel Field, an evolutionary paleobiologist at the University of Bath in England. "But if you could get along on the ground, you at least had a shot at surviving across this devastated landscape." The shock wave from the strike probably flattened trees within a radius of 1,500 kilometers," Field says. Wildfires ignited around the planet and then came the acid rain. Clouds of ash and dust may have darkened the sky for several years, and researchers suspect that photosynthesis waned. Yet some lucky birds, but no other dinosaurs, survived the hellscape. For clues to what made a survivor, researchers turned to fossilized pollen from before and after the fiery impact. Abundant kinds of flower-bearing and cone-bearing plants left pollen just before the asteroid hit and again starting about a thousand years afterward. In between those times of diversity, however, ferns dominated, the team notes. A kind of "disaster flora," ferns (making spores instead of flowers and seeds) do well at recolonizing land. Seed plants, however, weren't thriving. Analyzing evolutionary histories of modern birds supports the idea of tree dependence as a vulnerability for the earliest fowl, the researchers say. Specialists in bird evolution now generally agree on the lowest, oldest branches of the bird family tree, Field says. The bottommost one, for instance, includes such modern species as ground-dwelling ostriches and smaller, flight-capable birds called *tinamous*, which might be more like the ancient birds that dodged extinction. Working backward along these low branches, researchers used fossils and known bird traits to reconstruct the most likely lifestyles of the earliest survivors. These probably weren't tree-dependent birds, the researchers conclude.

The glory days of dinosaurs had had plenty of flying tree-dwellers. So far, paleontologists have identified at least 80 kinds of what are called "opposite birds," the *Enantiornithes*. "If you saw one flying around today, you'd say, 'Well, that's a bird,'" Field explains. Their feet looked like those of birds that perch on tree limbs, so he's not surprised that a fossil of an opposite bird from this probably arboreal group has never been found in rock formed after the dino doomsday. What did happen, however, was that when trees and forests came back after the disaster, birds quickly evolved arboreal lifestyles, the team says.

Many people don't realize that **birds almost died off during the mass extinction, too**, says paleontologist Stephen Brusatte of the University of Edinburgh who has studied bird evolution but was not involved in the new study. What let the few survivors squeak through, he says, has been a mystery for a long time. The whole scenario of a ground-dweller's advantage and then a return to the trees "makes a lot of intuitive sense." <https://www.sciencenews.org/article/how-birds-may-have-escaped-dino-killing-asteroid-impact?tgtnr>

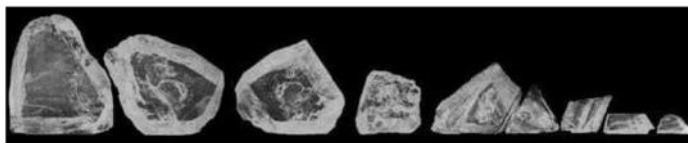
July 14 - TAKO "Rockin' Rocks and Fossils"

TAKO (Take A Kid Outdoors) is an organization based in Iowa dedicated to providing outdoor experiences to children and people of all ages. On Saturday July 14 TAKO will host their "Rockin' Rocks and Fossils" event at Klein Quarry from 9 am -12:00 noon. CVRMS members volunteer to assist this event. If wish to help contact Marv Houg at m_houg@yahoo.com or (319)364-2868.

--- see [Rockin' Rocks and Fossils](#) for more details



The largest gem-quality diamond ever discovered was the Cullinan diamond found in 1905 in South Africa. After cutting and polishing, the two largest pieces were 530 carats and 317 carats. Both are part of the British crown jewels.



Cullinan diamond pieces in the rough

The first known diamond engagement ring was from 1477, when Archduke Maximilian of Austria gave a diamond ring to his fiancée. However, diamond engagement rings didn't become popular until after 1867, with a discovery in South Africa that started a huge increase in the diamond supply.

Diamonds form in the Earth's molten mantle, and are brought up into the crust during small, violent volcanic eruptions. They remain behind in the volcanic kimberlite pipe that brought the lava to the surface. The ancient Hindus believed diamonds were created by lightning bolts that struck the Earth - although that would have been a huge lightning bolt, as kimberlite pipes are up to a kilometer wide!



Kimberlite pipe

It appears that diamonds have only formed three times in the Earth's history (3.3 billion, 2.9 billion, and 1.2 billion years ago) and that Earth no longer makes diamonds! Diamonds do occasionally arrive on meteorites; however, they are very rare and small.

As the hardest known material, diamonds can only be cut with other diamonds (such as diamond dust applied to a saw or polishing wheel) or, in more modern times, with a laser.

Lab created diamonds display the same chemical structure and physical properties as diamonds mined from the earth. Even professional gemologists can't tell the difference between lab created and mined diamonds without extensive testing using specialized equipment.

modified from: <https://store.sundropjewelry.com/blogs/news/april-birthstone-diamond-fun-facts>

The Largest Insect Ever Existed Was a Giant "Dragonfly"



Fossil of a *Meganeuridae*

The largest known insect of all time was a predator resembling a dragonfly but was only distantly related to them. Its name is *Meganeuropsis* (with a reconstructed wing length of 13 in, an estimated wingspan of up to 28 in, and a body length from head to tail of almost 17 in), and it ruled the skies before pterosaurs, birds and bats had even evolved. Most popular textbooks make mention of "giant dragonflies" that lived during the days before the dinosaurs. This is only partly true, for real dragonflies had still not evolved back then. Rather than being true dragonflies, they were the more primitive 'griffinflies' or *Meganisoptera*. Their fossil record is quite short. They lasted from the Late Carboniferous to the Late Permian (roughly 317 to 247 million years ago). *Meganeura* fossils were first discovered in France in 1880 then described and assigned its name in 1885 by Charles Brongniart, a French Paleontologist. Later in 1979, another fine fossil specimen was discovered at Bolsover in Derbyshire, England. *Meganisoptera* is an extinct family of insects, all large and predatory with a superficial appearance like today's odonatans (dragonflies and damselflies). And the very largest of these was *Meganeuropsis*. Its has two known species, with the type species being the immense *M.permiana*. *Meganeuropsis permiana*, as its name suggests is from the Early Permian. It was originally proposed that *Meganeura* was able to fly only because the atmosphere at that time contained more oxygen than the present 20%. Other explanations for the large size of *meganeurids* include a suggested the lack of aerial vertebrate predators allowed *pterygote* insects to evolve to maximum sizes during the Carboniferous and Permian periods, perhaps accelerated by an evolutionary "arms race" for increase in body size between plant-feeding *Palaeodictyoptera* and *Meganisoptera* as their predators. Another theory suggests that insects that developed in water before becoming terrestrial as adults grew bigger as a way to protect themselves against the high levels of oxygen.

<http://www.geologyin.com/2018/01/the-largest-insect-ever-existed-was.html>

"Bill's Big Bus Boogie" 2018

Milwaukee County Museum



The 2018 incarnation of **"Bill's Big Bus Boogie"** will take CVMRS members on a field trip to the **Milwaukee County Museum** on Sunday, **November 4, 2018**. The museum features the **Hebior Mammoth**, a fossil found less than 30 miles from the Museum on a farm in the small town of Paris in Kenosha County, that is among a group of important finds that help date the early presence of humans in North America. One popular display is **"Continents, Oceans and Life in Motion: A New View of the Third Planet,"** the first museum display in North America to use plate tectonics as a central theme for the presentation of earth science to the public. The Museum's 150,000 square feet of exhibit space also includes an opportunity to visit **Africa**, stroll through the bustling **Streets of Old Milwaukee** of a century past, witness a **modern-day pow-wow**, stroll amid free-flying butterflies from around the world in the **Puelicher Butterfly Wing**, and **more!** The temporary exhibit **"Maya: Hidden Worlds Revealed"** is open allowing visitors to rediscover this ancient civilization, view hundreds of authentic artifacts, and participate in hands-on activities such as exploring tombs or building an arch, & more. The club will pay for the bus, for those whose club membership dues are paid up as of May 1, 2018, and they need only pay museum admission. If the bus is not full by September 15, the trip will be opened to the public for \$25/seat. Registration for the trip is **now open**, so contact **Bill Desmarais** at **319-365-0612** or desmarais_3@msn.com if you are interested in participating. It should be another great **"Bill's Big Bus Boogie"** field trip!

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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 potluck 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:

**Dale Stout
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