Flatirons Facets

Flatirons Mineral Club of Boulder County, Colorado
Volume 66, Number 3 May-June 2023

Our first field trip of the year to the Edgar Experimental Mine in Idaho Springs. See the President's Message on page 2 for a recap of the trip. Credit: Karen Simmons

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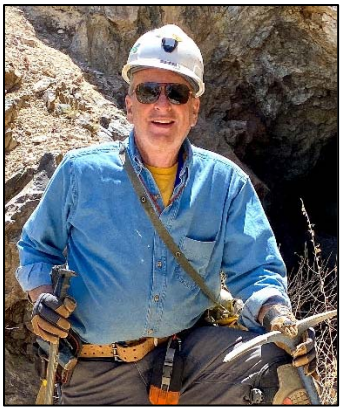


President's Message

It's field trips season! On April 28th, we took our first trip to the Edgar Experimental Mine which the Colorado School of Mines runs in Idaho Springs. I arrived early, having been concerned about a minor snowfall the previous night, and had the opportunity to chat with some of the mining engineering students. I asked them about job opportunities in mining and was impressed to learn that all the graduating students had at least three job offers. One student mentioned that he would be working two weeks in Alaska, followed by two weeks off either in Denver or at the company condo in Hawaii. It was interesting to learn that when the demand for minerals increases, so do the perks for those involved in the industry.

The Edgar Mine holds a special place in my heart as it brings back fond memories. During a CSM mining summer class I attended in 1983, I obtained my Mine Safety and Health Administration underground certification and also learned how to operate a single jack drill. Over the years I have visited various mines located in Colorado. In case you have ever seen my hard hat, each sticker represents a mine that I had visited.

During the Edgar Mine visit, the attendees gained knowledge about mining engineering, which involves the construction and operation of a mine. The Edgar Mine Manager, who happens to be a CSM mining engineering professor, shared valuable insights with the group. This trip marked the beginning of our field trip season and was a success.

In the upcoming club meeting on May 9th, William Rehm will be discussing the field trip lineup for 2023; however, we still need a few more field trip leaders. If you are interested in volunteering, please reach out to Will.

Best regards,
Brian Walko
FMC President

The Flatirons Mineral Club is a non-profit organization, which is dedicated to developing and maintaining interests in Earth science and associated hobbies. The purpose of this Club includes, but is not limited to, studying geology and Earth science, teaching others about our hobby, including young people, collecting gem, mineral and fossil specimens, and learning lapidary skills.

The Flatirons Mineral Club is affiliated with the Rocky Mountain Federation of Mineralogical Societies, the American Federation of Mineralogical Societies, and the Greater Denver Area Council of Gem and Mineral Societies.

Nominate a Rockhound of the Year

Each year, the club honors an active member or husband-and-wife team who has contributed to the success of the Flatirons Mineral Club. Our first Rockhound of the Year was honored in 2002, and each year since, a club member has been selected as our Rockhound of the Year by the club membership.

Recipients for this honor are first nominated by club members. Please consider nominating someone this year - perhaps someone who leads field trips, helps organize the club show, assists with club meetings, or helps with the Jr. Geologists. A nomination form can be found on page 27.

Please return your nomination to Gerry Naugle by **July 15**. It can be mailed to Flatirons Mineral Club, P.O. Box 3331 Boulder, CO 80307-3331, or emailed to Gerry at gnaugle@earthlink.net.

Dino Bone Wars at the May 9 Club Meeting

Gerry Naugle

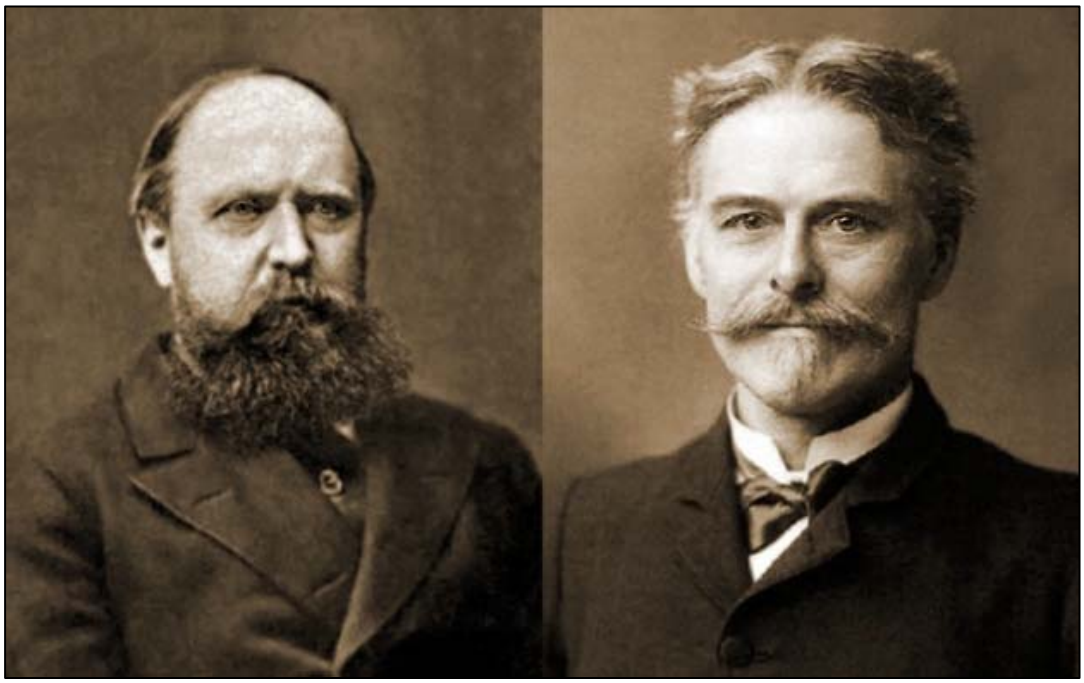
There are many aspects and angles within the topic of the west's **Dino Bone Wars**, which started in earnest in about the year 1870. A complete treatise on this subject would take at least four hours (and would be a mini-course), but we will keep it to one hour by hitting the high-points of the recent BBC feature article that was written by a BBC reporter from London (https://www.bbc.com/future/article/20230119-the-dinosaur-feud-at-the-heart-of-palaeontology). Realizing that she was taking the 35,000-foot view of the action on the ground that started around 1870, I will be able to fill in much more detail of the background going on (since we are local to it) than she possibly could.

We will hear her narration of her story from the BBC feature posted on their website. The term "wars' usually connotes a destructive situation, however in this case it was the competition between the two main characters here that actually initiated and evolved what we now call "the modern field of paleontology" as an important branch of science.

Hint: Before Marsh and Cope started, there were a few tens of dinosaur species that were named and recorded in the literature. After they concluded their "war," there were well over 1,100 species named. This is going to be a very interesting one hour, and you will take away many things that you may want to Google and read more about after the program.

See you on May 9th.

Credit: The BBC, and Ms. Martha Henriques



Othniel Charles Marsh (left) and Edward Drinker Cope (right). Credit: George Bird Grinnell and Marcus Benjamin, respectively, public domain

Club meetings begin at 7:00 pm in Barker Hall at Mountain View United Methodist Church, 355 Ponca Place in Boulder. Park in the west parking lot and come through the main entrance of the church. Following the signs down the stairs to Barker Hall.

FMC 2023 Field Trip Season – Come to the May 9 Meeting

Will Rehm

It's time to kick off the 2023 field trip season, and this year we prepared a catalog with all the trips we have planned. Thanks to everyone for your field trip ideas- they really helped.

Some great trips are coming, so please check out the catalog at the end of this newsletter, then watch your email inbox for announcements about each one. We'll be discussing the trips at our upcoming May 9th meeting and have detailed some of the upcoming ones in May and June below.

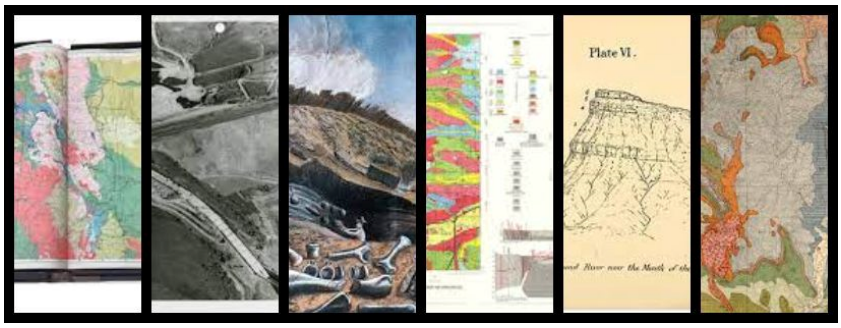
The first trip on our 2023 list has already been completed, a rather epic visit to the Colorado School of Mine's Edgar Experimental Mine, led by our club President, Brian Walko. Check out Brian's summary of the trip in his President's Message on page 2 of this newsletter.

Our upcoming trips in May and June should be a lot of fun. Please watch your email inbox for announcements, and please refer to the Field Trips section of our website for the most current and accurate information about all field trips.

May 20 CU Boulder Map Repository

Our next field trip is especially interesting. On May 20th we'll visit the CU Boulder Earth Sciences & Map Library for a private tour of their massive map library. The CU map collection holds over 200,000 maps, including old mine maps, historic maps, and the complete collection of all USGS maps. The library has BLM maps, Forest Service maps, international maps, and an archive of aerial images of Colorado from the 1930s up to today. If you like maps, use them, or are simply curious about them, this trip is for you.

CU's Map Librarians will explain their holdings, bring out maps that have been curated for our visit, and show us how to research topics using their resources. Their team will bring out maps for us, such as maps by Hayden, illustrations by Arthur Lakes, maps of the Marshall coal fields, old mine wall maps, and more. It should be lots of fun.



June 10 Idaho Springs "Double-Header"

June 10th is the date for an Idaho Springs spring "double-header" field trip to both the Phoenix Gold mine (a hardrock gold mine) and the Argo Mill and Tunnel, which processed gold ore from many famous mountain mines. Yes, there will be gold panning, which is always fun. Please stay tuned for details.

June 25 Hartsel Barite

June 25th has us traveling to Hartsel Colorado, to collect Barite. Led by Anita Colin, the Hartsel trip is always a club favorite. Details for the trip are being worked out now, so please watch your inbox. Interesting fact: Samuel Hartsel - namesake of the town - came to the area to mine but found more money in ranching.

Wanted: Field Trip Photos

During field trips this summer, consider taking photos during your trip and of your best finds for future newsletters. Please send your best ones to Dennis Gertenbach at gertenbach1@gmail.com.

Sun Protection on Field Trips

The season for field trips and other outdoor activities is here. Protect yourself from sun exposure by following these steps.

Credit: Center for Disease Control and Prevention, public domain

Where in Colorado?

Each month, we test your knowledge of geological features in Colorado. This month's location is one of Colorado's most important archeological sites, located in Colorado's Front Range near the Wyoming border. Where in Colorado is this?

See page 14 for the answer.

Member Profile: Charlotte Bourg

Anita Colin

Char pretty much started rock collecting as soon as she could walk. Her father was a serious rockhound and family vacations were spent in search of interesting minerals. She lived in Nebraska, but made many trips to Colorado, both as a child and as an adult. Her guiding principle in life: Time spent collecting and working with rocks is never wasted.

Char attended an art academy as a teenager and worked at an art store after graduation. There she met her future husband, Mel, and swept him off his feet and into the world of rocks. She spent much of her career as an artist, doing commercial art and later working on stained glass windows and other types of glass artwork.

Char and Mel eventually bought a plot of land in Colorado, between Buena Vista and Salida, and built a house for themselves. “This area is rock-hounding paradise. Just about anywhere you go in the foothills or mountains, there is a plethora of rocks to collect,” Char noted. Her most exciting trip was to Mount Antero, where she found a pocket of smoky quartz that made it worth the "exhilarating" drive up.

In 2006, they moved up to Loveland and joined the Flatirons Mineral Club. Over the years, they have belonged to several rock clubs and say that FMC has been the most welcoming. It is also the only one they have encountered that has an active juniors’ club. “Families are an investment in the future of the club,” says Char. As the head of the children’s area at FMC’s December show, she loves engaging kids and their parents with matching games, prizes, and grab bags.

In addition to our annual show, Charlotte and Mel contribute to FMC in many different ways. They lead field trips and collect specimens for grab bags. They help organize our annual picnic, silent auction, and towel show. Char also serves on our board of directors and sews hundreds of grab bags every year. If she ever decides to "retire" from the club, we will need a whole busload of people to replace her!

A sample of Char’s artwork

A Fish Tale, Part 1 – Good Karma!

Nancy Kimber

I thought you would enjoy a story about one of my recent finds. In 2021, my son Nick and I spent the July 4th weekend in Kemmerer, Wyoming – at the American Fossil Quarry, to be specific. The area is home to Fossil Butte National Monument and is famous for preserving fossils from the Eocene Green River Formation, Fossil Butte Member. About 52 million years ago, Fossil Lake was filled with fish. Today, with luck, we find excellently preserved specimens. It is about 450 miles from my home in the Denver, Colorado suburbs, so it is pretty much a full day drive there and a full day drive back. It was well worth it this time!

Both halves of the large *Phareodus encaustus* fossil fish I found. Note dollar bill for size.

If you've collected in Kemmerer, you know the process. If not… You start with a big, thick slab of shale. Then, you're supposed to split the slab in half, then half again, etc. On our last day there, around midday, I started on a big slab. I hadn't found anything in the first half, so I was getting ready to give up on the rock and go eat lunch. One more split... I may have screamed "holy s**t" at the top of my lungs. The entire population of the quarry descended on me to see what I found. It was a *Phareodus encaustus*, pretty much complete but in need of prep. Apparently, it was the second biggest one they had seen so far that season!

Closeup of the teeth of my find.

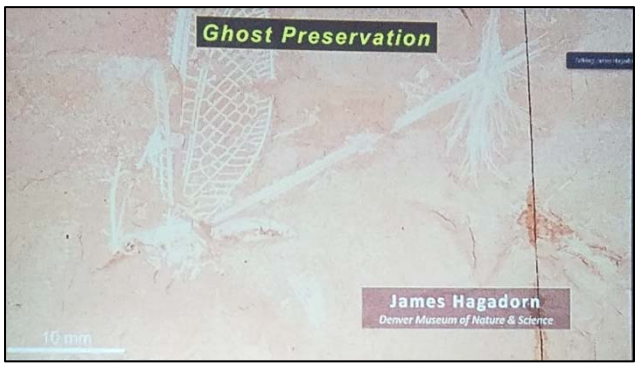
For the least chance of breakage, you're supposed to move slabs vertically. However, when my car is in camping mode, there is literally no place to transport a big slab this way. So, I had to think about how to safely transport the beast horizontally.

We left the fish in the quarry storage shed overnight. That evening, we went into town to get packing supplies – bubble wrap and strapping tape. The next morning, instead of taking down the tent and packing everything into my car, we did the opposite – we left the tent up and moved stuff out of my car and into the tent to make room. Next, we went into town to get 2 OSB backer boards. Then, we went back to the quarry, and spent 2 hours photographing and wrapping the fish into the biggest fish sandwich you've ever seen. We

loaded the fish into my car, and drove VERY carefully on the bumpy (because, of course it is) dirt road out of the quarry. Almost done, we went back to town, arranged for the fish to be prepped (because in my wildest dreams, I am not qualified to do it) and dropped it off. Finally, we went back to get the tent and other stuff and pack my car. Whew! I guess I used up my good karma because, on the way back, Johnson's Corner (a much-loved truck stop south of Fort Collins, Colorado) was OUT of cinnamon rolls. That is just plain wrong!

This would be an amazing find in any case, but I was extra happy to find it when I did. It gave me something funny to write about as part of my September 2021 President's letter for the WIPS newsletter, *Trilobite Tales*. I returned to Kemmerer in July 2022, and picked up the fully prepared fish. Stay tuned for the next newsletter for part 2 of this epic fish tale!

Ghost Fossils, Turtle Compaction, and Anemone Fossils at Our March Meeting



James Hagadorn was our speaker at our March 14 meeting, where he talked about several outstanding paleontological discoveries from museum specimens. During his Zoom talk, James was asked about access to some of the papers and other information about his paper. He kindly provided these links.

- The paper on Jellies-are-really-Anemones: https://onlinelibrary.wiley.com/doi/10.1002/spp2.1479
- The Tiktok about the above paper: https://www.tiktok.com/t/ZTR7A1b21/
- The paper on Turtle Compaction Index: https://pubs.geoscienceworld.org/gsa/geosphere/article/18/5/1524/616297/Crushed-turtle-shells-Proxies-for-lithification
- His YouTube playlist, where every other Friday a new "Sixty Seconds of Science" video is released: https://tinyurl.com/4c49bj74

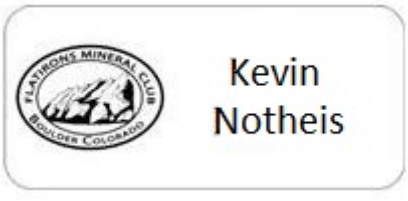
Specimen Bagging Party on June 13

On Tuesday, June 13, is our annual specimen bagging party for the grab bags in Barker Hall at Mountain View United Methodist Church (our regular meeting place). There will be refreshments and prizes. All are welcome.

Member Name Tags

Would you like a Flatirons Mineral Club name tag to wear at club events and field trips? The club places orders for name tags several times a year for members.

If you would like a name tag, please log onto our website and choose the "Request a Name Tag" link in the Members Area. Add your name to the list as you want it to appear on your name tag, and it will be ordered for you. Your first name tag is free.



Example of a club name tag

History of *Opabinia*

Charlotte Small, Age 15

Opabinia was one of the most unique-looking arthropods in the Cambrian. It was an ancient marine arthropod from the Burgess Shale of British Columbia, and it lived approximately 505 million years ago. Although there are fewer than 20 known specimens, it is a popular Cambrian fossil, with more than 60 publications about it. However, because soft-bodied animal fossils are so rare, it is very difficult to obtain facts about *Opabinia*.

Opabinia were 4-7 centimeters in length, and they had 5 protruding eyes. It had a tail with 3 longer fins on each side and two spikes. The *Opabinia* used its long claw-like proboscis to scoop up food from the bottom of the ocean. It might have even been used to reach into burrows. However, it is unknown whether the *Opabinia* crawled on its lobes or swam by flipping its body in a wavelike motion. It is assumed to have calcite eyes like trilobites; however, this is not backed up by any evidence. The more reasonable idea is that *Opabinia* did not have compound eyes, and they would have only been able to see dark shadows. (*Opabinia* had 5 eyes, which gave them almost 180 degrees of sight.) Like trilobites, *Opabinia's* body was split into 3 segments; head, thorax, and tail. Unfortunately, the *Opabinia* went extinct in the Devonian, 200 million years before the Permian extinction.

Drawing of an *Opabinia*. Credit: Charlotte Small

In 1911, Charles Walcott found 9 complete *Opabinia* specimens, and later in 1912, he published a description of it. He named it *Opabinia regalis* after Opabin pass in British Columbia. Later in 1966, Harry Whittington found another complete specimen. However, when he presented it to the Philosophical Transactions of the Royal Society, the audience didn't take it seriously. In the early 1970's there was a controversial debate about whether multi-celled animals existed in the Cambrian. However, after Whittington's presentation, they concluded that multi-celled animals did exist back then, and that the Cambrian was just a period of fast evolution.

In the beginning, Walcott's classified it as an anostracan crustacean, and as the idea spread, other paleontologists started reconstructing it. In 1930, Evelyn Hutchinson modeled the *Opabinia;* however, he thought it swam upside down. This was because *Opabinia*'s digestive system is curved in a U. Despite many paleontologists reconstructing it through the years, they didn't get a close answer until 1986. At this time, a Swedish paleontologist noticed the similarity of *Opabinia* to *Anomalocaris*, another Cambrian arthropod. It shared several features like gill flaps, big upright eyes, and front appendages. Now, *Opabinia* is classified as a stem group to the Radiodonta. (The clade Radiodonta includes *Anomalocaris.*) However, *Anomalocaris* probably preyed on *Opabinia*. Nevertheless, paleontologists are still unsure exactly how the *Opabinia* swam.

Opabinia was a very bizarre creature that puzzled paleontologists for many years. Both *Opabinia* and *Anomalocaris* are not directly related to any living animal today, which means it is very difficult to model these animals. This is a good

example of the struggle paleontologists have with soft-bodied animals. (Soft-body fossils are very rare, and often not clear.) It took them a total of about 100 years to classify it, and who knows, maybe the *Opabinia* isn't a radiodont!

Credits

- Briggs, Derek E. G., "Extraordinary fossils reveal the nature of Cambrian life: a commentary on Whittington (1975) 'The enigmatic animal *Opabinia regalis*, Middle Cambrian, Burgess Shale, British Columbia," Royal Society
- Prehistoric Wildlife, "*Opabinia*"
- Raptor Chatter on Youtube
- Wikipedia, "Opabinia"

Cool facts

- Tardigrades might be the closest living relative to the *Opabinia*.
- It lived on the floor of the sea and used its proboscis to sweep up food from the floor.
- In 1996, Graham Budd found what he thought to be *Opabinia* legs, however, he had not found an *Opabinia*, he had found a *Kerygmachela*, an arthropod that had existed 10 million years earlier. This shows that *Opabinia* were very closely related to other arthropods, even though it was a soft-bodied animal.
- When Whittington presented his idea in 1966, his audience laughed.
- The mouth of *Opabinia* was upside down, so the digestive system has a U-shaped bend in it near the head. Paleontologists are unsure what benefit this had.
- The fossils in the British Columbian Burgess Shale were buried by a landslide in the Cambrian.
- There is only one known species of *Opabinia* - *Opabinia regalis*.
- It was assumed that *Opabina*'s eyes were compound calcite like trilobites; however, this is not backed up by any evidence.
- Whittington's publication led to a surge in the publications of soft-bodied arthropods.
- All *Opabinia* fossils were found in the Phyllopod bed in the Burgess Shale in the Canadian Rockies of British Columbia.
- It is the 357th year of the Philosophical Transactions of the Royal Society.
- Whittington studied at Harvard, where he became a trilobite expert.

Bidding on their favorites at this year's Silent Auction.
Credit: Dennis Gertenbach

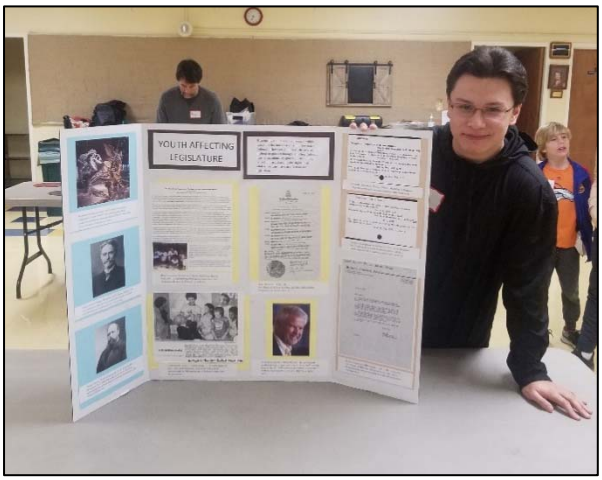
Silent Auction Recap

Last month's Silent Auction was a great success. The club had accumulated major parts of several collections during the past few years, so the club had a lot to offer for sale. Over 50 people came to the auction to bid on nice minerals, fossils, lapidary material, rockhounding books, and tools. After all sellers were paid for their split, the club
netted $686.83 to support our activities.

Many thanks from the FMC Board to those who helped organize and put on this year's auction.

Jr. Geologists Activities

Each month the Jr. Geologists meet for a fun, educational program. We kicked off March's meeting with a presentation by Maxwell, one of our older GeoExplorers, talking about how *Stegosaurus* became the Colorado state fossil. It was through the efforts of 5th graders and their teacher, Ruth Sawdo (a Flatirons Mineral Club member), that Governor Lamb decreed *Stegosaurus* as our state fossil.



After the presentation, Caren Johannes and Howard Gordon taught the Jr. Geologists how to make jewelry from polished rocks using wire wrapping. Caren worked with the older GeoExplorers on advanced techniques, while Howard showed the younger members a simpler procedure. Everyone enjoyed making jewelry to take home.

Clockwise from the top: Maxwell with his presentation about how Stegosaurus became the Colorado state fossil; Caren Johannes helps a Jr. Geologist with his wire wrapping; Jasmine and Ella with their wire wrapping creations; Howard Gordon shows how to make a simple wire wrapping. Credit: Dennis Gertenbach

Earth resources was the theme of April's meeting. We learned about how many of the things we use every day come from minerals and other resources from the Earth. As homework for the meeting, each member made a list of household items that come from minerals. They also learned about Earth science careers from three adult leaders. Everyone at the meeting completed the requirements for their Earth Resources badge.

Also, each month the Jr. Geologists have started the next step in polishing rocks in a rock tumbler, and the rocks are tumbled between meetings. In April, they added the polish and the rocks will be finished for the May meeting to distribute to everyone.

Clockwise from the upper left: The Jr. Geologists work with Tony Bubb adding polish to the tumbled rocks; Howard Gordon shows different minerals that are used to make things we use every day; Gerry Naugle shows fossil fish; the Jr. Geologists perform an experiment showing how nickel is recovered with Dennis Gertenbach. Credit: Rebecca Stetson

May's meeting will be volcano night, where we learn about volcanos, earthquakes, and plate tectonics. The highlight will be shooting off their volcanos (outside, of course).

Meetings start at 6:30 in Barker Hall (downstairs, north end) at the Mountain View United Methodist Church, 355 Ponca Place in Boulder (80303). Come into the church through the main doors from the west parking lot.

If your family would like to join the Jr. Geologists and you are not on our email list, please contact Dennis Gertenbach at gertenbach1@gmail.com to have your name added.

Gem Minerals: Nature's Bling
Denver Gem and Mineral Show, September 15-18, 2023

Anita Colin

The theme for the 2023 Denver Gem & Mineral Show and the Hard Rock Summit is "Gem Minerals: Nature's Bling." Not only will there be displays of the classic gemstones, but also there will be all manner of beautiful specimens including turquoise, rhodochrosite, agates, jade, coral, and pearls. Plan to attend! The shows run from Friday through Monday, September 15-18 from 9 AM to 6 PM at the downtown Denver Colorado Convention Center. Our club table will need volunteers to engage visitors with our rock-matching games and give out free specimens. Volunteers get entry to both shows as well as reimbursement for parking or bus fare.

What are gems made of? Most minerals classified as "gems" are especially hard. Although they can be faceted, their surfaces resist scratching. Diamond (pure carbon) is by far the hardest, being three times harder than the next hardest mineral, corundum.

Corundum is an aluminum oxide mineral with many industrial uses. Specimens that are clear and have distinct colors are known as rubies and sapphires. Beryl is a related gem mineral that includes aquamarines and emeralds. Beryl is a beryllium aluminum oxide and a bit less hard than corundum. A beautiful pink variety of beryl was named morganite (after J.P. Morgan).

Other minerals that are softer than corundum, but still considered gems, are topaz, a fluorine-aluminum silicate, and epidote, a greenish iron-containing silicate. Olivine, an olive-green magnesium iron silicate, can form transparent crystals called peridot. Tourmaline is a complex cyclosilicate, with a wide range of fabulous colors, including blue, green, and pink.

Even the common quartz (silicon dioxide), can be considered a gemstone. Amethyst, the purple form of quartz, is ranked among the lesser gems. Opal, which is a hydrate of quartz (it contains water in the crystalline structure) and Herkimer "diamonds" are other examples of quartz "gems".

Amethyst crystal from Four Peaks, Arizona.
Credit: Dennis Gertenbach

Where in Colorado

Dennis Gertenbach

Overlooking the Lindenmeier archeological site in Soapstone Prairie Natural Area.

Along this arroyo is the Lindenmeier archeological site, a place that changed our understanding of human occupation in North America. It is located in the Soapstone Prairie Natural Area along the Wyoming border north of Ft. Collins. This open space park is owned by the city of Ft. Collins.

The story of this remarkable site begins in 1924. The Coffin family began exploring this area along an arroyo on the northern edge of William Lindenmeier's ranch. Family members were geologists and amateur archeologists, looking for arrowheads and other Indian relics. At the site, they discovered fluted points, very different from the abundant, smaller arrow points they were familiar with elsewhere in the area. Over several years, the Coffins found 34 of these strange points.

Although archeologists recognized these fluted points as unique, their significance to archeology was unknown at the time. A few years later, scientists from the Colorado Museum of Natural History (now the Denver Museum of Nature and Science) found similar points near Folsom, New Mexico, giving them the name of "Folsom points." Folsom points are beautifully crafted stone tools, with a distinctive groove (also called a flute) along their long axis for attaching a shaft. Folsom points were used to hunt large game such as bison, pronghorn, and deer, and probably also served as knives.

At the time of these discoveries, most archeologists thought that the earliest date humans arrived in North America was 3,000 to 4,000 years ago. The discovery of Folsom points in New Mexico, accompanied by Pleistocene mammal bones, suggested that humans had been in North America much earlier. But there was no definitive proof and a debate raged. Vigorously leading this debate (on the side of 3,000 to 4,000 years of human occupation) was the Smithsonian Institute. Scientists hoped to find additional Folsom sites to provide more conclusive evidence.

After contacting several archeologists about their finds, the Coffins convinced Dr. Frank Roberts of the Smithsonian Institution to visit in 1934. Based on Roberts' initial survey of the site, detailed archeological excavations under his direction began in 1935 and continued through 1940. The site became known as the Lindenmeier site, named after William Lindenmeier, the landowner at the time.

The archeologists dug a number of trenches to uncover stone tools, animal bones, and other artifacts, which were interpreted as an ancient campsite and associated bison kill. The site was inhabited primarily

Smithsonian crew working at the Lindenmeier site in 1937.
Credit: Smithsonian Institute, public domain

A cast of the bison vertebra with a broken Folsom point tip (circled) discovered at the Lindenmeier site. This artifact proved that humans had arrived in North America more than 10,000 years ago. (Note that the sign is incorrect in referring to this as a "vertebrae," as "vertebrae" is plural for more than one vertebra.)

by a group of Paleo-Indians referred to as the Folsom people. The Lindenmeier site is one of the largest Folsom sites found in the Great Plains and Rocky Mountains.

The most important discovery at the site was found by crew member Loren Eiseley. He uncovered a vertebra of an extinct bison, *Bison antiquus*, with the tip of a Folsom point embedded into it. The Folsom point had been driven into the animal and then broken off. As *Bison antiquus* was known to have gone extinct over 10,000 years ago, this was proof positive that humans had occupied North American long before 3,000 to 4,000 years ago. Subsequent radiocarbon analysis of charcoal samples dates the site at approximately 12,300 years ago.

The Lindenmeier site can be visited in Soapstone Prairie Natural Reserve. From the parking lot it is a short walk on a paved trail to a shaded overlook. The overlook has several interpretive signs explaining the history of the area and the plants and animals found here, along with expansive views of the park.

For additional information about the discovery and history of the Lindenmeier site, see https://coloradoencyclopedia.org/article/lindenmeier-folsom-site and https://fcmod.org/wp-content/uploads/2013/lindenmeier.pdf.

Worth Visiting in the Area

The Soapstone Prairie has much more to see than just the Lindenmeier site. With over 28 square miles of nearly pristine grasslands, it has miles of trails to enjoy. Bison, pronghorn, golden eagles, elk, mule deer, coyotes, and jackrabbits call this home.

One of the many interpretive signs at the Lindenmeier site overlook.

Soapstone Prairie is also a unique geological site. A description of the geology and a guided geological tour can be found in the excellent book, *Geology Underfoot along Colorado's Front Range*, by Lon Abbott and Terri Cook. In this book, the authors discuss the Gangplank, a sloping geologic feature in northern Colorado and southern Wyoming that contains Oligocene and Miocene formations created from the erosion of sediments from the early Rocky Mountains mixed with enormous amounts of ash from the massive Ignimbrite Flare-up volcanos to the west. The geology exposed at Soapstone Prairie is helping to resolve another ongoing controversy – the history of the Rocky Mountains.

Soapstone Prairie is open daily from dawn to dusk in March through November; it is closed in December through February. Dogs are not allowed in the park. For park information and directions, see https://www.fcgov.com/naturalareas/finder/soapstone. A brochure with a trail map can be downloaded at https://www.fcgov.com/naturalareas/files/soapstone-prairie-natural-area-brochure-web.pdf?1618921768.

The Gangplank, exposing the White River Group, Arikaree Formation, and Ogallala Formation in Soapstone Prairie.

Fossils in the News

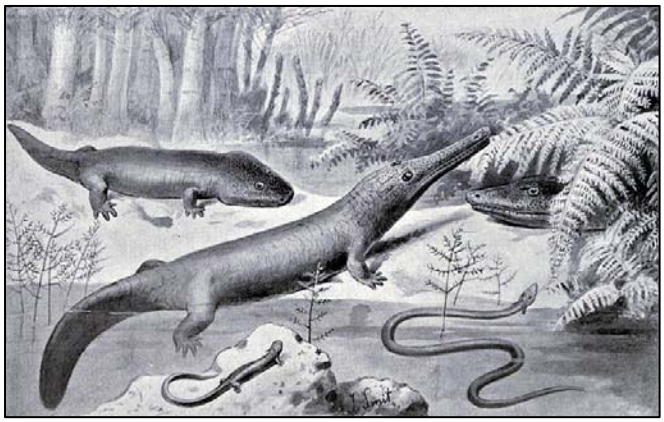
Did Flying Dinosaurs Hunt Like Modern Hawks?

It is pretty much accepted by paleontologists that modern birds evolved from dinosaurs. But questions remain if small, feathered dinosaurs like *Microraptor* flew. Researchers at the Chinese University of Hong Kong examined thousands of *Microraptor* fossils still embedded in rock that show soft tissue impressions. Specifically, they examined fossilized impressions of toe pads using laser technology that causes nearly invisible soft tissue impressions to fluoresce.

Artistic restoration of Microraptor gui. Credit: Fred Wierum, licensed under the Creative Commons Attribution-Share Alike 4.0 International

The shape of toe pads is indicative of the lifestyle of modern birds. Predatory birds have protruding toe pads with spiky scales for grasping prey, while walking and running ground birds have flatter toe pads. The researchers found that *Microraptor* toe pads were more similar to predatory birds like hawks. Other researchers caution that this does not prove that *Microraptor* was an aerial hunter but implies that they may have hunted like modern hawks.

Information from https://www.sciencenews.org/article/dinosaur-microraptor-hawk-fossil-foot?utm_source=email&utm_medium=email&utm_campaign=latest-newsletter-v2



Rapid Recovery from Earth's Deadliest Mass Extinction

Most of us are familiar with the mass extinction at the end of the Cretaceous Period that wiped out about 75% of the animals and plants on Earth, including the dinosaurs. However, this was not the deadliest mass extinction. That happened earlier at the end of the Permian Period, when over 90 percent of the plant's species perished.

Permian animals that went extinct at the end of the Permian Period. Credit: Joseph Smit, 1910, public domain

Paleontologists theorized that it took millions of years for marine ecosystems to recover. However, newly discovered pristine fossils found near the city of Guiyang in

southern China indicate otherwise. Fossils of a primitive lobster, predatory fish as long as baseball bats, ammonoids in swirled shells, eel-like conodonts, early shrimp, sponges, bivalves, and even coprolites (fossilized poo) were recovered. Uranium dating places the rocks where these fossils were found at 250.7 to 250.8 million years ago, just a million years after the Permian extinction event. Called the Guiyang biota, these fossils show a thriving marine ecosystem had re-established itself a short time (geologically speaking) after the massive die-off.

Information from https://www.sciencenews.org/article/historys-deadliest-mass-extinction-ocean-life?utm_source=email&utm_medium=email&utm_campaign=latest-newsletter-v2

Fossil Bird Helps Reveal How Dinosaurs Became Birds

Paleontologists have few fossils that provide details about how dinosaurs evolved into birds. However, a newly discovered 120-million-year-old fossil bird found in China helps to fill some of this gap. The dove-sized *Cratonavis zhui* had a body similar to modern birds, but with a dinosaur-like head. CT scans of the fossil revealed that *C. zhui* had a skull that was nearly identical (but much smaller) to theropod dinosaurs like *Tyrannosaurus rex*. But unlike carnivorous theropods, the small, dinosaur-headed bird most likely ate beetles, grasshoppers, and an occasional lizard, rather than terrorizing the planet as a flying *T. rex*.

Reconstruction of *Cratoavis*, a bird with a dinosaur-like head. Credit: Johnny Mingau, licensed under the Creative Commons Attribution-Share Alike 4.0 International

Information from https://www.sciencenews.org/article/bird-trex-reveal-dinosaurs-fossil-paleontology?utm_source=email&utm_medium=email&utm_campaign=latest-newsletter-v2

Cambrian sea life. Credit: Smithsonian Institute, public domain

Fossils from Wales Reveal Early Animal Life

Scientists have found a trove of 170 species of tiny marine fossils in Wales that date to around 462 million years ago. These well-preserved fossils show life near the beginning of the Ordovician Period, a time at the start of the Great Ordovician Biodiversification Event. The animals have preserved soft tissues, including digestive systems, eyes, and brains.

The site shows a mix of fossil types. Some earlier Cambrian animals were found, including the five-eyed *Opabinia* (see page 9) and the spiny, slug-like *Wiwaxia*. Also present were animals still found today, such as ancestors of worms, sponges, barnacles, starfish, and horseshoe crabs. This unique site provides paleontologists with a picture of the transition from Cambrian animals to Paleozoic animals, many of which still exist today. The site changes previous thinking about ancient life; some Cambrian animals lived later in the Ordovician, while other Paleozoic animals evolved earlier than previously known.

Information from https://www.smithsonianmag.com/smart-news/this-trove-of-fossils-in-wales-is-revealing-secrets-of-early-animal-life-180982095/?utm_source=smithsoniandaily&utm_medium=email&utm_campaign=editorial&spMailingID=48274850&spUserID=NzEwMTQ4NzQ2NTg1S0&spJobID=2460514041&spReportId=MjQ2MDUxNDA0MQS2

Come to Casper for the Rocky Mountain Federation Convention
July 14 through 16, 2023

The Rocky Mountain Federation of Mineralogical Societies (which our club is a member) rotates their annual convention to different states in the Rocky Mountain region. This year's convention is in Casper, Wyoming, held in conjunction with the Natrona County Rockhounds Show and Convention. The show features rough rocks, gems, minerals, lapidary and rock hounding equipment and supplies, and hand-crafted jewelry by vendors from numerous states. There will also be displays, games, silent auctions, door prizes, and events for adults and children. Several field trips are planned, including trips to collect Sweetwater agates, petrified wood and botryoidal agates from the Shirley Basin, and prairie agate and banded iron.

The convention packet containing the schedule, registration form, and hotel information can be downloaded at https://www.rmfms.org/_files/ugd/da64e5_1c3e9cc71c3c4a84a45862511f52ad01.pdf. This is a wonderful opportunity to increase your knowledge about federation and their role in supporting rock hounding, geology, and lapidary arts. Plus, it will be great fun!

Come to Billings for the American Federation Convention
August 3-6, 2023

An even larger show will take place in August at the American Federation of Mineralogical Society (AFMS) Convention. Each of the regional federations (including our own Rocky Mountain Federation) will convene in Billings, Montana, this summer in conjunction with the Billings Gem and Mineral Show – Montana Treasures.

This special regional and national show will feature vendors and exhibits of gems, crystals, minerals, fossils, artifacts, agates, jewelry, and more. There will be raffles, silent auctions, and lots of fun events for kids!

You can download a registration form at http://northwestfederation.org/documents/Show/Archives/2023/2023AdvanceRegistrationForm.pdf. More information about the show will be posted on these website this summer: https://billingsgemclub.com/rock-shows/2023-show and http://northwestfederation.org/FederationShow.asp.

And here is a sample of the Montana Treasures you can enjoy during your stay in Billings.

Billings — Here We Come! — The Treasure State, Part 2

Cheryl Neary, AFMS President
(Reprinted from A.F.M.S. Newsletter, Volume 76, Number 4, May 2023)

As you surely know, this year's AFMS convention will be held in Billings. I should also add Montana, since there are five other states in the USA that have a place called Billings. The other cities of Billings are in: West Virginia, Oklahoma, Michigan, Missouri, and New York.

Photo by Ron Reiring, A Look at downtown Billings, Montana, CC-GA-2.0

It would only take me a few hours to travel to the Billings, New York location, since it is in Dutchess County, east of the Hudson River and east of the Taconic Parkway in the lower southeast part of the state. I live on Long Island, so if you are familiar with the geography of the Empire State, you can see it is not too far! Billings, New York has an Alpaca farm!

Billings, Montana will be a three-day journey for me - a bit of a difference! This Billings has a bit more to offer. It is not only a city, but the largest city in Montana and has much more to offer than the namesake in New York.

In this article I will be talking about the Rims, so buckle up!

The following information is from the application for National Register of Historic Places Registration Form - **Black Otter Trail** at https://npgallery.nps.gov/NRHP/GetAsset/96be4fe7-b5a5-43cf-9b01-8d0082c272ba

Billings is also known as the **"Rim" or "Rimrocks"** for the sandstone formations around it, north of the Yellowstone River. The formation is composed of Eagle Sandstone, deposited over 60 million years ago as the inland sea receded eastward during the Cretaceous Period. Weathering of the Eagle Sandstone creates the steep valley wall.

Swords Rimrock Park is a great way to explore this geological structure, providing breathtaking views and historic icons. The park is approximately a five-mile ride to the Yellowstone River.

The rim-top lands were deeded to Billings by George Swords in the late 1920s and then again in the early 1930s. George Swords was a civic leader in Billings, who donated the lands with a covenant that the land be used for park and recreational purposes.

There are over two miles of paved trails. The road that runs through the park was named in honor of late Crow Indian Chief Black Otter, who was killed in 1861. He is interred near the high point of the park, close to the present location of "Yellowstone" Kelly's grave.

Photo by Sara Goth, Billings, Montana Swords Park Trail, CC BY-SA 3.0

Anchoring the trail on the eastern side is the **Boothill Cemetery**, which was placed on the National Register April 17, 1979. This cemetery was from the early settlement of Coulson, Montana, which was in the Clark's Fork Bottom. On the western side of the trail is the Billings-Logan International Airport. The Trail also provides multiple views of the Yellowstone Valley, the City of Billings, and numerous mountain ranges.

Under the New Deal's Works Progress Administration (WPA), construction of the roadway began in March of 1936. All labor by the 150 men assigned to the project was by hand. Two months later, due to cutbacks in funding, the project was halted until the Billings City Council adopted the project and the roadway was completed in 1938.

A primary historic site is **Luther S. "Yellowstone" Kelly's grave site**. "Yellowstone" Kelly, a famous Montana explorer and scout, requested that his remains be buried in Montana. In July 1929, Kelly was buried on a high point on the rimrocks, overlooking the Yellowstone River Valley.
Born in New York in 1849, Kelly joined the Army during the Civil War. He came to Montana Territory in the early 1870s and served as a scout from 1876 to 1878 at Fort Keogh. A frontiersman and explorer, he is credited for his accurate map of the Yellowstone River. In later years, Captain Kelly served with the military in Alaska and the Philippines and eventually retired to a fruit farm in California. "Yellowstone" Kelly died on December 17, 1928. Prior to his death, Kelly requested his remains be "tendered to the Authorities of the State of Montana, at Helena." While both Billings and Miles City campaigned for the honor, eventually the Montana Historical Society chose the rimrocks above Billings for Kelly's final resting place. Luther S. "Yellowstone" Kelly was buried atop Kelly Mountain on June 26, 1929.

Photo by Burley Packwood, Yellowstone Kellys Grave on Black Otter Trail NRHP 06001224 Montana.jpg - CC-SA 4.0

A year after Kelly's burial, I. D. O'Donnell, a prominent Billings businessman representing Suburban Homes Company, offered the City of Billings land on top of the rimrocks that included "Yellowstone" Kelly's gravesite. O'Donnell's offer stipulated that the city build and maintain a road to the Kelly monument. He thought a loop road would "enhance" the scenic attractions along the rimrocks.

Archaeological evidence indicates that early native peoples have visited this Yellowstone River region in the vicinity of Billings for over 10,000 years. Joseph Medicine Crow, the renowned Crow historian, believes the Crow were the first of the modern tribes to come to the rimrocks and regarded that place as a main part of the Crow Country. The Yellowstone Valley served as home to the Crow for many centuries, while numerous other tribes camped and hunted there. The Fort Laramie Treaty of 1851 gave much of the Yellowstone River Basin west of the Powder River to the Crow Tribe. The Fort Laramie Treaty of 1868 reduced Crow Reservation boundaries by removing all lands north (thereby including the rimrocks) and west of the Yellowstone River.

Plenty Coups, a Crow chief and visionary who lived from 1848 - 1932, allied the Crows with the white men, because he experienced a vision as a young man that non-Native people would ultimately take control of the Crow homelands of Montana.

One of his famous quotes is as follows: "Education is your greatest weapon. With education you are the white man's equal, without education you are his victim and so shall remain all of your lives. Study, learn, help one another always. Remember there is only poverty and misery in idleness and dreams - but in work there is self-respect and independence".

How true that statement is even today for many cultures throughout the world!

High places such as the rimrocks are important places for spiritual activities such as fasting, vision quests, and as burial places. The Crow warrior, Two Leggings, wrote that while fasting near the rims area he dreamed of seven men and one woman appearing "on the rimrocks north of the present town of Billings, singing 'Buffalo are coming toward me.'" Roger Turns Plenty understood that the Crow "used those high areas as fasting places ... to get spiritual help." Mary

Wallace and Nelson Wallace both mention that the Crow used the rimrocks as a burial place, where they made "Four Legs" (scaffolds) for burials.

A knoll near the **Black Otter Trail** is the burial ground for **Chief Black Otter**. According to L. M. Prill, in his Midland Review column "Driftwood," Chief Black Otter requested to be buried on this knoll so he could "look down the Yellowstone Valley and also look up the valley."

A knoll is a British name that refers to a small natural hill which is characterized by a round top in most regions. Another term for a knoll is hillock. The mounds are situated either individually or in clusters. Knolls are formed by the processes of weathering and/or erosion caused by variations in hardness of the types of rocks.

The part of the rocks more resistant to weathering and erosion is topographically higher than the surrounding, less resistant rocks. Weathering over the years causes the protruding harder rocks to wear to a rounded top. Resistant rocks include basalt, conglomerate, lava flows, limestone, quartzite, and sandstone. Glaciers also can form knolls when the glaciers polish down hard granite or gneiss rocks or when the glaciers melt and shift down a sloping ground. Over time the mounds are shaped by weathering agents to form knolls. Knolls can also form by the deposition of eroded material.

Interestingly, the existence of a Crow chief named Black Otter is questionable. Alice Ryniker remembers her father, county surveyor C. E. Durland, told her they just made up the name. The idea for the name is often attributed to Arthur Hart, an early Billings printer who lived among the Crow at one time. According to L. M. Prill, in his column "Driftwood," the name was to honor "one of the old-time Crow Indian chiefs whose name was Bah-poo-tay Spita-cot." Prill related a story told to him by Frank Shively, a mixed-blood, about the death and burial of Black Otter. Reportedly, Black Otter was mortally wounded on the Missouri River in a battle with the Sioux and requested that "his body be laid to rest in the center of Crow country - on the high point at the North end of the rims." None of the five Crow informants interviewed expressed any knowledge of a Chief Black Otter as a member of the Crow Tribe. Joseph Medicine Crow had asked Crow historian Plainfeather if he knew of Black Otter, and he said no, he thought the white men created this themselves. Elias Goes Ahead thought there might be some confusion between Black Otter and White or Little Otter. Regardless, the trail was named Black Otter Trail.

Another point of interest is **Skeleton Cliff**. This butte got its name from its use as a burial place by the Crow Indians. A visitor to the place about 1860 described the place thus: “From each tree there was the skeleton, perhaps a hundred all told. The bones dangling from the branches. . . Bright blankets had been used as shrouds swathing the bodies. The bodies were bound to the trees with tough rawhide thongs. On the ground beneath these there were scattered brass and copper rings, elk tooth necklaces, beaded moccasins, belts, etc., property of the dead."

A butte is an isolated hill with steep, often vertical sides and a small relatively flat top, created through the process of erosion by water, wind and ice. Buttes were once the part of elevated areas of land known as mesas or plateaus. Geographers say a butte is taller than it is wide, while a mesa is a much larger and less elevated rock structure. Debris that falls to the side of buttes is called scree or talus. Buttes usually form in arid regions, such as those in Mexico and the southwestern United States. Monument Valley, in the states of Utah and Arizona, has the most famous collection of buttes in the world.

Sacrifice Cliff, another historic location on the **Black Otter Trail** is known as the place where a large band of Crow Indians camped in the valley below prior to the late 1840s. An epidemic of smallpox broke out and nearly decimated the tribe. One legend stated that only two braves survived, the others fled or died. These two braves jumped to their death to join their friends and relatives in the Happy Hunting Grounds. Another version was that the Chief Medicine Man decreed that forty braves should offer themselves as a sacrifice to appease the anger of the Great Spirit, and adorned in ceremonial finery, they blindfolded their ponies and themselves and rode to their death from the top of the high bluff across the river. The Crow elders interviewed for the Historic Register remember the story of the village being decimated by smallpox, and either warriors or brothers who jumped to their deaths after their loss of family and

friends. Nelson Wallace noted that his uncle told him that two brothers rode double, with the older brother blindfolding both the horse and his younger brother, and he “whipped the horse and went over the rims”.

Both the Crow and the early settlers utilized the Yellowstone River Valley as a major transportation corridor. The **"Road to Tongue River"** followed the Yellowstone between Bozeman and Miles City. Alkali Creek flowed into the Yellowstone just east of the rimrocks and provided access to all points north. In Clark's Fork Bottom, the first town of Coulson was settled in 1877; however, this settlement was short-lived and surpassed by the establishment of the town of Billings in 1882.

The new town of **Billings** was situated directly on the route of the Northern Pacific railroad, which arrived in Billings in 1883. Billings gradually grew into the major socio-economic trade center for the region and its transportation hub.

Throughout the history of Billings, organizations like the commercial club (predecessor to the Chamber of Commerce), led by prominent businessmen, strove to promote the business interests and welfare of their community. In 1910, the Commercial Club supported construction of the **Heffner Steps**, 27 steps cut by Heffner Quarry workers up the face of the rimrocks, for the benefit of sightseers.

In 1938 a poem by Jack Horan entitled **"Black Otter Trail"** was hung in the building of the Billings Commercial Club:

Black Otter Trail by Jack Horan, 1938
The name Black Otter takes us back to a day many moons ago
The redman on his hunting ground
In the land of the buffalo.
Just memories of a day gone by,
Beneath Montana skies so blue
In the land of the shining mountains
Where today we welcome you.

Denver Gem & Mineral Show Mini Report April 2023

Planning for the 2023 Denver Gem & Mineral Show is well underway. The show will again be held at the Colorado Convention Center in conjunction with the Hard Rock Summit. The dates are Friday, September 15th to Monday, September 18th. Having the show from Friday to Monday has never been done before, but this year it is unavoidable due to an unfortunate scheduling conflict at the Colorado Convention Center. The theme for the 2023 show is Gem Minerals: Nature's Bling. This is a wide-open theme with almost unlimited possibilities. This is a chance for you creative people to strut your stuff! So, get those creative juices flowing! **Of course, all exhibits are welcome at the show. An exhibit is not required to adhere to the show theme**.

The following is a synopsis of ideas on the theme written by Mark Jacobson.

> Gem Minerals: This includes the principal (6 species) and important gemstones (greater than 13 mineral species), quartz family, rare and unusual, massive and decorative, and lastly the organic gemstones. John Sinkankas in his 1959 *Gemstones of North America* book lists all these types as did George Frederick Kunz in his 1892 *Gems and Precious Stones of North America*.
>
> For displays, ideas include rough and cut gemstones or just crystallized gemstone minerals. In Colorado alone you can have peridot (olivine) from Badger Creek; aquamarine from Mt. Antero, amazonite from Crystal Peak, diamonds from Larimer County, smoky quartz from Crystal Park, topaz from the Tarryall Mountains, yellow apatite from Eagle County, amethyst from Unaweep Canyon, and rhodochrosite from the San Juan Mountains.

A massive and decorative gemstone display could have graphic granite, amazonite, variscite from Utah, turquoise from Arizona and Nevada, moonstone from Virginia or Texas, orthoclase moonstone from Rabb Canyon, New Mexico, massive blue quartz from Virginia to Georgia, turquoise from San Luis Valley, fine-grained massive lepidolite from the Brown Derby, lapis lazuli from Italian Mountain, and malachite and azurite from the western United States.

The organic gemstones include coral, shell such as New Zealand abalone (aka pua), amber, jet, mammoth ivory tusks (used for carving), and pearls.

Fossil gemstones include turritella agate, iridescent ammonites (ammolite), opalized dinosaur bones and shells, opalized petrified wood, and possibly pyritized snails.

Educational exhibits can include formation of particular gemstones with examples of their environment, how to facet/polish a gemstone, or finished examples of gemstones in use – decorative Russian inlaid boxes, jewelry, jade handles of ritual knives, pre-Columbian jade artifacts, or even a genuine "stone of the Amazons" which is jadeite.

So, you see there is a huge variety of possible interpretations of the theme. If you wish to enter an exhibit in the show, please contact Exhibit Chair Larry Havens at lwrnchavens@comcast.net or 720-401-6543. He will be glad to hear from you.

The 2023 show will feature the same competitions as last year, namely, the species categories, the Prospector and Junior Prospector, and the Best of Show.

Stay tuned for more information about the show later.

Respectfully submitted,
Judy Knoshaug, Show Secretary

AFMS Endowment Fund

Richard Jaeger

I am the Rocky Mountain Federation Regional Chairman for the AFMS Endowment Fund. Cheryl Neary, a member of the Eastern Federation, is the AFMS Endowment Fund Chair and the AFMS Central Office Administrator.

Basically, this is a raffle drawing with tickets being sold at $5 each or five tickets for $20. The drawing will be held at the NFMS/AFMS Convention in Billings, Montana in August (see page 18). People from around the American Federation donate prizes for the raffle, which may be jewelry, crystals, minerals, fossils, books, or other items, each valued from $75 to $200. The drawing is handled so there is at least one winner from each of the seven regional federations; last year we had five winners from the Rocky Mountain Federation. We usually have about three or four winners from the RMFMS.

As items are donated, pictures of them will appear in the AFMS Newsletter and on the American Federation website, www.amfed.org. There are usually around 30 items.

This is a major way to financially support the American Federation's efforts on behalf of our hobby. Currently the funds go towards the Junior Rockhound program, judges training, and preparing programs for distribution to regional federations (programs that can be used by individual clubs). Over $5,000 was raised last year.

Purchasing the tickets: Cheryl requests that your checks for tickets be sent to the regional chairs (for RMFMS, send to Richard Jaeger, 3515 E. 88th St., Tulsa, OK 74137) so we can issue tickets and have a record of who has entered. **Checks should be made payable to the "AFMS Endowment Fund."**

We then forward those checks to Pat LaRue, the AFMS Treasurer. I will fill out the proper number of tickets for each contribution, send the stubs to the donating individual, and get the tickets to the NFMS/AFMS Show in Billings in August to be put into the RMFMS bag. There will be at least one general prize ticket, maybe two or three, drawn from each of the bags for the seven regional federations. After that, all tickets will be dumped into one bag, and further drawings will take place until all the prizes have been awarded.

I hope that many of you will participate and hopefully be winners in Billings. **You need not be present to win.** I would also be happy to accept any donated prizes for the raffle or they can be sent directly to Cheryl Neary; the more prizes, the more winners, and hopefully, more money raised. Cheryl's address is: 42 Jefferson Ave., Patchogue, NY 11772. My wife and I are each donating a piece of jewelry for Endowment Fund prizes. My contact information is provided below. Please share this information with your club members and thanks for your consideration.

Please purchase some tickets – and hopefully get your ticket drawn in Billings in August.

Richard D. Jaeger
918-481-0249
RjgrSci@aol.com

Other Rockhounding Events and Activities in the Area

If you plan to attend any of these that have not been canceled, please check their websites for the latest updates before you go.

- **Friday, May 12**, 7:00 pm is the **Denver Gem and Mineral Guild**'s monthly meeting featuring **Gary Curtis** with a program on **Colorado Meteorites**. All are welcome.

- **Saturdays, May 13** and **June 3**, **Summer Family Days** at the **Western Museum of Mining & Industry Museum**, featuring. Outdoor machine demonstrations, blacksmith demo, gold panning, tractor-pulled hayride, and more! 225 North Gate Blvd. in Colorado Springs. Enjoy all the outdoor activities for only $5 per car. Regular admission applies for indoor activities. https://fareharbor.com/embeds/book/wmmi/items/118727/calendar/2023/05/?flow=no&full-items=yes

- **Friday, May 19**, 2:00-3:00 pm, Denver Museum of Nature & Science Earth Science Colloquium, **Geology of Grand Mesa, Colorado**, by Rex Cole, Colorado Mesa University. In the VIP Room. All are invited and Museum admission not required; check in at the Security Post.

- **Saturday, May 20**, 12 noon-4 pm, **Friends of Mineralogy Silent Auction** at Wheat Ridge United Methodist Church, 7530 W. 38th Ave. All are welcome to attend, bid, and/or bring specimens to sell (minimum 20% donation to FM). See https://friendsofmineralogycolorado.org/ .

- **Friday through Sunday, June 9-11, Pikes Peak Gem, Mineral, and Jewelry Show**, sponsored by Colorado Springs Mineralogical Society at Norris Penrose Event Center, 1045 Lower Gold Camp Road, Colorado Springs. Friday noon-7 pm, Saturday 10-5, and Sunday 10-4. Admission $5 per day, $8 for multiple days, 12 and under free.

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trickrun@gmail.com

Facebook Chair
Gerry Naugle, 303-591-2830
gnaugle@earthlink.net

Meeting Door Prize Chair
Brad Willkomm, 303 249-8877
bpwillkomm@yahoo.com

Grab Bags
Anita Colin, 720-556-9889
anitacolin@hotmail.com
Charlotte Bourg, 970-278-0975
rckhnd4252@gmail.com

Mineral Specimens for Grab Bags
Don Mock
donmock@hotmail.com

Club Show Committee Members
Show Chair
Brian Walko, 303-931-4283
earthextractions@gmail.com
Show Volunteer Chair
Charlotte Bourg, 970-278-0975
rckhnd4252@gmail.com
Show Dealer Chair
Andrew MacGregor, 720-988-3259
andrew.d.macgregor@gmail.com
Show Advertising and Admissions
Gerry Naugle, 303-591-2830
gnaugle@earthlink.net
Show Kid's Corner Chair
Charlotte Bourg, 970-278-0975
rckhnd4252@gmail.com

Denver Show Club Table
open

A friendly reminder to pay your 2023 annual dues

Dues are still only $18 per individual and their immediate family. You can pay in two ways:

PAY Gerry Naugle, Treasurer and Membership Chair, at any FMC monthly meeting. Gerry is at or near the sign-in table when you enter the room for the monthly meetings.

SEND a check made to "Flatirons Mineral Club" or "FMC" to P.O. Box 3331, Boulder, CO, 80307. Please do not send cash in the mail.

Your 2023 dues must be received by January 20th, 2023 in order to stay current with the member benefits, which include electronic club newsletters containing the information about club activities, club field trips, annual show opportunities, silent auction opportunities, the annual club summer picnic, and access to the club website. Your receipt is your new annual 2023 FMC membership card.

Flatirons Facets
P.O. Box 3331
Boulder, CO 80307-3331

First Class Mail

Upcoming Events

Date	Event	Location
Tuesday, May 9 at 7:00 pm.	Club meeting with Gerry Naugle talking about the Bone Wars and Will Rehn introducing the 2023 field trips. See page 3	Mountain View United Methodist Church, 355 Ponca Place in Boulder
Wednesday, May 17 at 6:30 pm	Jr. Geologists featuring Volcano Night. See page 11	Mountain View United Methodist Church, 355 Ponca Place in Boulder
Saturday, May 20	Field trip to the CU Map Repository. See page 4	CU Boulder campus
Saturday, June 10	Field trip to the Phoenix Gold Mine and Argo Mill and Tunnel. See page 4	Idaho Springs, Colorado
Tuesday, June 13 at 7:00 pm	Specimen bagging party for grab bags. See page 8	Mountain View United Methodist Church, 355 Ponca Place in Boulder
Sunday, June 25	Field trip to Hartsel to collect blue barite	Hartsel, Colorado

Flatirons Mineral Club
P.O. Box 3331
Boulder, CO 80307

2023 Ballot for FMC / RMFMS / AFMS 'Rockhound of the Year'

The club membership each year honors an active member, or a husband and wife team who have made substantial accomplishment during the past year in promoting and furthering the FMC goals, as per the club's "Mission Statement" which is outlined in the Club By-laws.

Since inception of the new version of this program in 2002, the annual FMC recipients have been: Charlotte Morrison (2002), Paul & Martha Ralston (2003), Ray & Dorothy Horton (2004), John & Jeanne Hurst (2005), Ray & Joyce Gilbert (2006), Chuck & Jan Buda (2007), Cory Olin co-tie with Hallie & Dot Cook (2008), Shaula Lee (2009), Anita Colin co-tie with Gabi Accatino (2010), Mel & Charlotte Bourg (2011), Deborah Knox (2012), Ed Raines & Silvia Pettem (2013), Mike Smith (2014), Tally O'Donnell (2015), Dennis Gertenbach (2016), Trick Runions (2017), Jean Orr (2018), Craig Hazelton (2019), Brian Walko in 2020, Susan Peach in 2021 and Will Rehm in 2022.

Please list your 2023 nominee below. You can also vote by several electronic means. All voting information is confidential and will be tallied and is then erased /or/ shredded by Gerry Naugle. The FMC annual winners' names are sent to the RMFMS and AFMS offices for publication in their respective newsletters. Note: The annual FMC winner(s) are also inducted into, and their names are engraved onto the *'FMC Hall of Fame (HOF) Plaque.*

Your 2023 nomination is: _____

The person (or) persons should be honored because of (brief summary):

_____

_____

_____

Submitted by, please print _____

Please return this paper ballot to Gerry Naugle (use the above letterhead address) by July 15th **Or** (the easiest means possible) by sending an e-mail to: gnaugle@earthlink.net

Voting results will be announced and the HOF Plaque at the 2023 annual club picnic at the **Pavilion at Harlow Platts Park,** 1496 Gillespie Drive in 80305, on Sat, Aug 19th. More info on that picnic in the club newsletter, and the picnic starts at 11:00am on that day.

Thanks for participating !

FMC23 Field Trip Schedule

Flatirons Mineral Club (FMC), Boulder, Colorado **R6**

FMC's 2023 field trip season features a variety of trips, with a focus on collecting, education, and exploration..

Unscheduled trips will also come up as opportunities present themselves. Please watch your inbox for announcements about all of the trips as the 2023 season unfolds.

Please Note: This list will definitely change. Please be sure to refer to the "Field Trip" section of the FMC website for the most current and accurate information, and to sign up for all trips.

FMC 2023 Field Trip Catalog

DATE	TRIP	Objective	Distance	NOTES	Trip Leader
APRIL	1. Edgar Experimental Mine - Colorado School of Mines	Hardrock edu and tour	39 mi Idaho Springs, CO	**28 April FRIDAY**	Brian Walko
MAY	2. CU Map Library & USGS Repository	An FMC & CMS joint meetup: mine maps, USGS maps,aerials, historic maps	0 mii CU Campus Boulder, CO	**20 May Saturday**	Will Rehm
JUNE	3. FMC23 Double Header: A.Phoenix Mine & B. Argo Mill	A, Hardrock mine and B. Mill edu, with gold panning	40 mi Idaho Springs. CO	**10 June Saturday**	To Be Announced
	4. Hartsel	Barite Collecting	115 mi Hartsel, CO	**25 June Sunday**	Anita Colin

JULY	5. Florissant Fossil Quarry	Fossils	130 mi Florissant, CO	**15 July Saturday**	To Be Announced
	6. NCAR Boulder (AKA Roberts Mesa) *For members AND prospects*	The geology of NCAR, a walking geo edu tour	0 mi NCAR, Boulder, CO FMC members AND Public	**29 July Saturday**	Will Rehm
AUGUST	7. Calumet Iron Mine	Epidote, Quartz, Magnetite	163 MI North of Salida, CO	**August 19 -20** *Weekend*	To Be Announced
SEPTEMBER	8. North Table Mountain	Zeolites A joint FMC/CMS trip	20 MI Golden, CO	**To Be Announced**	Dennis Gertenbach
OCTOBER	9. Crawford Sept 30-Oct 1	Joint CMS & LGMC Trip Agate, Opal, Chalcedony	273 Mi Crawford, NE	**Sept 30-Oct 1** *Weekend*	Brian Walko
	10. Dinosaur Ridge Outdoor Museum	Bone Wars & .edu meetup	30 mi Lakewood, CO	**Oct 7** *With weather backup date*	Gerry Naugle