



## Colorado Springs Mineralogical Society

Founded 1936

~ Lazard Cahn ~  
Honorary President

"Pick & Pack"  
Volume 64 No. 9  
November 2024



## CSMS General Assembly

Thursday, Nov 21, 2024 7:00 PM  
Colorado Springs Christian School  
4855 Mallow Road

### DOUBLE FEATURE

## ~ Veatch and Blizzard ~

"Sediment Showdown: An Alluvial Fan Takes on A Debris Flow"  
&

"Framing the Past: Capturing Cripple Creek Mining District's  
History Through the Lens"

### SNACKS: Bring em if you got em

Society members are always encouraged to bring specimens to  
general assembly to share and/ or for help with identification

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## Sediment Showdown: An Alluvial Fan Takes on A Debris Flows

Steven Wade Veatch ~ Sawyer Blizzard



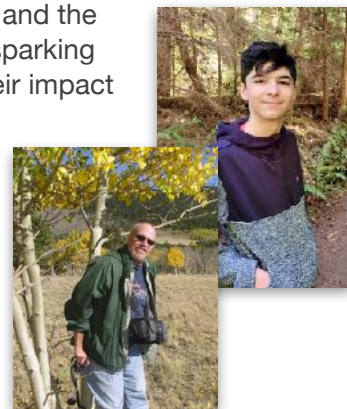
Join us for an engaging program where CSMS members Sawyer Blizzard and Steven Veatch will dive into the fascinating world of alluvial fans and debris flows! These powerful natural processes shape landscapes and ecosystems, carrying sediment, rocks, and organic material down mountainsides to create dramatic fan-shaped formations. During this session, Blizzard and Veatch explore what is an alluvial fan. Learn how water flow and sediment movement create these dynamic landforms over time.

Then discover debris flow mechanics and the role of intense rainfall and erosion in sparking rapid debris flows and understand their impact on natural and built environments.

See real case studies of alluvial fans and debris flows and their importance

in natural landscapes and human development.

Whether you're a geology enthusiast or just curious about the forces that shape our planet, this program is designed to inspire awe and respect for Earth's powerful geological processes. Don't miss it!



COLORADO SPRINGS MINERALOGICAL SOCIETY PO BOX 2 COLORADO SPRINGS, COLORADO 80901-0002  
Visit our website: <http://www.csms1936.com/>

## Framing the Past: Capturing Cripple Creek Mining District's History Through the Lens

Steven Wade Veatch

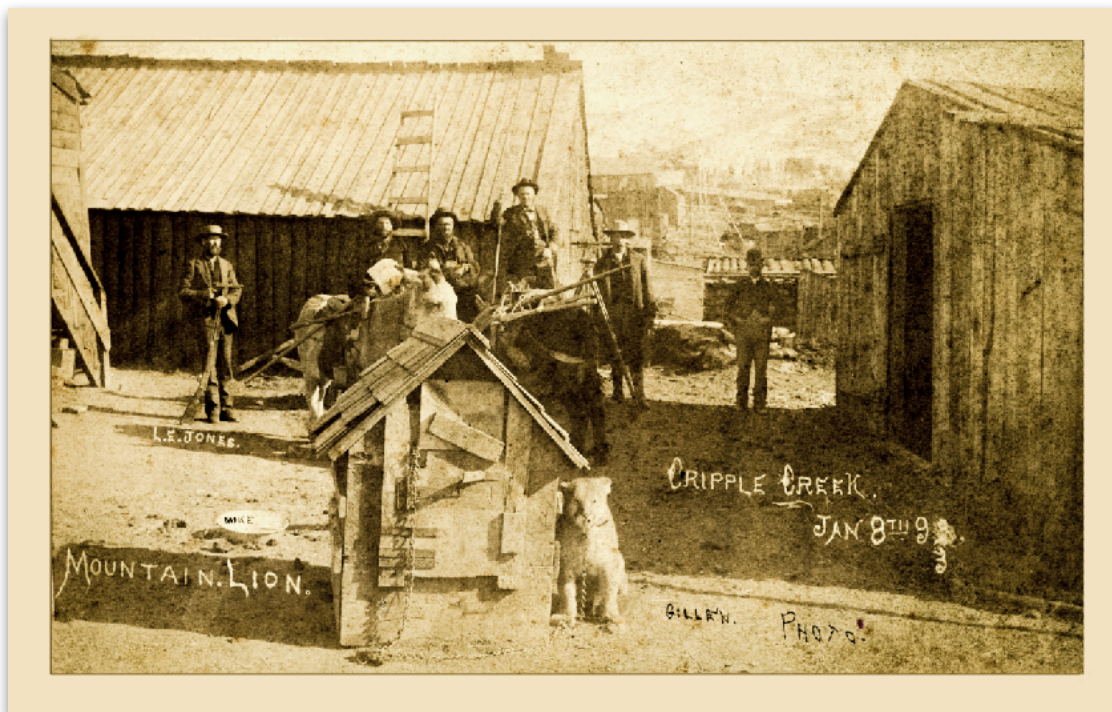
The Cripple Creek Mining District, in Colorado, was a significant gold mining area during the late 19th and early 20th centuries. Gold mining continues there today. Several photographers documented life in the district during this time. Three photographers made important and valuable visual records of mining operations, daily life, and landscapes of the region during the late 1890s and early 1900s.

**William J. Gillen** (birth date and death date unknown) was an American photographer known for his work in the early days of the Cripple Creek Mining District. His photographs offer a glimpse into the daily lives of the people who inhabited the mining district. His work includes portraits, street scenes, and events, providing a broader perspective on the area beyond mining activities.

**Edgar A. Yelton** (1866-1946) was a photographer whose notable works captured the mining activities, social scenes, and landscapes of the Cripple Creek mining district. His work provides a visual narrative of the challenges and triumphs of the mining district.

**Julia Skolas** (1863-1934) was a pioneering woman photographer and postcard publisher known for her work in the early 20th century. She operated a studio in Colorado Springs and then in Cripple Creek during the mining boom. Her collections included images of miners at work, mining equipment, and the rugged terrain of the area. Her work also contributes to a more comprehensive understanding of the human experience in the mining district.

These three photographers played a crucial role in documenting the history and culture of the Cripple Creek Mining District, leaving behind a visual legacy that helps us understand the challenges and triumphs of this important period in Colorado's history. Join Steven Veatch for a program that explores their rich legacy of photographs of the gold camp.



**Steven Veatch** is a life member of the CSMS and is a 2015 inductee of the National Rockhound Hall of Fame. Veatch writes about Cripple Creek's mining history and its geology.

**Sawyer Blizzard** is a senior in high school and a junior member of the CSMS. He meets with Steven Veatch each Monday via zoom to study geology and paleontology. Together they have completed a number of projects. Sawyer's research articles have appeared in the club's newsletter and in the *Ute Country News*. Sawyer is an avid fossil collector.

## CSMS Group Calendar

Oct '24    Nov '24

13 Nov	11 Dec	Fossil Group	2nd Wed	6:00 PM	East Library	Kristine Harris Richard Villareal	719-593-1524 831-760-6985
7 Nov	5 Dec	Board Meeting	1st Thur	6:00 PM	Zoom	Alex Field	719-351-4897
5 Nov	3 Dec	Pebble Pups	1st Tue	4:15 PM	East Library	David St. John	719-424-9852
21 Nov	19 Dec	General Assy	3rd Thur	7:00 PM	Co Sp Christian Sch	Alex Field	719-351-4897
28 Nov	26 Dec	Crystal Group	4th Thur	7:00 PM	Co Sp Christian Sch	Kevin Witte	719-638-7919
By appt	By appt	Faceting Group	By appt	By appt		John Massie	719-338-4276
By appt	By appt	Lapidary Group	By appt	By appt	Sharon's Garage	Sharon Holte	719-217-5683

## Community Events (Pete Modreski)

**Nov 15-17:** (anticipated date), Denver Area Mineral Dealers (D.A.M.D.) Gem and Mineral Show, at the Jefferson County Fairgrounds, Golden.

**Nov 22-24:** Jeffco Mineral Show (formerly called the Denver Area Mineral Dealers Show), at the Jefferson County Fairgrounds, Exhibit Building, Golden.

**Dec. 13-15:** Flatirons Gem and Mineral Show, at the Boulder County Fairgrounds, Longmont; sponsored by the Flatirons Gem & Mineral Club [Boulder].

**Oct 24:** Denver Museum of Nature & Science, Earth Science Colloquium series: *Brain evolution and the origin of birds*. (Amy Balanoff, Johns Hopkins)

**Nov 14:** Denver Museum of Nature & Science, Earth Science Colloquium series: Did the Deccan Traps volcanic province cause the end-Cretaceous mass extinction? (Blair Schoene, Princeton)

**Dec 5:** Denver Museum of Nature & Science, Earth Science Colloquium series: The wandering Falklands: A plate tectonic odyssey. (Eric Roberts, Mines) <https://sites.google.com/view/dmns-earth-science-colloquium/home>





# Federation News Post

American Federation of Mineralogical Societies  
Rocky Mountain Federation of Mineralogical Societies



**Above L-R:** Bob Regner (left) installed these officers and state directors during the RMFMS Awards Banquet: Leane Gray/ WY State Director, Jim Gray/President, Donna Regner/NM/TX State Director, Gene Maggard/Treasurer, Jodi Brewster/AZ/ NV State Director, Larry Beck/KS State Director. **Photos below:** officers and state directors also in attendance.



Tracy Jensen  
UT State Director



Cinda Kunkler  
Historian



Liz Thomas  
Secretary



Lori Loomis  
SD/NE State  
Director



Roberta Waggle  
OK/AR State  
Director



**Left:** Among the banquet favors were wire-wrapped "Oklahoma tornadoes" on selenite. There were also some very large barite roses! Lots of thanks and appreciation to Jami Poor and the OGMS folks for providing a wonderful 2024 show for the RMFMS!

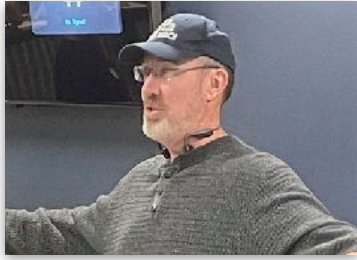
**About the AFMS** - A non-profit educational federation of seven similar regional organizations of gem, mineral and lapidary societies. The purpose of AFMS is to promote popular interest and education in the various Earth Sciences, and in particular the subjects of Geology, Mineralogy, Paleontology, Lapidary and other related subjects, and to sponsor and provide means of coordinating the work and efforts of all persons and groups interested therein; to sponsor and encourage the formation and international development of Societies and Regional Federations and by and through such means to strive toward greater international good will and fellowship. Founded in 1947.

**About the RMFMS** - A non-profit educational organization. The purpose of the Rocky Mountain Federation is to have a close association of all clubs in the Society to promote the study of earth sciences, including the lapidary arts, the study of fossils and paleontology, and related crafts. The RMFMS was organized in 1941, and held its first annual convention at the Argonaut Hotel in Denver, Colorado. There were 16 organizations in attendance. The RMFMS became one of the original four founders of the American Federation of Mineralogical Societies when it was organized in 1947.



## Secretary's Spot

John McGrath



### 2024 CSMS Officers

**Alex Field**, President  
**Shane Riddle**, Vice-President  
**John McGrath**, Secretary  
**Ann Proctor**, Treasurer  
**Adelaide Bahr**, Membership Secretary  
**John Emery**, Editor  
**Chris Burris**, Member-at-Large  
**William Meyers**, Member-at-Large  
**John Massie**, Past President

### 2024 CSMS Chairpersons

**Shane Riddle**, Program Coordinator  
**John Massie**, Show Vol Coordinator  
**Kyle Atkinson**, Field Trip Coordinator  
**Vacant**, Science Fair Chair  
**Frank and Ellie Rosenberg**, Librarians  
**Tina Cox**, Social Committee Chair  
**Ann Proctor**, Store Keeper  
**Lisa Cooper**, Show Chairman  
**Lisa Cooper**, Webmaster  
**Shane Riddle**, Facebook Keeper  
**Mike Nelson**, Federation Rep  
**Vacant**, Federation Rep

## CSMS General Assembly Minutes

7 PM, Thursday Oct 17 Colorado Springs Christian School

**Address:** 4855 Mallow Rd, Colorado Springs CO 80907

**Board Attendance:** President: Alex Field, Vice President: Shane Riddle, Past President: John Massie, Treasurer: Ann Proctor, Secretary: John McGrath, Editor: John Emery, Member-at-large: Chris Burris.

### Agenda:

- I. Meeting was called to order by our President, Alex Field at 7:07 PM
- II. The Pledge of Allegiance was led by Alex.
- III. There were 5 New Members and 0 Guests in Attendance.
- IV. Program Speaker - Dave Elhert spoke on his entry into Paleontology and the Laramie Formation. He first discovered the fossil site in Colorado Springs on Centennial Blvd, just north of the intersection with Rockrimmon Road.
- V. Meeting - 48 members/guests in attendance and 5 minerals were given.
- VI. Mark Mann displayed the new club logo with hat and shirt examples.
- VII. Officer Reports
  - A. President - Alex Fields - asked for volunteers for the Hospitality Committee coordinator. He also requested a Volunteer coordinator for the Gem and Mineral Show. John Massie who has been the Volunteer coordinator for the last few Shows will train up the new Volunteer coordinator for the upcoming Show.
  - B. Vice President - Shane Riddle - No report.
  - C. Treasurer- Ann Proctor. No report
  - D. Secretary- John McGrath. He asked if anyone was having problems receiving the Pick and Pack or Club emails and if so to email him at john.mcgrath115@gmail.com. He reminded everyone of the upcoming Rockhounding 101 Trip to Fern Creek.
  - E. Membership Secretary - Adelaide Bahr, Absent
  - F. Editor - John Emery. He described the Rockhound of the Year Nomination process with nominations made during the November General Meeting and Voting occurring at the December meeting. He also said that the P&P is going well and thanked everyone for the pictures and write ups.
  - G. Members at Large
    1. Bill Myers - Absent.
    2. Chris Burris - Present. No report
  - H. Past President - John Massie. No report.
- I. Website and Show Coordinator - Lisa Cooper, Absent
- VIII. Satellite Groups
  - A. Crystal Group - Kevin Witte and Austin Cockrell announced that the group would be holding a Halloween Party and Crystal talk at the next meeting. The meetings are held the 4th Thursdays of each month at CSCS
  - B. Faceting Group - John Massie. He has a sign up for training on the machine.
  - C. Pebble Group -David St John said that he had good participation at both the Group meeting where they learned about 3D printing for fossils. Fossil Day was also a success. It was located at a Widefield school. He has a large amount of unlabeled minerals and would like help this Winter to identify and label them.
  - D. Fossil Group -Kristine Harris and Richard Villareal stated that meetings are held the 2nd Wednesday of the month from 6-7:30 at the East Library Annex.
  - E. Jewelry Group, no report.
  - F. Lapidary Group - The clean up at Sharon's house was successful, but may need another day.
- I. Liaisons
  - A. Claims and Librarian -.Frank and Mike. No news
  - B. Field Trip Coordinator - Kyle Atkinson. Absent on Honeymoon.
  - C. Social Coordinator - Tina Cox. Looking for a member to take over her duties.
  - D. Store Keeper - Ann Proctor. No report
  - E. Creative Director - Mark Mann - He's adding a banner to the Website and is open to feedback on the site.
- II. Unfinished Business - None discussed.
- III. New Business - None discussed
- IV. Meeting adjourned by Alex at 20:54 pm

### Respectfully Submitted

John M McGrath MD COL (RET) USA  
Secretary



Alex Field  
President

## President's Corner

Alex Field  
CSMS President



### 2024 Satellite Group Chairs

**Austin Cockell/Kevin Witte**, Crystals  
**John Massie**, Faceting  
**K. Harris/ R. Villareal**, Fossils  
**Vacant**, Jewelry  
**Sharon Holte**, Lapidary  
**Vacant**, Micro-mount  
**Vacant**, Photography  
**David St. John** Pebble Pups

### 2024 Liaisons

**Florissant Fossil Beds National Monument:**  
S.W. Veatch  
**Western Museum of Mining and History:**  
S.W. Veatch

### Non-officer Positions

**Mark Mann**, Creative Director



## Presidential Matters



Happy November Rockhounds!

Well, Colorado Winter is setting in (clearly!) and the field trip and digging season has slowed down as a result. However, join us at our general assembly meeting on November 21st and gather with your fellow rockhounds - some of us will still find ways to get out and hunt for minerals (and perhaps you can join them!).

Also, at our November general assembly meeting, we will be holding our annual board election, and we need your help. We will be actively voting on several positions this year, so please come out and vote for the board members for 2025. We'll also be voting for Rockhound of the Year.

In addition, we recently picked up a donation of mineral and geology related books and magazines, so we'll have a couple boxes available for members to take home if they're interested.

Finally, our society thrives when more volunteers get involved in the society, so if you want to help out in some way, please let me know!

See you all November 21st!

Warm Regards,  
Alex

Alexander Field  
alexfield1@gmail.com





Pebble Pups  
David St. John

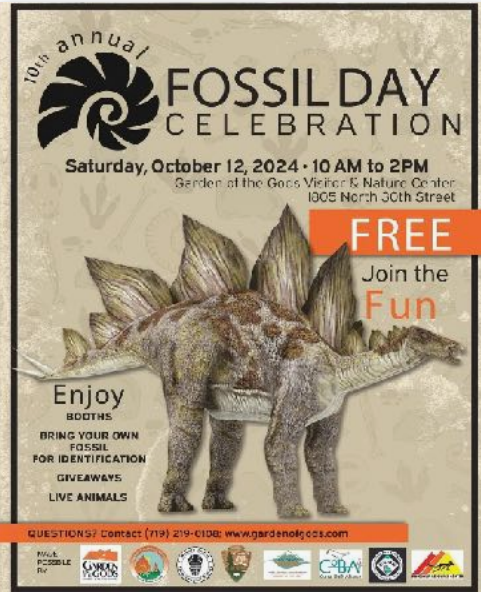
## CSMS Pebble Pups and Earth Science Scholars



Fossilfun14@gmail.com

### Fossil Day at Garden of the Gods Visitors Center 2024

We had an amazing day Oct 12th with over 6,000 visitors coming through the door at GoG Visitor Center. Huge shout out to Sawyer Blizzard, our very busy Earth Science Scholar and Kathy McCarthy for helping the setup, tear down, and helping with the booth giveaways and sharing with the guests. I posted the poster to show the amazing partners we shared the special day with. The club support and donations allowed over 600 fossils, toy skeleton dinos, and stickers to future rock hounds. Our club was well represented and received so many positive comments during the event.



Pebble pup meeting Nov 5 at the East Library 4:15-5:15 surprise lesson. Dec 3 is our winter party, bring treats, one small present to do white elephant exchange per pup, share and tell session, with a few Earth Science Games. Hope to see ya both times. U Rock!

- David

~ email me at [fossilfun14@gmail.com](mailto:fossilfun14@gmail.com) ~



wonderwoman627 at Pixabay

November 2024

Visit the CSMS Pebble Pup website: <http://pebblepups.blogspot.com/>



wonderwoman627 at Pixabay

CSMS Pick & Pack

7

# Azurite, Pseudomorphs, and October Supermoons

Mike Nelson  
csrockguy@yahoo.com

This last month has been an exciting time for ole dedicated moon watchers like me. The home we purchased here in the Village of Holmen has tall red pines and a deciduous understory as the eastern property border. The western part of the neighborhood also has trees that block a view of the horizon. However, in the “middle” there is a huge expanse of “sky” that is visible. In the mornings I plop my rear on a deck chair, sip my hot, bold, black Kona coffee and watch the sun filter through the pines at sunrise. The birds seem happy, although not noisy as in the spring, but certainly visit the large feeder. In the evenings I switch sitting areas and hit the rocking chair facing west with a cold IPA at sunset. A nice relaxing beginning and end of the daylight. BTW, daylight seems to be rapidly disappearing (now 10 hrs 57 min — 11 minutes shorter than Colorado Springs) as we slide toward the Winter Solstice.

Observing the night sky is the time to contemplate and celebrate being alive. We have little light pollution here and the noise pollution is very low except for occasional Friday night football games. Last September 17<sup>th</sup> I enjoyed the night of the Harvest Full Moon, a Supermoon. To add visual joy to the experience, there was a partial lunar eclipse starting at about 7:40 pm CDT and peaking two hours later. Only about 8-10 percent of the upper moon was covered at the peak eclipse but still, that was impressive. The Harvest Full Moon received its name from the fact that before massive mechanization farmers could stay in the fields long after

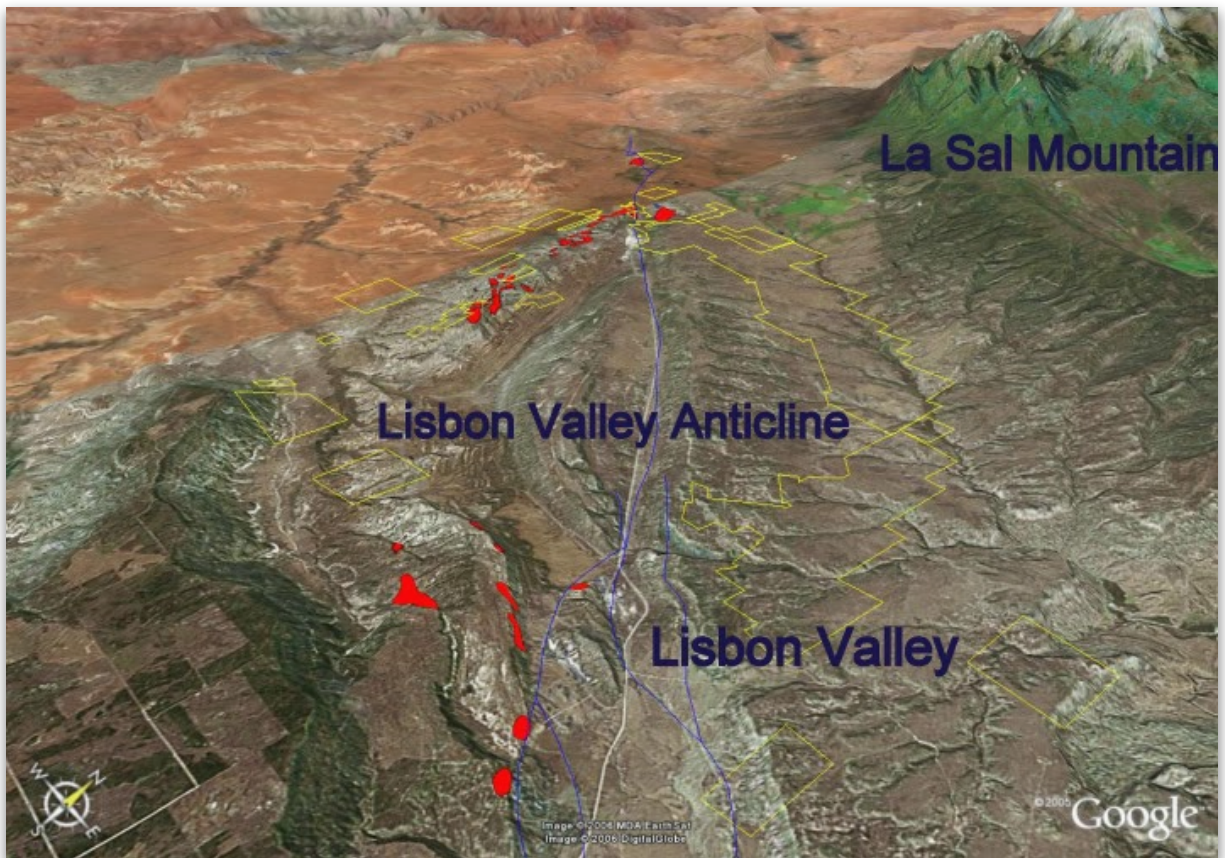
dark. I certainly remember working late in the evenings picking corn in the moonlight for my Uncle farmer. It was money for a poor kid but I must confess I always was on the lookout for wolves and other giant critters!

Tomorrow, on October 17th 2024, the largest Supermoon of the year pops up and is known as the Hunter Moon. It seems to reference the beginning of the hunting season in olden times when wild game played a major part in the food chain of rural folks. Of course, the last couple of nights the moon has appeared almost full, and I have enjoyed watching it move over the trees into my open sky. Several recent nights brought honking geese moving south to better feeding grounds, perhaps due to a little cold snap of 27 F last night. It seems I don't need much to give me satisfaction; so, the moon cycles and the colorful turning trees make for a “good time” that I intersperse with observations of my minerals.

Recently something spurred me to reach into my magic drawer and pull out a small, unmounted specimen received several years ago but never really examined closely—brochantite from the Blue Crystal Mine in San Juan County, Utah.

The Blue Crystal is located near Moab, Utah, south of the nearby La Sal Mountains in Lisbon Valley. The Valley is home to one of the better-known local uplifts, the Lisbon Valley Anticline, a large salt anticline where the dipping beds are due to movement/solution of salt in the subsurface. Several of these salt structures are found in the greater Paradox Basin, an evaporate basin in Utah and Colorado near the Four Corners. Although the Valley has several tens of producing gas wells, the most active mineral commodity has been the numerous uranium mines (mostly closed in the 1980s) and the





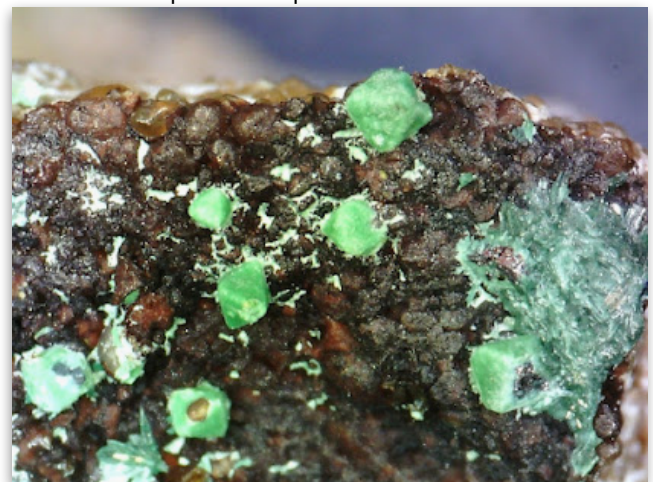
**Above:** Satellite image, oblique view, of Lisbon Valley looking northwest down the strike of the Lisbon Valley Anticline. *Photo courtesy of Mesa Uranium Corporation.*

area today is dreaming about a uranium resurgence. Target zones have been, and still are, the Cutler Formation/Group (Permian), the Moss Back Member of the Chinle Formation (Triassic), and the Salt Wash Member of the Morrison Formation (Jurassic) found along the flanks of the anticline.

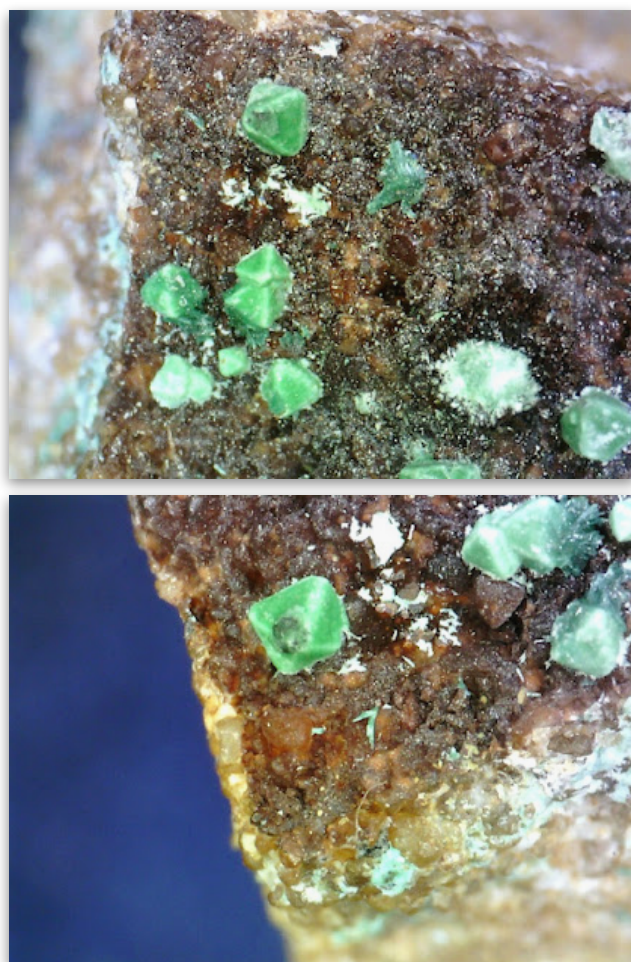
Copper is also present in varying quantities and qualities in Lisbon Valley and has been periodically mined for decades. Most of the paying copper deposits seem to be in the Dakota Sandstone and Burro Canyon Formation, both Cretaceous in age — therefore younger and above the uranium beds. The major copper ore is chalcocite ( $\text{Cu}_2\text{S}$ ) deposited by solutions brought up along the Lisbon Valley Fault (found along the crest of the anticline with offset approaching 4000 feet). With time, chalcocite oxidizes to

such secondary minerals as azurite [ $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$ ] and malachite [ $\text{Cu}_2(\text{CO}_3)(\text{OH})_2$ ], both copper carbonates, (but note that azurite commonly pseudomorphs to malachite), and tenorite [ $\text{CuO}$ ] and cuprite [ $\text{Cu}_2\text{O}$ ], both copper oxides.

**Below:** Three photomicrographs detailing submillimeter size malachite pseudomorphs. *Photos: M. Nelson*

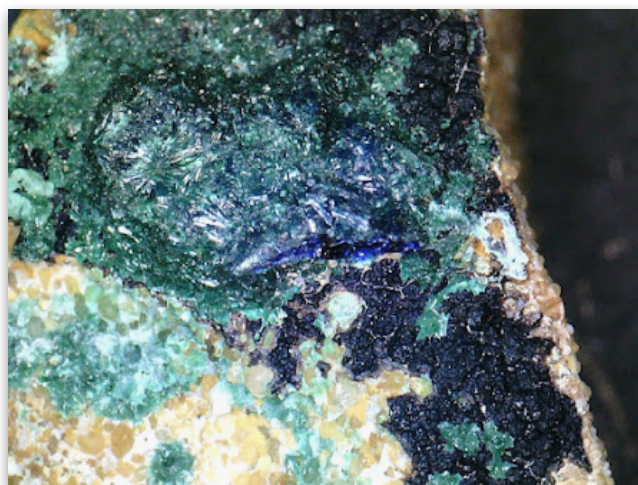






One of the earliest mining areas in the Lisbon Valley/La Sal District was originally organized in 1892 and generally went under the name of Big Indian Copper Mine with later mines and claims termed Blue Jay Claim, Blue Grotto Prospect, Nevada Claim, Blue Crystal Mine, and the Texas Claim. A copper processing mill was constructed in 1918 and mining continued sporadically for several decades. The ore body is comprised of oxidized copper minerals (see above) emplaced in the Cretaceous Dakota Sandstone along the downthrown side of the Lisbon Valley Fault; mining has been via open pit and tunnels. In the late 1970's prospectors started to notice beautiful azurite crystals and specimen collecting went into operation. For example, in 1988 a cut on the Nevada Claim produced one hundred thousand specimens of azurite rosettes (for collectors)

and 6000 pounds of broken nodules for paint pigment. Today the claims are generally referred to as the Blue Crystal Mines and the miner/operator is present at many mineral shows in the West, including Tucson (usually in the 22<sup>nd</sup> Street complex).



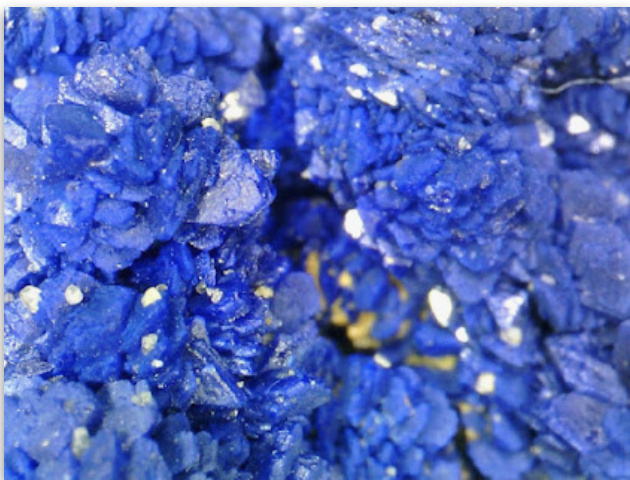
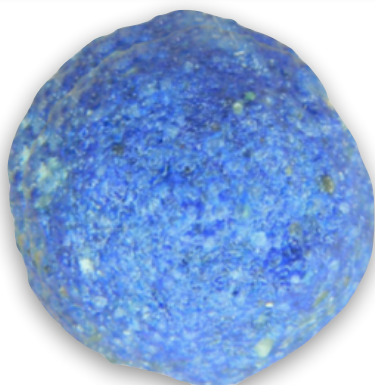
**Above:** A smear of blue azurite, mass of green malachite crystals, right corner black botryoidal crust of "manganese oxide," left corner matrix of well-rounded and iron-stained quartz grains. Width FOV ~ 1.0 cm.  
*Photo: M. Nelson*

The most unique of the specimens collected at the Blue Crystal Mine, then and now, are the "blueberries," small (up to a centimeter or two) concretions, often hollow, of micro azurite crystals — some contain tiny, rounded quartz grains mixed with azurite. I have not been able to locate information about their formation. However, it appears that tens of thousands of these "blueberries" have been collected over the decades. Rockhounds in Utah tell me that the mine is the single world source for these unique specimens. However, I have seen similar/ almost identical specimens from the El Chino Mine in New Mexico, and perhaps others.

The "azure colored" rosettes and crystal clusters "commonly occur as 3-8 cm masses of subparallel crystals and as individual crystals to 2.5 cm in length" (Hampson, 1993). The blueberries are much lighter in color, perhaps sky blue.



**Below:** Azurite “blueberry” (middle) with two photomicrographs of parallel stacked crystals.  
*Photos: M. Nelson*



I originally ordered the specimen due to its collecting location (Utah), and the fact that the mineral brochantite (one of my favorites) was listed as being present. However, not every purchase in the mineral world turns out as noted. I have never been able to identify brochantite on this thumbnail specimen!

MinDat has brochantite listed as present (without photos). However, Hampson (1992) stated “A number of old malachite specimens were incorrectly labeled brochantite; no brochantite has been reported from this location” (Dick Dayvault, pers.com). I agree with Hampson (at least in my specimen) that the tiny green radiating sprays, and the masses of tiny acicular green crystals are malachite.

However, all was not lost since one small side of the thumbnail has numerous light green octahedrons displayed. It turns out these crystals are cuprite that have been altered to malachite—an interesting pseudomorph.

#### REFERENCES CITED

Hampson, A. G., 1993, Minerals of the Big Indian Copper Mine San Juan County, Utah: *Rocks and Minerals*, v. 68, No. 6.

As the Rolling Stones noted in 1969 on their *Let It Bleed* album:

*No, you can't always get what you want  
You can't always get what you want  
You can't always get what you want  
But if you try sometime you find  
You get what you need*

Wow, that little ditty sometimes just sticks in my mind and takes me back a few years!! The trivia: that was a B side song, and the A side was Honky Tonk Women.



Mike is a former University professor and administrator who enjoys outdoor activities, and writing articles for the *Pick & Pack*, other rock and mineral clubs, and the Newsletter of the Rocky Mountain Federation of Mineralogical Societies ([www.rmfmns.org](http://www.rmfmns.org)). He also writes, and occasionally speaks, about members of the Colorado Cavalry/Infantry who participated in the march to Glorieta Pass (1862), helped settle central Kansas (1865), and later fought at Beecher Island (1868). In CSMS he heads up the Undergraduate Research Committee as introducing students to geology research is a long-time passion. But mostly he just tries to enjoy life with frosty IPAs, travel, and collecting mundane facts and pretty rocks/ minerals.

## Deadly Dance of the Mammoth and *Smilodon*

By Steven Wade Veatch

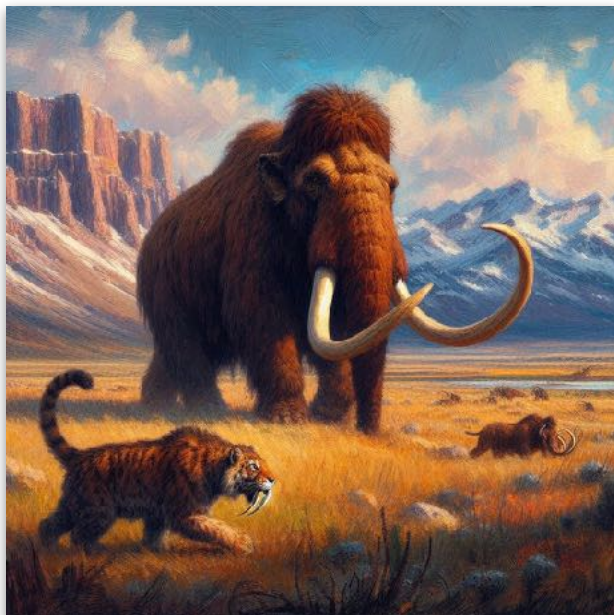
Above the mammoth the sky turns red  
as the sun rose, rising from its dawn bed.  
Soon the mighty beast would know,  
A new day starts where sheets of ice flow.

It was spring—a cold time of year—  
when mammoths keep their young near.  
A mammoth mother follows an ancient trail  
with her young in tow, so tiny and so frail.

Survival is not easy and is based largely on luck.  
As days lengthen and spring brings mud and muck.  
The insects buzz, grass turns green, and buds burst.  
Warmth brings pools of water to slake the mammoth's thirst.

There's been no sign of *Smilodon*—nothing yet to fear.  
The woodlands are quiet, only a sloth might appear  
The herds move together with their young for protection,  
but they make too much noise, unable to avoid detection.

A *Smilodon* comes to a halt, and smells the air,  
and the mammoths take off in a thundering scare.  
The herd will live in peace for another day  
As they rule the land and make their way.



A *Smilodon* stalks  
a mammoth.

Art generated by the author using AI.



# Why Does Hartsel Barite Turn Blue in the Sun?

Dennis Gertenbach

Those who have collected barite from Hartsel, Colorado, note that when barite crystals are first dug out of the ground, they are white, pale brown, or pale gray. But, when they are exposed to sunlight, they change to various shades of blue in an hour or two. Figure 1 below shows an example of this color change in a cluster of Hartsel barite crystals.



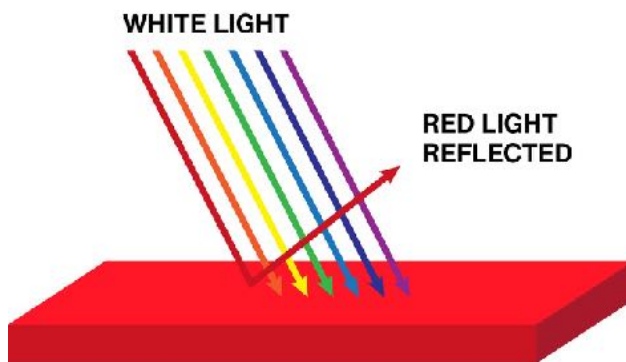
**Figure 1.** Hartsel Barite changes from white to blue when exposed to sunlight.

This color-changing phenomenon is called **tenebrescence**, and minerals with this property are called tenebrescent. When removed from sunlight, a tenebrescent mineral slowly reverts back to its original color. This effect can be repeated indefinitely, but heating will destroy this property.

This property is also known as photochromism; a good example of photochromism are self-adjusting sunglasses that darken in the sun and lighten indoors. Well-known tenebrescent minerals include hackmanite (a variety of sodalite), scapolite, and tugtupite.

## Light and Color

At this point, we need to diverge and talk about why a mineral or other solid is a specific color. From looking at a rainbow or light passing through a prism, we know that visible light is composed of different colors. When light falls on an object, some of the visible light colors are absorbed by the solid. The remaining visible light colors are reflected. The object's color that we see is the reflected light color or colors. Figure 2 shows an example. When visible light strikes a red object, the red light is reflected while the remaining light colors are absorbed and we see the object as red.



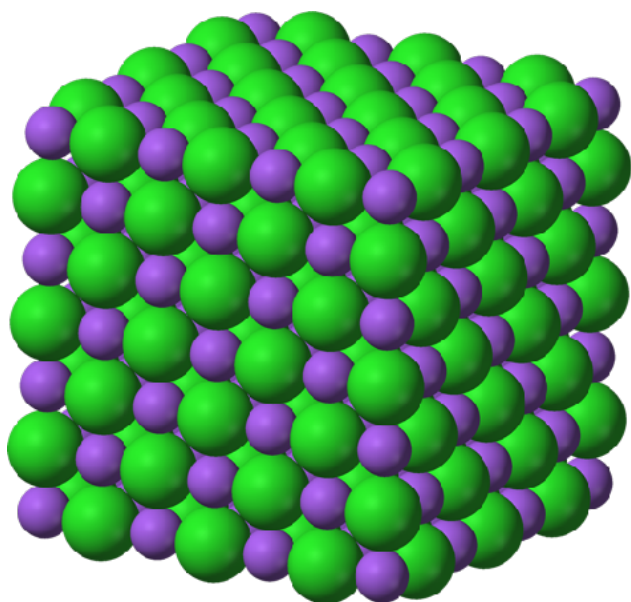
**Figure 2.** A red object looks red because red light is reflected, while the other light colors are absorbed in the object. Credit: Pantone.com, used by permission on their website.

If an object absorbs all the visible light colors and reflects none, it appears black. Likewise, if an object reflects all the visible light colors and reflects none, it appears white.

Continued...

### What Causes Hartsel Barite to Turn Blue?

The composition of barite is barium sulfate, which consists of an atom of barium joined together with a sulfate. Sulfate consists of one sulfur atom and four atoms of oxygen. In a barite crystal, the barium and sulfate are arranged side-by-side in a 3-dimensional pattern, as shown in Figure 3.



**Figure 3.** The 3-dimensional pattern of a barite crystal. The purple spheres are barium, and the green spheres are sulfate. Credit: Benjah-bmm27, public domain.

Most mineralogists agree that tenebrescence is caused by defects in this crystal pattern called F-centers. In the case of Hartsel barite, the crystals have defects to the arrangement of the barium and sulfate. Occasionally, a sulfate is missing and is replaced by two electrons. Each replacement of one sulfate in a crystal with two electrons is called an F-center. (The term F-center comes from the German word Farbe, meaning color.) These F-center electrons within the barite crystal absorb all light colors except blue, and the resulting reflected blue light gives the barite crystal its blue color.

When these electrons absorb the other light colors, they have more energy. Once the crystal is put in the dark, these electrons slowly lose this excess energy, reverting back to their original state. The F-center electrons no longer reflect blue light, causing the crystal to return to its original color.

### References and Additional Reading

For an overview of tenebrescent minerals, see "This Gemstone Switches Colours in an Instant," Geology In website, <https://www.geologyin.com/2018/01/this-gemstone-switches-colours-in.html>

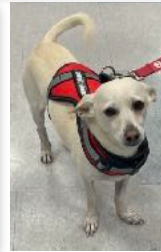
This reference gives a nice review of light and colors, Sudha, Sai (2022), "How Do We See Colors?" Smore Science website, <https://www.smorescience.com/how-do-we-see-colors/>

A simplified explanation of how F-centers cause tenebrescence can be found at "Hackmanite," Gemology Online website, <https://www.gemologyonline.com/hackmanite.html>.

For a much more in-depth explanation of tenebrescence, fluorescence, and other light properties of minerals, see Nassau, Kurt (1978), "The Origins of Color in Minerals," American Mineralogist, vol 63, p. 219-229, [http://www.minsocam.org/msa/collectors\\_corner/arc/color.htm/](http://www.minsocam.org/msa/collectors_corner/arc/color.htm/)

**[Editor's note:]** Reprinted with permission. First of three in a series of articles, by various authors at various times, selected by Bob Landgraf for reprint, for the purpose of exploring fluorescence in minerals.





## General Assembly 17 Oct 24

48 CSMS rockhounds gathered on a nice cool Colo Spgs evening at Colorado Springs Christian School to see Dave Ehler present the really great talk, "Discoveries in the Laramie Formation." It's called Laramie but the formation can be accessed right here in town! Thanks Dave! We heart Colorado too.

Business was conducted and led by CSMS pres Alex Field and VP Shane Riddle.

Free minerals were given away to new members and by raffle.

*Report and photos by J. Emery, editor*







**John Emery**  
Editor

Thanks to our contributors. We encourage everyone to submit articles, photos, illustrations or observations. Share your experiences, your new finds, or simply your enjoyment of our last field trip. Handwrite it, type it, or email it. Format does not matter. All submissions are welcome. The deadline for items to be included in the next Pick & Pack is the **last day of the month.**

To submit an item:

For hardcopy photos or articles, mail to the address below or bring them to the General Meeting. All hardcopy photos remain the property of the submitter and will be returned. Electronic photos can be submitted at resolutions above 200 dpi in any format.

Feature articles can be in MS Word or Mac Pages, preferably not pdf. The newsletter is produced in Mac Pages.

e-mail the editor:  
pickandpackeditor@gmail.com

Mail to: Pick & Pack Editor PO Box 2 Colorado Springs, CO 80901

The PICK & PACK is published ten times per year (no issues in January or August). Unless otherwise marked, materials from this publication may be reprinted. Please give credit to the author and CSMS PICK & PACK.

## Remember the Photo Slideshow?



I'm putting an open call out to see if anyone in our community has old slides they would like to donate to the club. So far, I've had the joy to digitize Ernie Hanlon and some of Ray Berry's slides and have really enjoyed getting the opportunity to learn more about minerals and our great club from years past. If you have slides and are interested, please reach out to me

directly (720) 253-8426 or [markwilliammann@gmail.com](mailto:markwilliammann@gmail.com) and I'll contact you about picking them up.



One of Ernie Hanlon's pictures from a CSMS dinner from the mid 1980s, now digitized.

## Western Museum of Mining and Industry

The CSMS and WMMI have a cooperative agreement. Be sure to visit the WMMI website and learn about this amazing museum.

<https://wmmi.org/>



**WESTERN MUSEUM OF  
MINING & INDUSTRY**

# 2024 RMFMS Editor Contest Results

2024 RMFMS Bulletin Contest				
(for items published in 2023)				
	Category	Editor or Author	Club	AFMS
<b>New Editor</b>				
1	The Rockhound Record, 12/2023	Joseph Philpott Jr	Mineralogical Society of Arizona	2
<b>Small Bulletins</b>				
2	The Ammonite, 11/2023	Deborah Vick	Western Dakota Gem & Mineral Society	4
<b>Large Bulletins</b>				
1	Flatirons Facets, 7-8/2023	Dennis Gertenbach	Flatirons Mineral Club	4
2	CSMS Pick & Pack, 3/2023	John Emery	Colorado Springs Mineralogical Society	10
DE- AFMS	Jade State News, 9/2023	Ilene Olson	Wyoming State Mineral & Gem Society	6
<b>Adult Articles</b>				
1	My Visit: The Ben E. Clement Museum	Shane Riddle	Colorado Springs Mineralogical Society	8
2	A Fish Tail, Part 1 - Good Karma!	Nancy Kimber	Flatirons Mineral Club	HM
3	X-ray Microtomography Solves Mystery	Harlin Unruh	McPherson Gem & Mineral Club	9
4-HM	Eyes and Stars	Robin Johnson	McPherson Gem & Mineral Club	
5-HM	Teen Wins Multiple Awards with Jade and Jewelry	Jim Gray	Wyoming Stage Mineral and Gem Society	
	The Inverted Topography OF The Pawnee Grasslands	Char & Mel Bourg	Flatirons Mineral Club	
	Collection Spotlight: Hannah Brodhagen	Cameron Reichert	Mineralogical Society of Arizona	
	Fishing in the Eocene	Trick Runions	Flatirons Facets	
	Picture Jasper	Marv Dahmen	McPherson Gem & Mineral Society	
	Turquoise	Jana Dahmen	McPherson Gem & Mineral Club	
	Cursed Jewels and Criminal Element of Jewelry	Lisha Collins	McPherson Gem & Mineral Club	
<b>Adult Articles Advanced</b>				
1	The Florissant Fossil Beds, Colorado: A Place of Change, 4/2023	Steven Wade Veatch	Colorado Springs Mineralogical Society	3
2	Arizona's Copper Minerals, 12/2023	Les Presmyk	Mineralogical Society of Arizona	1
3	Call to Action: Rockhounds and outdoor enthusiasts need to provide input about restrictive BLM land-use plan, 9/2023	Greg Jones	Wyoming State Mineral & Gem Society	7
4	Mineral of the Month: Copper, 12/2023	Dr. Raymond Grant	Mineralogical Society of Arizona	
DE-AFMS	Why Does Hartsel Barite Turn Blue in the Sun?	Dennis Gertenbach	Flatirons Mineral Club	2



# 2024 RMFMS Editor Contest Results

<b>2024 RMFMS Bulletin Contest</b>				
<i>(for items published in 2023)</i>				
	<b>Category</b>	<b>Editor or Author</b>	<b>Club</b>	<b>AFMS</b>
<b>Jr. Articles, under 12</b>				
1	Combat Rock Field Trip	Emilyn Bubb (10)	Flatirons Mineral Club	4
2	How to Make Your Own Pottery Clay at Home (FROM DIRT)	Eian Link (11)	Flatirons Mineral Club	3
3	Double Header Mine Report	Axel Gray (8)	Flatirons Mineral Club	6
<b>Jr. Articles, 12-17</b>				
1	<i>History of Opabinia</i>	Charlotte Small (15)	Flatirons Mineral Club	1
2	White River Formation	Daniel Bonvillian (13)	Flatirons Mineral Club	2
3	What We Like to Collect	William Elek (13)	Flatirons Mineral Club	4
<b>Written Features</b>				
1	President's Message, 11-12/ 2023	Brian Walko	Flatirons Mineral Club	9
2	Calumet Mine Field Trip, 9-10/2023	Doran Adams	Flatirons Mineral Club	2
3	Valley of Fire State Park & the Royston Turquoise Mine, 12/2023	Cameron Reichert	Mineralogical Society of Arizona	HM
4-HM	Member Profile: Brian Walko, 11-12/2023	Anita Colin	Flatirons Mineral Club	
5-HM	A Temporary Goodbye, 7/2023	Emily Nelson	McPherson Gem & Mineral Club	
	Planet Mine Trip Report, 12/2023	Joseph Philpott, Jr.	Mineralogical Society of Arizona	
	Day Tripping in Kansas, 3/2023	Jim Brown	McPherson Gem & Mineral Club	
<b>Drawn Features</b>				
1	<i>Stegosaurus - Colorado State Fossil</i>	Steven Wade Veatch	Colorado Springs Mineralogical Society	2
2	Fossil of the Month: <i>Pikaia</i>	Charlotte Small	Flatirons Mineral Club	3
<b>Photo Collage</b>				
1	Meeting Highlights, 12/2023	Joseph Philpott, Jr.	Mineralogical Society of Arizona	
2	Photos from the Florissant Field Trip, 9-10/2023	Rebecca Stetson	Flatirons Mineral Club	
<b>Adult Poetry</b>				
1				
2	Grandpa's Rockhound Delight, 12/2023	David St. John	Colorado Springs Mineralogical Society	3
DE-AFMS	Time in Florissant, 4/2023	Steven Wade Veatch	Colorado Springs Mineralogical Society	2
<b>Special Publications</b>				
1	DGMG 2024 Club Calendar, 9/2023	Caleb Smith	Denver Gem & Mineral Guild	1
2	Grey's Prehistoric World, Paleozoic Edition, 12/2023	Charlotte Small	Flatirons Mineral Club	3
3	NCAR Labs Geology, Boulder, CO, 8/2023	Will Rehm	Flatirons Mineral Club	4

## CSMS Results - 2024 RMFMS Editor's Contest

*The Florissant Fossil Beds, Colorado: A Place of Change*, Steven Wade Veatch, **1st Place**

*My Visit: The Ben E. Clement Museum*, Shane Riddle, **1st Place**

"Stegosaurus - Colorado State Fossil," Steven Wade Veatch, **1st Place**

*Grandpa's Rockhound Delight*, David St. John, **2nd Place**

CSMS Pick & Pack, John D. Emery, Editor, **2nd Place**





Pick & Pack  
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**CSMS is an incorporated nonprofit organization with the following goals:**

- To promote and disseminate knowledge of the earth sciences, especially as they relate to mineralogy, lapidary, and fossils.
- To encourage study, collection, and fashioning of minerals.
- To accomplish the same through social meetings, lectures, programs, displays, shows, and field trips.
- The Pick & Pack newsletter is published 10 times each year to assist and promote the above.

**Joining the Colorado Springs Mineralogical Society (CSMS):**

- Meetings are held the third (3rd) Thursday of each month, except January & August.
- 7:00 PM at Mt. Carmel Veterans Service Center; 530 Communication Circle, Colorado Springs, CO 80905
- Visitors are always welcome.
- Individuals—\$30, Family—\$40, Juniors—\$15, Corporate—\$100.
- Find the application at the web site: [www.csms1936.com](http://www.csms1936.com). If you are interested in joining CSMS or would like more information, we encourage you to attend our next General Meeting or visit our web site.

**Meetings:** CSMS also offers Satellite Group meetings that allow more focused attention in specific areas of our members' interests. Our current Satellite Groups consist of the following: Crystal Study Group, Faceting Group, Fossil Group, Lapidary Group, and Pebble Pups/ Juniors. For details on Satellite Group meetings, check out the calendars on page 2 and the web site.

**Membership Benefits:** Yearly dues include 10 issues of the *PICK & PACK*, all field trips (additional fees may be required on some field trips, and members are responsible for all transportation to and from), participation in all Satellite Groups (some groups may request additional fees to help cover resource costs), a year of learning and enjoyment, plus a lifetime of memories.

**Colorado Springs Mineralogical Society is a Member of the following organizations:**

- American Federation of Mineralogical Societies (AFMS) [www.amfed.org](http://www.amfed.org)
- Rocky Mountain Federation of Mineralogical Societies (RMFMS) [www.rmfmms.org](http://www.rmfmms.org)