



Colorado Springs Mineralogical Society

Founded 1936

~ Lazard Cahn ~

Honorary President

"Pick & Pack"

Volume 62 No. 2

March 2022

CSMS General Assembly

Thursday, March 17, 2022 7:00 PM

Mt. Carmel Veterans Center

Program Speaker:

Steven Wade Veatch

"Things Left Behind: An Intimate Time with Spencer and Julie Penrose"

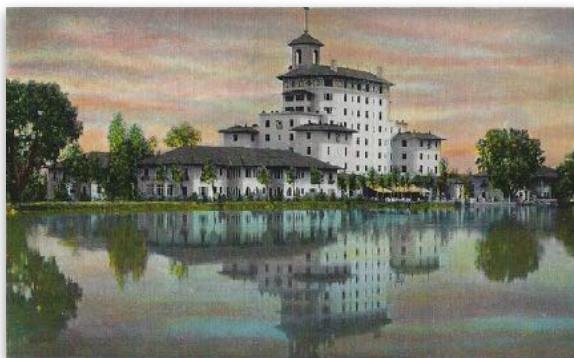
In case of inclement weather please call Mt. Carmel Veteran's Service Center 719-309-4714

In This Issue ...

| | |
|--|---------|
| Business/ Upcoming Events | 1 - 5 |
| Article - S. Veatch, <i>The Castle Rock Quarries: A Building Stone Bonanza</i> , part 1 of a 3-part series | 6 - 11 |
| Assembly pics - General, Crystal | 12 |
| Poem - S. Veatch, <i>Beside the Waterfall</i> | 13 |
| Article - M. Nelson, <i>Jöns Jacob Berzelius: A Great Mineral Chemist Defines the Selenides</i> | 14 - 19 |
| Classifieds and Announcements | 20 - 21 |

"Things Left Behind: An Intimate Time with Spencer and Julie Penrose" by S.W. Veatch

Spencer Penrose made a fortune mining gold in Cripple Creek and then copper in Utah. After investing his money, he molded the Pikes Peak region into a tourist mecca by building the Broadmoor Hotel and other attractions. Both Spencer and Julie Penrose made significant contributions to the business, social, and philanthropic communities of the Pikes Peak region. Join Steven Veatch as he shares Penrose rocks, gold ore, stories, historic photographs, and artifacts from when his grandfather was the private secretary for Spencer Penrose and later Julie Penrose. Veatch relies on these Penrose artifacts, charged with emotion and memories, to provide an intimate look into their lives and personalities.



Steven Veatch is a member of the Colorado Springs Mineralogical Society, the Lake George Gem and Mineral Club, the Cañon City Geology Club, Grand Traverse Area Rock and Mineral Club, and the Central Michigan Lapidary and Mineral Society. He is a 2015 National Rockhound & Lapidary Hall of Fame inductee. He volunteers at the Cripple Creek District Museum and the Benzie Area Historical Society and Museum. He spends time at his cabin near Divide Colorado and on the shores of Duck Lake, Michigan.



COLORADO SPRINGS MINERALOGICAL SOCIETY PO BOX 2 COLORADO SPRINGS, COLORADO 809801-0002

CSMS Group Calendar

| Mar '22 | Apr '22 | | | | | | |
|---------|---------|----------------|----------|---------|-------------------|----------------|--------------|
| 1 Mar | 5 Apr | Fossil Group | 1st Tues | 7:00 PM | TBD | Jerry Suchan | 303-648-3410 |
| 3 Mar | 7 Apr | Board Meeting | 1st Thur | 6:00 PM | Zoom | John Massie | 719-338-4276 |
| 17 Mar | 21 Apr | Pebble Pups | 3rd Thur | 5:30 PM | Mt. Carmel Center | David St. John | 719-424-9852 |
| 17 Mar | 21 Apr | General Assy | 3rd Thur | 7:00 PM | Mt. Carmel Center | John Massie | 719-338-4276 |
| 24 Mar | 28 Apr | Crystal Group | 4th Thur | 7:00 PM | Mt. Carmel Center | 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 House | Sharon Holte | 719-217-5683 |

CSMS Club Events

June 10-12, 2022: Pikes Peak Gem, Mineral and Jewelry Show, Norris Penrose Event Center, Colorado Springs. Friday, June 10, Noon - 7:00 PM, Saturday, June 11, 10:00 - 5:00, Sunday, June 12 - 4:00.

Community Events (P. Modreski)


Mar 13: "Visits with History," presented by the Cripple Creek District Museum. *Cripple Creek's Cresson Mine: The Untold Stories*, by Steven Veatch. 2 - 4 PM, free admission, call 719-689-9540 to reserve a seat.

Mar 17: 7:00 p.m., Colorado Scientific Society meeting, via Zoom, all are welcome: *Comparing Stratigraphic Architecture and Petroleum Systems Across the South Atlantic Margin*, by Katie-Joe McDonough, Friso Brouwer, Brian W. Horn, and Kyle R. Reube; and *Atlantic Volcanoes: Activity in 2021 and challenges for geoconservation*, by Thomas Casadevall, U.S. Geological Survey. See the CSS website for login links; <https://coloscisoc.org/>

Mar 25-27: Fort Collins Gem & Mineral Show, Ranch/Larimer County Fairgrounds, Thomas M. McKee Building, 5280 Arena Circle, Loveland, CO. 4-8 PM Friday; 9-6 Sat; 10-5 Sun. Sponsored by the Fort Collins Rockhounds Club.

June 10-12: Pikes Peak Gem, Mineral and Jewelry Show, Norris Penrose Event Center, Colorado Springs. Friday, June 10 Noon - 7:00, Saturday, June 11 10:00 - 5:00, Sunday, June 12 10:00 - 4:00.


June 16: Victor Gem and Mineral Show // Thursday, June 16 - set-up; Show June 17 to 19, 2022. For additional information contact RuthZalewski.info@stcfq.com 719-689-2675 or 719-651-2714.



*Presented by the
Cripple Creek District Museum*

**CRIPPLE CREEK'S CRESSON MINE:
THE UNTOLD STORIES**

BY STEVEN VEATCH



SUNDAY, MARCH 13
CRIPPLE CREEK HERITAGE CENTER
2-4 P.M.
RESERVATIONS RECOMMENDED - FREE ADMISSION
719-689-9540

Secretary's Spot

John McGrath

2022 CSMS Officers

John Massie, President
Rick Jackson, 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
Sharon Holte, Past President

2022 CSMS Chairpersons

Rick Jackson, Program Coordinator
John Massie, Show Vol Coordinator
Kyle Atkinson, Field Trip Coordinator
Vacant, Science Fair Chair
Frank and Ellie Rosenberg, Librarians
Mark Schultz, Social Committee Chair
Ann Proctor, Store Keeper
Lisa Cooper, Show Chairman
Lisa Cooper, Webmaster
Lisa Cooper, Facebook Keeper
Mike Nelson, Federation Rep

CSMS General Assembly Minutes

Mt. Carmel Vet Center, Thur Feb 17, 2022 7:00 PM

Address: 530 Communications Circle, Colorado Springs CO 80905

Board Attendance:

President: John Massie, Vice President: Richard Jackson, Editor: John Emery
Member-at-Large: Chris Burris, Member-at-Large: Bill Myers, Secretary: John McGrath,
Membership Secretary: Adelaide Bahr

Agenda:

- I Meeting called to order by CSMS President, John Massie at 7:04 PM
- II Pledge of Allegiance was led by John Massie
- III Introduction of Guests: None
- IV Introduction of new members by Adelaide Bahr - Membership Secretary
 - Sara Frear, Lorrie Hutchinson
- V Program Speaker introduced by Rick Jackson. The Speaker was Ray Quinn, long-time member and rock/fossil collector since his youth. His Topic was "Collecting in Colorado Springs".

A. Key Points

- a. Colorado is the US State with the third highest quantity of different minerals.
- b. Over 300 Minerals in Pikes Peak Batholith area which includes COS region.
- c. His first finds were Fossils on Fort Carson in the area of new construction.
- d. He has found fossils in Fountain and Monument Creeks and recommends visiting the creeks after floods.
- e. He donated a large fossil find to the Pioneer Museum
- f. He has found barite and calcite in boulders located on the west side of I25 South of the Mesa Ridge exit. Unclear if this is private property but continues undaunted.
- g. He reports collecting selenite on the rock dome near South Circle as well as fossils in a bypass on Las Vegas, in south COS.
- h. Specimen Rock (38 48'30.2"N 104 55'15.6"W) Is a difficult (young Rockhound) hike from intersection of Lower Gold Camp, High Dr and Bear Creek Rd, but has large amounts of microcline (Feldspar, Smoky Quartz, Siderite, Hematite and Fluorite). A stream is nearby (Hunters Run) but eating the protected Cutthroat Trout is not endorsed by the CSMS.

- i. He even reported finding fossils in Bear Creek Dog Park but steadfastly denied digging on City land.

VI Meeting Notes

- A. There were 27 Members present and 4 new members in attendance. 6 minerals were given out by lottery.
- B. The January 2022 General Meeting Notes were approved by Voice Acclamation

VII Officer Reports

- A. Vice - President - Rick Jackson, no report
- B. Treasurer - Ann Proctor, Absent
- C. Secretary - John McGrath, No Report
- D. Membership Secretary - Adelaide Bahr, reported we are close to 100 members and approximately 20 Life Members
- E. Editor - John Emery, he requested submissions to the Pick and Pack.
- F. Members at Large - Chris Burris, no report. Bill Myer, no report.
- G. Past President- Sharon Holte, Absent
- H. Website Coordinator - Lisa Kinder, Absent

VIII Satellite Groups

- A. Crystal Group - Frank Rosenberg reported that the next meeting would be this coming Thursday at this location
- B. Faceting Group - John Massie encourage interested parties to contact him and reported that: a. On March 1st at the Senior Center on North Hancock there would be a class from 1-3 PM.
- C. Pebble Pups - David St John reported:
 - 1) The 8Feb22 Outreach program at the Broadmoor Scout Meeting had over 50 Scouts in attendance.
 - 2) He informed the group that plans were in formation for a Corral Bluffs trip in April focused on Boy Scouts
 - 3) He stated that he is in planning stages for a CSMS presence at the Western Mining Museum STEM day in March.
- D. Fossil Group - J. Suchan, not present, but J. Massie reported that they are still searching for a suitable meeting location
- E. Jewelry Group is in search of a chairperson
- F. Lapidary Group - Sharon Holte, absent.

IX Liaisons

- A. Claims - Frank Rosenberg, present, but no report
- B. Social Coordinator - Mark Schultz, thanked everyone for the deserts.
- C. Store Keeper - Ann Proctor Not Present

X Unfinished Business - John Massie requested liaisons for the Science Fair, Pebble Pubs and Friends of the Fossil Beds

XI New Business - John Massie reminded members that the Pikes Peak Gem Show will be held June 10th -12th at the Penrose Equestrian Center and volunteers were need beginning on the 9th for set up.

XII Meeting Adjourned by John Massie at 8:29 PM

Respectfully submitted, John M McGrath MD COL (RET) USA



President's Corner

John Massie
CSMS President



2022 Satellite Group Chairs

Kevin Witte/ Bob Germano, Crystals
John Massie/ Bertha Medina, Faceting
Jerry Suchan/ Joy Price, Fossils
Vacant, Jewelry
Sharon Holte, Lapidary
Vacant, Micro-mount
Vacant, Photography
David St. John/ Hair/ Elick, Pebble Pups

2022 Liaisons

Florissant Fossil Beds National Monument:
S.W. Veatch

Western Museum of Mining and History:
S.W. Veatch



Presidential Matters



A message from CSMS President John Massie:

I am looking forward to an amazing Summer. We will start it off with the Pikes Peak Gem, Mineral, and Jewelry Show. The show will be on June 10, 11, and 12. We will set up on June 9. We will need volunteers to help with the setup, tickets, silent auction, hospitality table, and tear down after the show on Sunday. Volunteers get free admission to the show.

We are also in the process of scheduling several field trips to our claims and other locations this summer.

I hope everyone joins me for a great year.

John Massie
CSMS President





Federation News Post

American Federation of Mineralogical Societies
Rocky Mountain Federation of Mineralogical Societies



American Federation Rockhound Information

- [William Holland School of Lapidary Arts \(Young Harris, GA\)](#)
- [Wild Acres Retreat \(Little Switzerland, NC\)](#)
- [Bureau of Land Management](#)
- [Crystallography](#)
- [U.S. Geologic Survey Topographic Maps](#)
- [TopoZone](#) - Topographic maps of the U.S. online

AFMS Scholarship Fund numbers 2022:

| | |
|--------------------------------------|--------------------|
| Albuquerque Gem & Mineral Club | \$25.00 |
| Judy Beck | \$50.00 |
| North Central Kansas Rock & Gem Club | \$200.00 |
| RMFMS | \$4,139.65 |
| So. Nev. Gem & Mineral Society | \$755.00 |
| Shawnee Gem & Mineral Club | \$3,829.03 |
| Topeka Gem & Mineral Society | \$588.20 |
| Tulsa Rock & Mineral Society | \$421.00 |
| Western Dakota Gem & Mineral Society | \$100.00 |
| Wichita Gem & Mineral Society | \$350.00 |
| Total Donations | \$10,457.88 |



Future RMFMS Convention Locations

- 2022, May 7-8 - Las Vegas, NV

Local Club Shows

- Notify other clubs in our federation about your upcoming show, [email the editor](#)
- For Member Club Show general information go to the [RMFMS Club Lists](#) page and check the club or city you are interested in.
- Want to see the shows in your state? Visit the Rock and Gem Magazine's Show page and select the state you are interested in: [Rock and Gem Magazine's Show Page](#)
- Please use the following link to the RMFMS Editor Google Drive to download the January 2022 edition of the Rocky Mountain Federation News: [RMFMS Editor Google Drive](#)
 - The RMFMS Newsletter is also available at [RMFMS.org](#)

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.

The Castle Rock Quarries: A Building Stone Bonanza

Part 1 of a 3-part article by Steven Wade Veatch

Introduction

About 36.7 million years ago, the ground shook when a violent volcanic eruption started from a caldera near Colorado's present-day Mt. Princeton (Meyer, 2003). From this location hot ash spewed from fiery fissures and, in a glowing cloud, swept across the landscape for 84 miles reaching Castle Rock in an hour (Matthews, 2009). This material cooled, compacted, and formed the Wall Mountain Tuff, a welded ash of rhyolitic composition (Izett and others, 1969; Epis and Chapin, 1974). Rhyolite is mineralogically related to granite, as it is composed mostly of quartz, sanidine, and biotite (Thorson, 2005). Wall Mountain Tuff, known locally as "Castle Rock Rhyolite," is about 60 feet thick and is found on mesa tops near Castle Rock (Thorson, 2004).

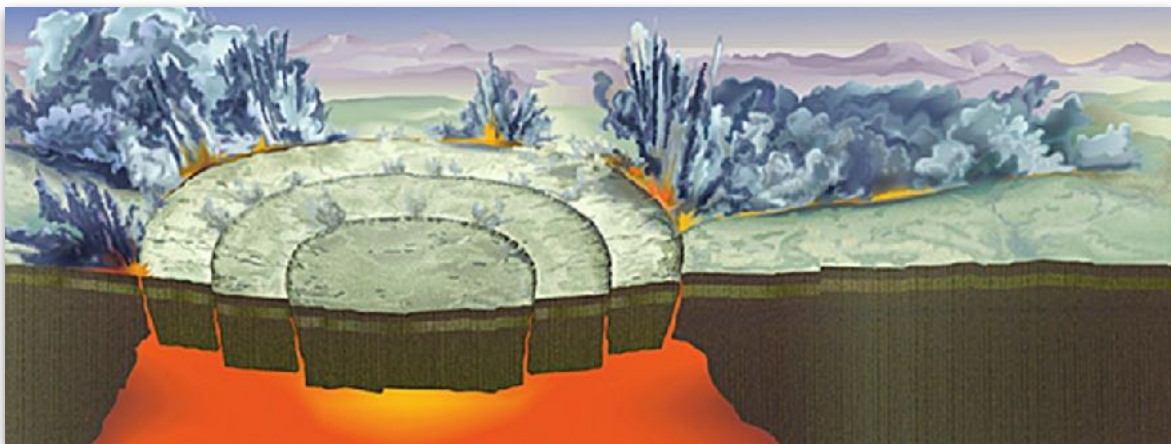


Fig 1: An artist's rendering of the cataclysmic eruption of the Wall Mountain ash flow near present-day Mt. Princeton 36.7 million years ago. This superheated cloud of hot ash and gas deposited a large volume of material. *From Matthews, 2009, used with permission.*

Today, Castle Rock Butte rises abruptly from the plains, east of Interstate 25, between Denver and Colorado Springs. Castle Rock Butte is one of several promontories in the area that are more resistant to erosion because they are capped by a hard sedimentary rock known as the Castle Rock Conglomerate (Chronic and Williams, 2014; Koch and others, 2018). This conglomerate formed about 34.7 million years ago from the sand and pebbles washed in from the mountains to the west and southwest (Thorson, 2004). Below this conglomerate is the older Castle Rock Rhyolite.

The Castle Rock Rhyolite, ranging in color from pink to gray, has a fine-grained texture and a high silica content, and breaks with a sharp conchoidal (curved or scalloped shaped) fracture. Because of its light weight and durability, it became an important decorative building stone used for facades, windowsills, trim, foundations, and garden walls in Denver-area commercial buildings, churches, train depots, and residences built in the late 1800s (Castle Rock Journal, 1900). The rhyolite also saw some use in other areas of the state. The stone has

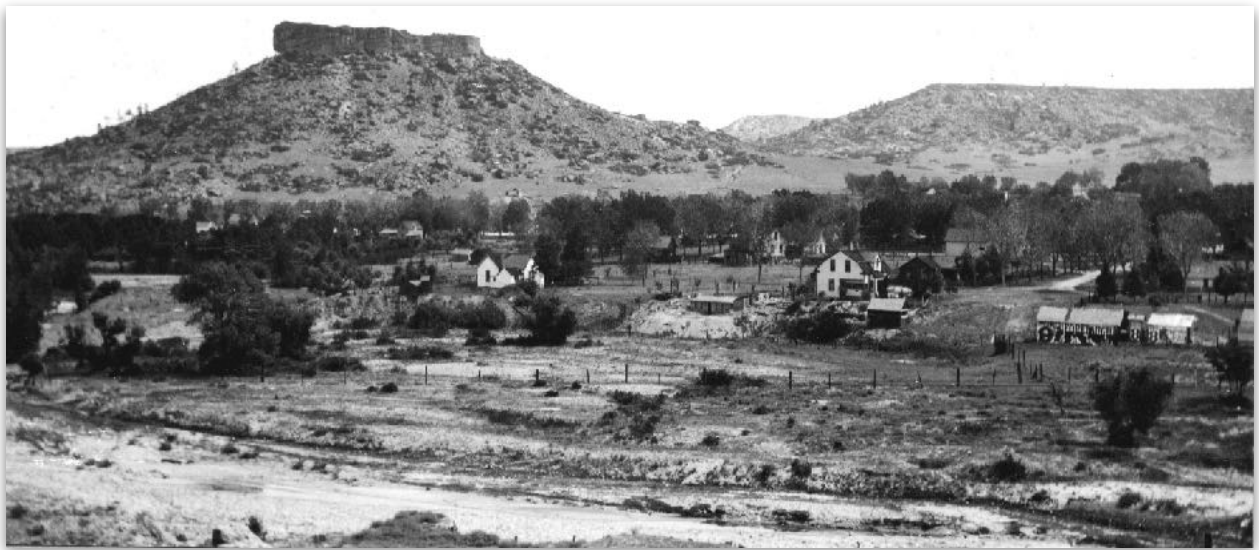


Fig 2: The town of Castle Rock and Castle Rock Butte (looking north). Douglas County, Colorado.
Photo date 1913. Plate 4 in U.S. Geological Survey. Folio 198. 1915. U.S. Geological Survey. Photographer: George Burr Richardson.

a rough surface texture that produces a play of light and shadows, an attractive effect that interested architects of that time (Murphy, 1992). Three main quarries produced rhyolite building stone: the Madge quarry started in 1872, followed by the O'Brien quarry organized in 1881 and started operations in 1882, and then the Santa Fe quarry in 1889.



Fig 3: Castle Rock Rhyolite was once a glowing, hot volcanic ash flow that spread across the landscape. This extrusive volcanic rock weathers to a light brown, lavender, pink, reddish brown, or maroon color.
Photo date 2020 by Ben Elick.



Fig 4: A block of Castle Rock Rhyolite showing flow banding and spherulites that formed when it was molten.
Photo date 2020 by Ben Elick.

Continued ...

Madge Quarry

In 1872 a Douglas County rancher, Silas Madge, dug prospect holes atop a mesa on his ranch just two miles south of Castle Rock (Harvey and Harvey, 1946). Instead of gold, he found rhyolite and learned that it had value as a building stone (Ormes, 1992). In Denver and in Colorado Springs, the market for building stones was excellent and growing. Madge signed a contract to provide stone for the Antlers Hotel in Colorado Springs and for several buildings on the Colorado College campus.

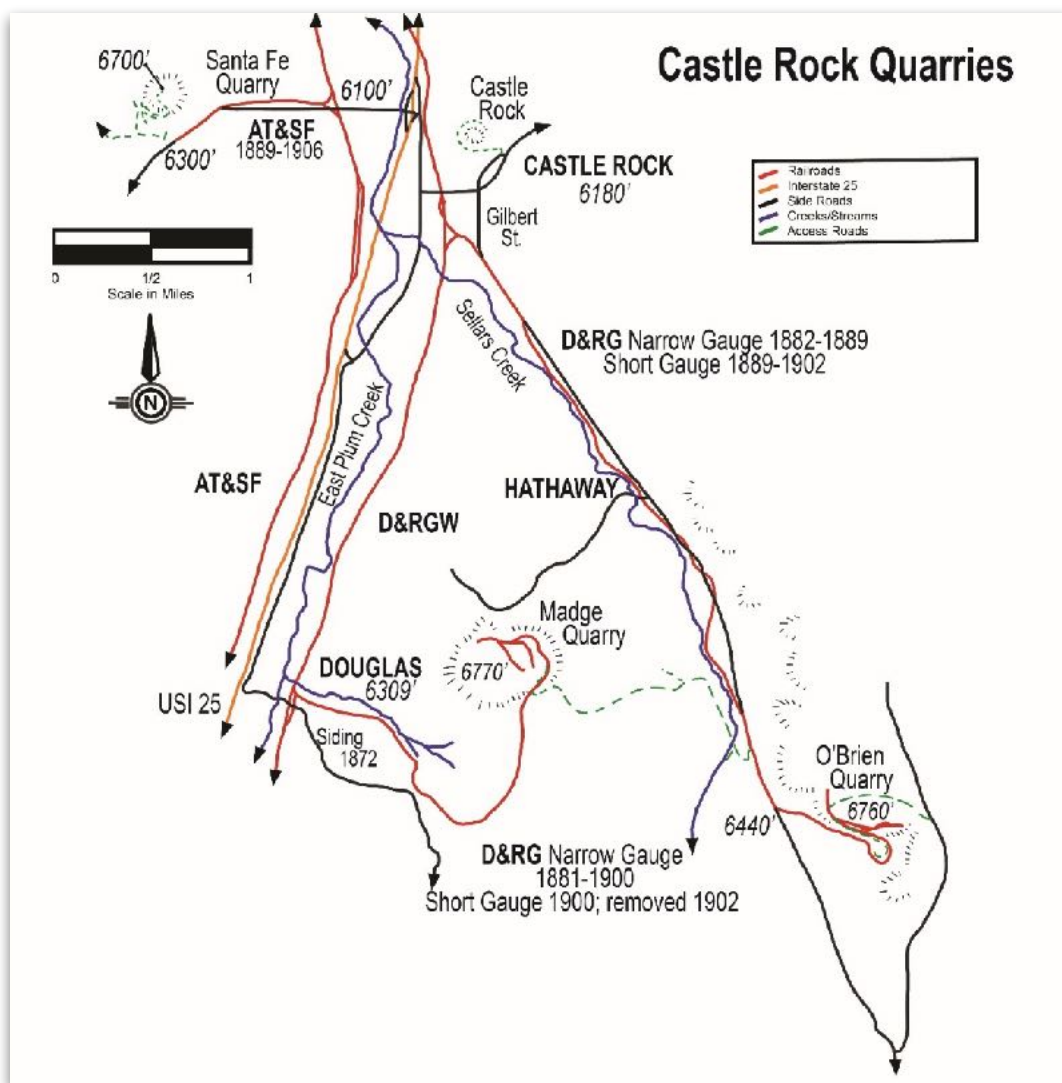


Fig 5: Map of the Castle Rock area showing the Madge, O'Brien, and Santa Fe quarries. Modified from Ormes, 1992.

Silas Madge built a road to the top of his mesa, 500 feet above the plains (Harvey and Harvey, 1946). Next, he and his ranch hands cleared the loose dirt and rock and opened a quarry. By 1882, Madge had a crew of 70 men, largely from Sweden, working in the quarry. (Some of their descendants still live in the area today.) Quarrymen performed all the work by hand using chisels, hammers, and other simple tools.

Continued ...

The Denver and Rio Grande narrow-gauge railroad came to Castle Rock in 1871. By 1872, there was a railroad spur at Douglas siding, near the Madge quarry (Harvey and Harvey, 1946). This allowed Madge to ship rock brought down from the quarry by horse-drawn wagons (Murphy, 1992). Business boomed and by 1874 thousands of tons of “lava rock” had been shipped.

In 1880, the town of Douglas, home to several hundred residents, was established and grew because of Silas Madge’s quarry. Madge built a boarding house there a year later. By 1881, the Denver & Rio Grande extended tracks from Douglas to the Madge quarry (Ormes, 1992).



Fig 6: View of the Madge quarry, later known as the Douglas quarry. Wagons are loaded with blocks of rhyolite. Unknown photographer. Photo date circa 1890s. Courtesy Douglas County Libraries Archives & Local History, no. 1997.011.0678.0002.

On February 1, 1882, a private school opened in Douglas with the primary purpose to teach the Swedish workers English. Apparently, the quarrymen were more interested in studying the charming teacher, Miss Wreck, than studying English (Harvey and Harvey, 1946).

It was hard pick-and-shovel work at the Madge quarry in those days. Work. Hard work. The quarry was hot as a blister—the stone walls absorbed and reflected the blazing heat of the summer sun. Men hauled water in each day to keep the quarrymen hydrated. It took a day and a half for workers using a double jack to drill a hole 20 feet deep. A powder man would fill the hole with black powder and then light the fuse to detonate the charge. After the explosion, the men, using crowbars, would break out rock along the cracks and seams in the blast-fractured rhyolite. Stonemasons squared the rhyolite rocks and then loaded them by derrick onto the train for shipment. The quarry shipped stone in pieces that weighed about 100 pounds.

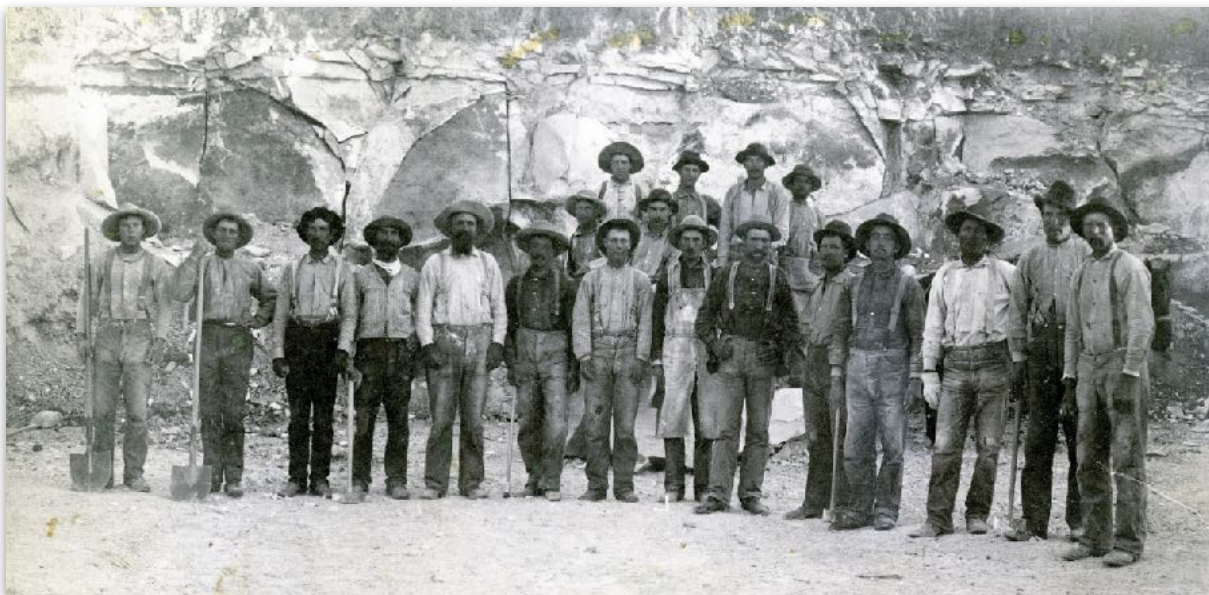


Fig 7: Quarrymen pose at the Madge quarry, later known as the Douglas quarry. Some workers hold shovels, others hold sledgehammers. *Unknown photographer. Photo date circa 1890s. Courtesy Douglas County Libraries Archives & Local History, no. 1997.011.0678.0001.*

The quarrymen earned \$2.50 a day. After spending \$4.50 per week on board, they had little left to show for all their work in the quarry (Harvey and Harvey, 1946). They spent most of their pay in Castle Rock businesses. Local saloons were a favorite place to go. Under a canopy of cigar smoke the quarrymen played cards and pool and relaxed. Sometimes fights broke out after they drank too much.

The quarrymen's work was difficult and dangerous, and claimed the lives of a few of them. While cutting stone for the Antlers Hotel, a fatal accident took place when a train engine, backing up, hit a flatcar that was buried in snow. The flatcar cut off a conductor's leg at the knee. Despite the efforts of the engineer to save him, the conductor died. A second fatality occurred in 1883, while a train was coming up from Douglas to Madge's quarry. A rail moved from its tie and caused the track to spread apart. As a result, the train and engine fell over, crushing George H. Parks, the engineer to death (Harvey and Harvey, 1946). A young quarryman, A. A. Anderson, had his toe severed in an accident at the Madge quarry and was laid up for a few weeks (Harvey and Harvey, 1946).



Fig 8: Abandoned Madge quarry mid-1990s. This view shows the thickness of the Castle Rock Rhyolite deposit, in some places up to 60 feet. Today this site is part of the Rhyolite Regional Park. *Photo date 1995 by S.W. Veatch.*



Fig 9: Closeup view of the Madge quarry. Photo date 1995 by S. W.



Fig 10: Fracture pattern in the Castle Rock Rhyolite from a blast during quarrying at the Madge quarry. Photo date 1995 by S. W. Veatch.

To be continued. Next issue: the O'Brien and Santa Fe Quarries

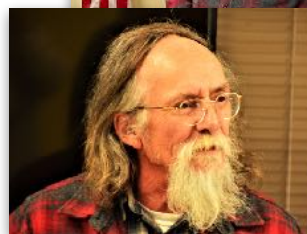
Acknowledgments

I thank Ben Elick for preparing and modifying the map used for this paper and for obtaining photos of Castle Rock Rhyolite. I thank Shelly Veatch and the Colorado Springs Oyster Club critique group for reviewing the manuscript, and Dr. Bob Carnein for his valuable comments and help in improving this paper.

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- Thorson, J. P. 2005, Geologic Map of the Castle rock north quadrangle, Douglas County, Colorado. Open-File Report 05-2. Colorado Geological Survey, Division of Minerals and Geology Dept. of Natural Resources Denver, CO.

CSMS General Assembly 17 Feb 2022 and Crystal Group 24 Feb 22



Crystal Group and General Assembly

CSMS Club Member Ray Quinn spoke to the General Assembly 17 Feb 22, where he presented maps and artifacts and the stories behind some of his most interesting finds while collecting in the Pikes Peak Region.

CSMS Club Member Kevin Witte spoke to the Crystal Group 24 Feb 22 about collecting Topaz in Colorado.



Beside the Waterfall

By Steven Wade Veatch

Fountain Creek rushes

Over granite and sandstone

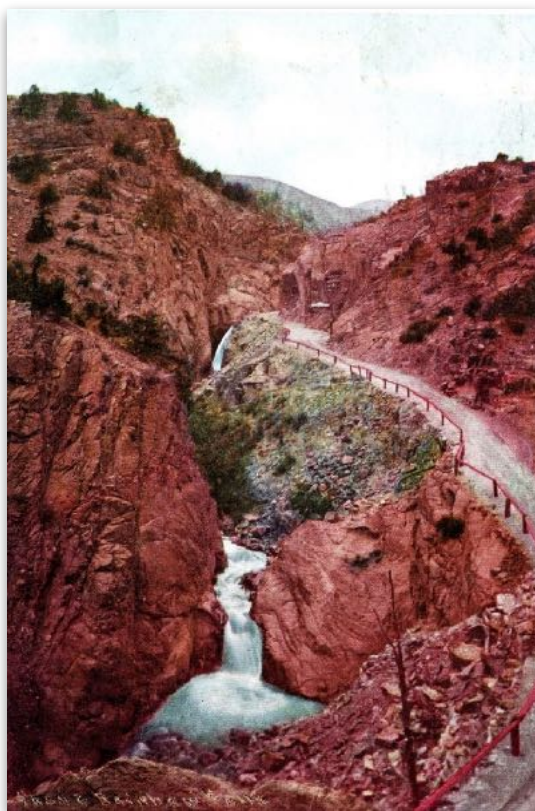
And plunging falls form

Uncovering layers of time

Revealing the history of the Earth

While beside the waterfall

My days flow by as fast



Fountain Creek running through Ute Pass.

From the postcard collection of S. W. Veatch

Jöns Jacob Berzelius: A Great Mineral Chemist Defines the Selenides

Mike Nelson
csrockguy@yahoo.com

This has been a tough subject to grasp--the selenides, and I have spent countless hours trying to better understand. I apologize up front for all the technical jargon, much more than I try to incorporate into the Pick & Pack. With the selenides, I moved out of my comfort zone. Every time I get out of that zone, regardless of whether I win or fail, I learn something new, and that is a personal enjoyment. Some people tend to think that after a certain age, they are no longer allowed to start something new, and perhaps something scary. The truth is, not branching out is just an excuse to stay in the comfort zone. If I had stayed in the zone, I would have never learned about oxygen fugacity, fO_2 , and its relationship to the formation of minerals. However, I suspect that some rockhounds and readers of this newsletter might wish I had never ventured out of my zone. 😊

In this time of Covid-19, be brave, learn something new every day, get out of your comfort zone, read a book to relax, wear your mask, support local businesses, walk around the block while breathing deeply, check on your neighbors (especially the elderly), contribute to the local food bank, and make certain to keep current with the vaccinations. I hope you enjoyed the Holiday Season, and I wish for a new, and better, and safer New Year. Stay well.

As human beings, our job in life is to help people realize how rare and valuable each one of us really is, that each of us has something that no one else has or ever will have, something inside that is unique to all time. -Mr. Rogers

And now, ON TO THE SELENIDES.

Jöns Jakob Berzelius (1779-1848) was described by Wilson (1994) as one of the greatest mineral chemists who ever lived. That is quite a statement! Berzelius was born in Väversunda Sörgård, Sweden, a product of three generations of clergy on each side of the family. Now, I presume that father, grandfathers, and great grandfathers all expected a great theological future for Jöns. Surprise! His grades in theology were not so hot but he excelled in the natural sciences. So, he entered the great University at Uppsala and confused the faculty. Seems he was considered gifted but undisciplined (I was probably considered average and undisciplined). But all was not lost since he was very good in inorganic chemistry and mineralogy, and as an adult became *one of the greatest mineral chemists who ever lived*. He received that accolade, since MinDat.org noted that Berzelius was the father of analytical chemistry, inventor of



Above: Jöns Jacob Berzelius, 1779 - 1848.
Public domain photo.

chemical symbol notation, and discoverer of selenium (Se), cerium (Ce), silicon (Si), thorium (Th), titanium (Ti), and zirconium (Zr), in addition to other elements that he assigned to his students for their personal work. These discoveries certainly would qualify him as *the greatest*, but my guess is that students do not learn these facts in modern mineralogy courses (I certainly did not)!

One of the first elements described by Berzelius was selenium, Atomic Number 34 on the Periodic Chart of Elements, collected from copper deposits in the mines near Falun, Sweden. It was named after the Moon goddess Selene due to its similarity to the recently discovered tellurium (named for the Earth). Selenium is a metalloid with properties intermediate between a metal and nonmetals. For comparison, other metalloids include silicon, boron, antimony, arsenic, tellurium, and several others. Selenium is a rare element and its abundance in the earth's crust ranks the element 67th (0.05 ppm) while #1 oxygen has 461,000 ppm. Native selenium is rare as a mineral but does appear in some uranium-vanadium sandstone deposits. If selenium is available in hydrothermal or magmatic solutions it often substitutes for some sulfur in the formation sulfide minerals.

Commercially, selenium almost entirely (>80%) is obtained as a byproduct of copper refining (Brown, 2002). A smaller amount comes from the refining of gold, silver, zinc, and lead, where high concentrations of selenium allow for profitable operations. No ore deposits are mined for selenium alone. Although Germany and Japan are the leading producers of selenium, the raw products

come from Africa, Asia, Australia, and South America (Bleiwas, 2010). The U.S. has about 8% of the world's reserve, mostly tied up in copper resources in Nevada, Utah, New Mexico, and Arizona (Brininstool, 2015). Selenium is used in the manufacturing of glass and electronics, and in some color pigments.

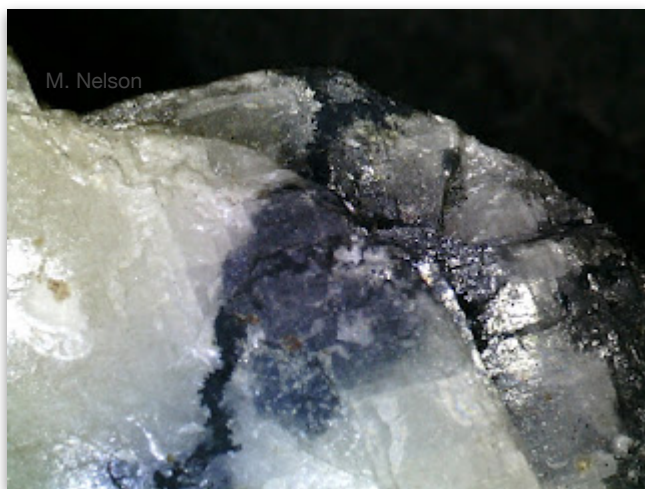
I do not have a specimen of native selenium but have acquired thumbnails of clausthalite [PbSe], klockmannite [CuSe] and berzelianite [Cu₂Se]; all are fairly rare minerals and in the selenide group. Selenium can exist in the oxidation states of 2-, 2+, 4+, and 6+ and form selenates, selenides, and selenites; all are anions with a negative oxidation state. In selenide compounds the selenium has an oxidation charge of 2-; the group includes ~24+ naturally occurring selenium minerals (I think, and they are rare since most selenium tends to substitute for sulfur in the sulfide minerals). Selenites (not the gypsum variety) contain the SeO₃ (oxidation state of 2-) radical (Se IV) while selenates contain SeO₄ (Se VI), have an oxidation state of 2-; both of these latter groups are quite soluble in water and Charykova and Krivovichev (2017) list about 28 rare minerals. Once selenium becomes aqueous it can be taken up by organisms. Selenates prefer well-aerated waters while selenites are more common in slow-moving waters such as lakes (Stillings, 2017). There are a plethora of synthesized selenium compounds and solutions in the laboratory.

Berzelianite, a copper selenide, is rare in the mineral record and was first described from the Skrikerum Mine located in south central Sweden; a mine "famous" for producing rare selenides. Besides berzelianite, the Mine is

the Type Locality of three other rare copper-silver selenides: crookesite, eucairite, and selenojalpaite.



Above: Black grains of fine grained berzelianite disseminated in calcite. From the Skrikerum Mine in Sweden. Width photo FOV ~ 5.7 cm. *Photo: M. Nelson*



Above: Photomicrographs of disseminated berzelianite (and perhaps other selenides) in calcite. From Skrikerum specimen. Width FOV ~1.7 cm. *Photo: M. Nelson*

The minerals are found in fracture-fillings hosted by vein calcite associated with

hydrothermal alteration. Copper was first mined ~1779 and some exploration and mining, mostly for selenium, continued until the end of the 1800s.

Berzelianite is a soft (~2.0 - 2.5 Mohs) metal with a metallic luster, a lead-gray to blue-gray to black color (but shiny when fresh), an irregular fracture, and is opaque. It occurs as microcrystals disseminated in a carbonate matrix (calcite at the Type Locality). At times berzelianite [Cu₂Se] is incorporated within the calcareous matrix and is difficult to distinguish from other selenides at Skrikerum, especially klockmannite [CuSe]. The massive form of both minerals seems indistinguishable to a soft rocker like me; therefore, I am relying on previous identifications and published descriptions.

SELENIUM

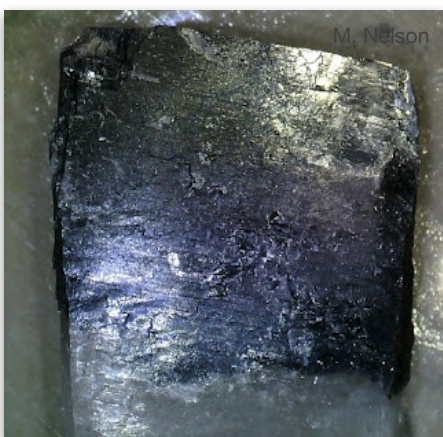
Toxic selenides

A soluble klockmannite

Don't drink the water

Klockmannite has a molecular weight of 44.59 % copper and 55.41% selenium (Webmineral.com) while berzelianite weighs in at 61.68 % copper and 38.32 % selenium. Klockmannite belongs to the hexagonal Crystal System while berzelianite is Isometric; however, in massive minerals there is little chance of observing mineral shape under a scope. Both are grayish black to dark gray in color, opaque, and soft at ~2.0+ (Mohs). Both have a sort of dull metallic luster and are associated with calcite. So, I am just taking my chances, especially since I do not have a reflected light microscope and polished sections.

Continued ...



Above: Blackish blue klockmannite "encased" in calcite. Width of specimen ~9 mm. Skrikerum Mine, Sweden. Photo: M. Nelson



Above: Photomicrograph of boundary of klockmannite and calcite (specimen above). Photo: M. Nelson

Clausthalite is a lead selenide (PbSe) related to galena, the lead sulfide (PbS). In fact, Förster (2005) has documented a solid solution series between the two minerals. Clausthalite forms in low-sulfur hydrothermal deposits and may be the most common selenide. In many ways it looks like galena with a lead-gray color, a grayish black streak, and a metallic luster. It is soft (~2.5 Mohs), brittle and often granular but at times forms nice euhedral crystal (Isometric Crystal System). One of my specimens came from

the famous Tilkeroode Mining District, Mansfeld, Mansfeld-Südharz, Saxony-Anhalt, Germany (part of the Bohemian Massif, see below). Here selenide minerals (including 3 Types) occur in veins with carbonate minerals, gold, hematite, platinum group minerals, and rare sulfides. Mining hematite for iron occurred in the 1700s and 1800s (Stillings, 2017). Simon and others (1997) studied the "why" of selenides forming from solutions rather than the simpler incorporation of selenium directly into sulfide minerals replacing some sulfur. They believed that high $f\text{O}_2$ (oxygen fugacity: the pressure of oxygen that is available to react with other components) values helped separate selenium from sulfur and prevented incorporation into the sulfides! If I understand any small thing about mineral/ore deposits, and that is a real stretch, above the groundwater line there is a high $f\text{O}_2$ and oxide minerals form. Below the water line there is a high sulfur fugacity ($s\text{O}_2$) and sulfide minerals form. Don't take that to the bank without checking.



Above: Clausthalite, Tilkeroode Mining District, Germany. Width FOV ~ 1.5 cm. Photo: M. Nelson

Continued ...



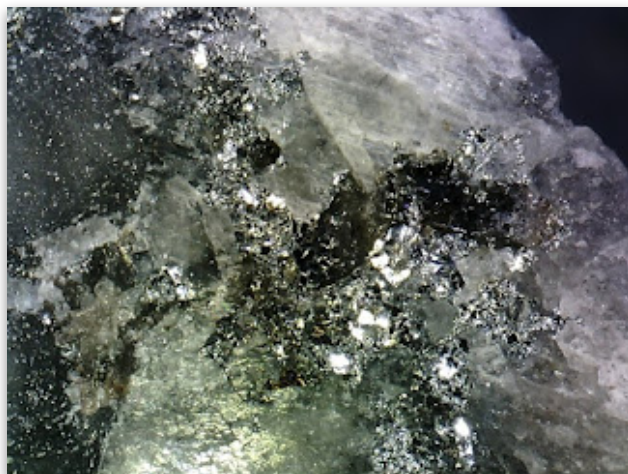
Above: Photomicrograph of Tilkerode specimen on previous page. *Photo: M. Nelson*

The second specimen of clausthalite I obtained is labeled as being collected from Petrovice, Russia—I believe this is incorrect. First, I could not locate mines in or near a Russian locality named Petrovice. In fact, not even a locality was noted. Second, there is a mining district in the Czech Republic named Petrovice, a major locality noted for the occurrence and collection of rare selenides, including petrovicite. The old mines are located in one of the uranium-vanadium-polymetallic mining districts in the Bohemian Massif (structurally controlled block of highlands). The Massif encompasses parts of the central Czech Republic, eastern Germany, southern Poland, and northern Austria. In the Czech Republic, the Massif has a core of plutonic granites surrounded by metasedimentary rocks of late Precambrian and early Cambrian age. Mineralization, as dated by the uranium, is Permian in age and is associated with the Variscan Orogeny (the mountain building event associated with the collision of Laurasia and Gondwana producing the Pangaea Supercontinent) (Škácha and others, 2017).

The selenide occurrences in the Bohemian Massif are amazing as the rocks have



Above: Clausthalite, Petrovice, Czech Republic. Width FOV ~1.0 cm. *Photo: M. Nelson*



Above: Photomicrograph of Petrovice specimen above. *Photo: M. Nelson*

produced at least 18 newly discovered species (since around 1970; and 5 more before that date). These selenides seem fascinating to me and minerals worth studying if I were a young student in a major research institution!!! These selenides...are characterized using wavelength-dispersive spectroscopy, reflected light, powder X-ray diffraction, single crystal X-ray diffraction, Raman spectroscopy, and electron backscatter diffraction (Škácha and others, 2017). As I said, if I were a bright young student well versed in electronic gizmos!!!! Now I am just an ole rockhound trying to have fun and do my best with some pretty

complex, and hard to identify, minerals.

Lifelong learning is a form of self-initiated education that is focused on personal development. While there is no standardized definition of lifelong learning, it has generally been taken to refer to the learning that occurs outside of a formal educational institute...Lifelong learning ...is best described as being voluntary with the purpose of achieving personal fulfillment. (valamis.com)

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Classifieds and Announcements



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.

e-mail to the editor:

csmseditor@hotmail.com Mail to:
Pick & Pack Editor PO Box 2
Colorado Springs, CO 80901

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Mark Your Calendar: Field Trip with Marge Regel

Contact: marjory.regel@yahoo.com
719-650-8148

UTAH (May 21-26) 5 different areas and if you find something and want to stay there you can by notifying leader. You could spend a week at any area as they are large.

1 day: Grand Junction for barite

2 days: Yellow Cat for agate, red-wood, and barite pseudomorphs, black/white wood, anything else you might find

2 days: San-Rafael swell or reef Celestine, grape agate

1 day: Crystal Geyser (6 miles out of Green River) travertine, "buttons" precipitated out of the overflow geyser goes off 2-3 days- not predictable (may go 4-5 miles further to look for more barite pseudomorphs as there is the Morrison formation that way. I only scouted it once as was told it was there also and found a few as it was late and fellow that lives a mile from the geyser told me about it but I was limited on time. There is a state park in Green River.

Instructions

All trips meet at 7:45 AM. Please be ready to leave at 8 AM, as we have to drive to get to locations. However I will be staying in Green River Motel (22nd to 26th), so if dry camping you won't have to be in Green River (the 22nd 23d)

May 21: Meet at Super 8 Motel parking lot in Grand Junction (Exit Horizon Dr. off I-70 on south side of I-70). A gas station and Green Pastures restaurant are across from Super 8 Motel.

May 22 and 23: Meet at Exit 193 about 70-75 miles West of Grand Junction off I-70. Large parking space and then it turns into a dirt road. Yellow/Cat-Cisco exit; We will be on south side of I-70 for a prep meeting.

May 24 and 25: Meet in Green River West exit (4 miles west of East exit to G.R.). From there we will go to San Rafael Swell area. Dry camp in area for camping or there's a state campground in middle of G.R. which you can pay and stay but make reservations as I'm told it's busy. 2nd day in area will be flexible. I will be in G.R. both days and meet at the gas station West exit as day before. We may go N. or S. as there's miles to explore.

May 26: Meet at East exit to G.R. at Motel 8 parking area near a fast food place. These exits are a ways off I-70 maybe 1/2 mile or so. It's been awhile since I've been there.

To sign up, contact: marjory.regel@yahoo.com 719-650-8148

Classifieds and Announcements

From the editor: Upper Gold Camp Road Parking Lot



Rockhounds, these rocks and boulders were found strewn about as shown, in the upper Gold Camp Road parking lot, mid-February 2022. They apparently fell down the slope after a heavy rain/snowfall. When parking in this lot, be sure to park as far away from the slope as possible. Also, plan for the possibility of this lot being closed for remediation. The big boulder shown on the left is almost halfway across the lot.

Eldon Hunewell Memorial Announcement

Dear Friends of Eldon Hunewell,

There will be a Remembrance gathering for Eldon on Saturday, April 2, at 1 PM at Wheat Ridge United Methodist Church, 7530 W 38th Ave, Wheat Ridge, CO. Eldon would have been 79 years young on this day, so we thought it would appropriate to celebrate his life on his day of birth. This will be a simple gathering of friends to share stories about their time with Eldon, special memories, and hopefully a gentle laugh or two, as Eldon loved a good chuckle. For those of you who wish to write down a story to share with Eldon's family, that would be greatly appreciated, as no family members will be attending this gathering. The family will be burying Eldon's ashes in Oklahoma, next to his deceased family members, the end of April. Feel free to forward stories to be shared to lori.baer@gmail.com. Someone else will read them if you are not comfortable doing so. Also, there will be light refreshments served. Anyone wanting to help with refreshments, please contact Lori. The gathering will be in the church gym; enter from the parking lot, located behind the church on the south side.

We will be asking for a minimal donation to help cover the cost of this gathering, including a donation to the church, refreshments, a hearing impaired interpreter, etc. All monies left over will be given to one of Eldon's favorite charities, probably the Wild Animal Sanctuary, or a cat rescue facility. Any contribution is very much appreciated.





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. 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), free admission to the *Western Museum of Mining & Industry* (carry your card), 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
- Rocky Mountain Federation of Mineralogical Societies (RMFMS) www.rmfmms.org