

THE BULLETIN OF THE COLORADO SPRINGS MINERALOGICAL SOCIETY Published Since 1960

Colorado Springs
Mineralogical Society
Founded in 1936
Lazard Cahn
Honorary President
November 2019
PICK & PACK
Vol 59 Number 9

CSMS General Assembly

Thursday, November 21, 7:00 PM

Speaker: Mike Nelson

Topic: "EXPLORING COLORADO GEOLOGY"

Please note: Members whose names begin with M-Z are responsible for refreshments in November

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

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NOVEMBER PROGRAM

Mike Nelson (**left**) has authored the Colorado Springs Mineralogical Society's Geology Blog as "The Rock Guy" for 8+ years and counting! His most recent blog entry on [VANADIUM MINERALS: LASALITE AND CORVUSITE](https://csmsggeologypost.blogspot.com/) can be found here:

<https://csmsggeologypost.blogspot.com/>

Mike has submitted numerous articles to the Pick & Pack over the years and has no doubt greatly expanded the understanding of minerals that can be found in Colorado. Thank you for your continued and dedicated contributions to the newsletter!

COLORADO SPRINGS MINERALOGICAL SOCIETY PO BOX 2 COLORADO SPRINGS, COLORADO 80901-0002

November & December 2019

Appointment Only ----- **Lapidary Group** Sharon Holte, 719 217-5683

2020

CSMS

Adult Rock Hound of the Year

Name: _____

Tell about your nominee: _____

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Signed: _____

2020

CSMS

Junior Rock Hound of the Year

Name: _____

Tell about your nominee: _____

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Signed: _____

The Colorado Springs Mineralogical Society (CSMS) will elect the 2020 Board at the November 21, General Assembly Meeting. We have SIX open positions this year: President, Vice President, Secretary, Editor, and two Members-at-Large. ALL Board positions are open for nominations (you must have served as a past Board member to run for the President position.) A description of duties by position are listed below.

If you would like to run for the CSMS Board of Directors, please contact Lisa Kinder, our Nominating Committee Chairman, or any current Board member. Lisa can be reached at:

lisavkinder@comcast.net or 719-351-4018.

DUTIES OF THE BOARD OF DIRECTORS

1. The duties of the **PRESIDENT** are:

- President shall preside at Society meetings; supervise the activities of the Society; Attend Board of Directors meetings,
- Attend and preside over General Assembly Meetings,
- Appoint committees,
- Delegate authority, when and where the chair deems it necessary,
- Discuss and understand the governing documents when a new Board member(s) joins the Board,
- Maintain and disseminate the Calendar of Deadlines,
- Make certain the Board of Directors Deadlines spreadsheet,
- Make certain the Board of Directors have a current copy of the Constitution, By-Laws, Resolutions, and are read and understood by the third Board meeting,
- Read and understand the governing documents by the second Board meeting,
- Supervise the activities of the Society.

2. The duties of the **VICE PRESIDENT** are:

- Attend Board of Directors meetings, and serve as chairman, conducting Board meetings,
- Attend General Assembly Meetings,

- Act as chairman of the Board of Directors and assist in supervision of the active committees,
- Assist the President in the supervision of the active committees,
- Assume duties of the president when president is absent or that office is vacant,
- Be responsible for recording the Board Meeting and the General Assembly Meeting,
- Provide programs for the general assembly meetings.

3. The duties of the **SECRETARY** are:

- Attend Board of Directors meetings and keeping minutes,
- Attend General assembly meetings and keeping minutes,
- Ensure that updates are made to the Society Constitution and By-Laws when Resolutions and/or Revisions are duly authorized by the membership,
- Have name plates and position plates created for officer installation in January,
- Preserve all records necessary to conduct the business of the Society
- Receive, read and answer society communications,
- Submit to the Pike Peak Library: Penrose Library: Historical Department, for the purpose of maintaining the society's history as stated in the Constitution.

4. The duties of the **TREASURER** are:

- Attend Board of Directors meetings,
- Attend General Assembly meetings,
- Keep accurate records of receipts and expenditures,
- Participate in audits of the society in accordance with the bylaws,
- Pay the bills of the society,
- Receive and safeguard all society funds,
- Shall be responsible for recurrent expenses approved by the Society or Board of Directors (such as rent, postage, insurance, newsletter printing, etc.),

5. Duties of **MEMBERSHIP SECRETARY** are:

- Attend Board of Directors meetings,
- Attend General Assembly meetings,
- Create a yearly membership directory,

- Creation of mailing labels for bulletins and notices,
- Issuance of dues receipts,
- Issuance of membership cards,
- Maintain membership spreadsheet, distribution to Board members and to satellite chairs,
- Provide the Treasurer with the information for presenting pins,
- Provide the Treasurer with the information needed to pay our dues to RMFS,
- Reporting on the membership for the Board and General Assembly meetings,
- The creation of or updating membership applications, (yearly).

6. The duties of the **EDITOR(S)** are:

- Attend Board of Directors meetings,
- Attend General Assembly meetings,
- Publishing the Societies bulletin – the Pick & Pack, in electronic format, 10 times a year: to contain the next General Assembly Meeting, time, place and program, to provide to the webmaster, for publication on www.CSMS1936.com and to the Rocky Mountain Federation of Mineralogical Societies (RMFMS), to email to the membership, to mail to those who do not have an email address, (have printed, (Office Depot), pick up, fold, add mailing stickers, add postage, and drop off at post office,
- To provide regional and/or national rockhound communities those articles deemed by the Editor to be of interest,
- Shall submit Society members' nominations to RMFMS for those articles written and published in the Pick & Pack for consideration in designated categories as listed on RMFMS website for the bulletin writing awards contest,
- Shall be instrumental in the appointment of a Rock Hound of the Year award,
- Shall make certain there is an appointment of a Junior Rock Hound of the Year award.
- To provide Blast-O-Grams to the membership to keep the membership up-to-date on the societies doings.

7. The duties of the **MEMBERS-AT-LARGE** are:

- Attend Board of Directors meetings,
- Attend General Assembly meetings,

- Act as a member liaison, especially to new members,
- Maintain and hand out tri-fold brochures,
- Maintain and hand out welcome letter to new members,
- Undertake projects at the request of the president.

8. Duties of **IMMEDIATE PAST PRESIDENT** are:

- Attend Board of Directors meetings,
- Attend General Assembly meetings,
- Act as a resource to the Board of Directors as to how certain situation were evaluated and handled, or research the situation,
- Act as a resource to the Board of Directors as to the history of any events,
- Bring continuity to the Board of Directors in the decision they may make.

The Board has recently decided to make some amendments to the constitution; effective in 2020—please read the following:

1- Amendment to article X - Annual Picnic.

“The annual picnic will be held on a Saturday in August”. The reason for the change is that people tend to be away in July

2 - Amendment to article IX p 5- Annual Show.

“Vendors will be charged booth fees based on the size of the booths and the cost of the venue. The fees will be determined by the Show Chairman.” The change will allow the Show Chairman to determine the fees without each time having to change the constitution.

Further information and email reminders will be sent as we get closer to these events—they will be here before you know it!

PEBBLE PUPS CORNER



CSMS Pebble Pups & Earth Science Scholars

The Earth Science Scholars & Pebble Pups meet at the Mt. Carmel Veterans Center every THIRD Thursday at 5:30 PM until 6:15 PM or so. We only meet during the academic year, and we include January. So, it is Sept through May.

Special announcements and field trips are noted on our blog:

<http://pebblepups.blogspot.com>

and through the CSMS website: <http://www.csms1936.com>

The Cresson Mine: The Untold Stories

By Benjamin Hayden Elick and Steven Wade Veatch

The Cresson mine (figure1)—situated between Cripple Creek and Victor, Colorado—was established in 1894 (MacKell, 2003). No one is certain who started the mine, but records show that two brothers, insurance agents J.R. and Eugene Harbeck from Chicago, were early owners. After a hard night of drinking, they sobered up the next day and learned of their new acquisition (MacKell, 2003). The Cresson Mining and Milling Company was organized a year later, in 1895, to raise capital and operate the mine (Patton and Wolf, 1915). The mine continued operating through several leases with low but steady proceeds.



Figure 1. Early view of the Cresson mine, Cripple Creek, Colorado. Photograph date circa 1914, courtesy of the Cripple Creek District Museum.

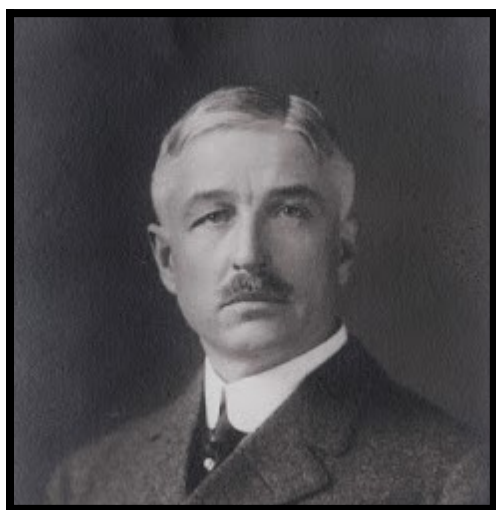


Figure 2. Richard Roelofs, manager of the Cresson mine. Photograph date 1914, courtesy of the Cripple Creek District Museum.

The Cresson mine became profitable when Richard Roelofs, a known mining innovator, was hired by the Harbecks as mine manager in 1895. Roelofs wrote on an undated letterhead: "I was a prospector, a leaser, a miner, an assayer and chemist, an underground shift boss, foreman, superintendent and then general manager of one to the greatest of Colorado's mines" (Roelofs, n.d.).

Roelofs (figure 2) was a newcomer to Colorado, as many were when the Cripple Creek gold rush ignited in 1891. He moved to Cripple Creek in 1893 with his wife Mabel. They had one child, Richard Jr., who was born on August 19, 1894 in Cripple Creek.

Roelofs introduced new technology and mining techniques at the Cresson mine, including an aerial tramway he designed that transported ore to a railway at the bottom of the large hill on which the Cresson sat. The tramway reduced the costs of transporting ore (Sprague, 1953). Roelofs deepened the shaft and enlarged the mined-out voids, or stopes. The

(CONTINUED ON PAGE 7)

Not only did Roelofs have to manage the Cresson mine, he had to raise his son alone. Shortly after the birth of Richard Jr., Mabel left her husband and went to Philadelphia, taking their infant son with her. She left Cripple Creek to pursue riches. Then, in July 1895, police arrested Mabel Roelofs for passing bad checks (Keels, 2018). Richard Jr. was sent back to Cripple Creek to join his father. Mabel Roelofs later fled to New York, where she continued a life of crime working con after con.

As authorities began to close in, she committed suicide by poisoning in 1908 (Keels, 2018). Richard Roelofs, in his employment contract, earned a percentage of the Cresson mine's profits, making him a very rich man. If Mabel Roelofs had stayed with Richard, she would have shared in his fabulous wealth.

Miners discovered the famous Cresson vug by accident on November 25, 1914 (Smith Jr., Feitz, and Raines, 1985). While following large ore shoots on the 12th level, miners broke into the large chamber, or "vug," which was in the shape of a pear (Patton and Wolf, 1915). The vug was approximately 12 m tall, 7 m long, and 4 m wide. The walls were lined with delicate, sparkling crystals of gold tellurides; however, many had fallen to the floor—disturbed by nearby blasting (Jensen, 2003).

The ore minerals in the vug were mostly the gold tellurides sylvanite and calaverite. Sylvanite is comprised of gold, silver, and tellurium, while calaverite contains only gold and tellurium. The tellurides within the Cresson vug occurred as crystals, varying in length from 1 to 3 mm. On some crystals of calaverite, pure gold was found, suggesting chemical alteration (Patton and Wolf, 1915). These ore minerals penetrated beyond the surface of the vug into the surrounding rock to depths of up to 1.5 m (Mehls and Mehls, 2001).

The gold camp was soon buzzing with conversation about the vug, and word of the discovery spread across the nation. National newspapers said the vug "staggeres the imagination," and another paper declared it "the most important strike ever made in the Cripple Creek District" (Various period newspapers: Cripple Creek District Museum, n.d.). This astonishing discovery supported Cripple Creek's claim that it was the "World's Greatest Gold Camp."

The vug, and a considerable amount of Cresson ore, was a part of the Cresson pipe, or blowout. The Cresson pipe is an elliptical cylinder of lamprophyric material (mafic rocks) 100 to 150 m in diameter (Jensen, 2003). The lamprophyric matrix graded into a lighter colored carbonate matrix (Jensen, 2003). The entire blowout is encased inside a diatreme, a carrot-shaped volcanic complex, emplaced in the Oligocene (~ 30 Ma) that reached deep into the crust (Jensen, 2003). The perimeter of the pipe produced

2,000,000 ounces of gold, indicating major deposits of gold-bearing solutions along the contact between the Cresson pipe and the diatreme (Jensen, 2003). The gold ore from the vug was so valuable that Roelofs quickly took measures to prevent theft or high grading. He ordered a storehouse built underground (on the same level as the Cresson vug) into an old drift and secured it with solid steel doors. Bags of gold ore were stacked by hand and securely locked inside. A newspaper article described the magnitude of ore as "they had stacked between 80 to 100 tons of the phenomenally rich ore at the time of my visit, and from all indications, will continue stacking this ore for some time" (Various period newspapers: Cripple Creek District Museum, n.d.). At times, up to \$500,000 (1914 value, or \$36,250,000 in today's dollars) worth of gold ore was stored there.

The Cresson vug's valuable gold ore also needed special handling. Roelofs hired guards to protect the vug and ore. The guards watched over the ore on every part of its journey through mining, transportation, and processing—keeping it safe from thieves. Two to three armed guards worked each shift underground, providing constant protection to the ore and vug. To prevent high grading, Roelofs allowed only two of the most trusted and senior miners to work the vug at a time, and always under close supervision.

The Cresson mine took precautions to secure the ore while it traveled on the railways to smelters. These measures included locked box cars and guards carrying sawed-off shotguns and rifles, who rode inside and on the top of the cars (Newton, 1928). Accounts claim that gold ore was scraped off the vug's walls and then shoveled into large canvas bags (figure 3). It took four weeks to mine the vug out (Cunningham, 2000).



Figure 3. Canvas bags of gold ore from the Cresson vug are brought to the surface. Photograph date 1914, courtesy of the Cripple Creek District Museum.

There were two main grades of ore from the Cresson vug: the first grade included ore worth over \$5,000 (1914 dollars) per ton and the second grade from \$1,000 to \$1,500 (1914 dollars) per ton ("\$10,000,000 Strike in Cresson Mine Proves Again that Colorado is the Paradise

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ON THE TRAIL OF PUCHERITE AND SERPENTINE WITH LAZARD CAHN



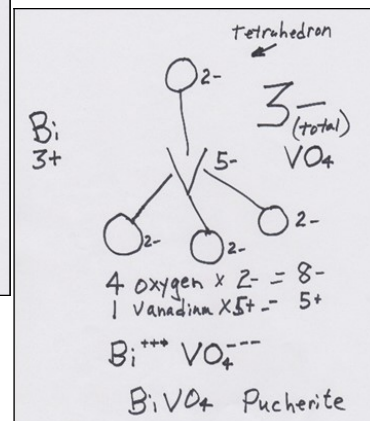
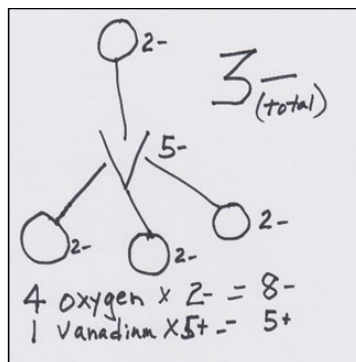
By Mike Nelson

CSMS csrockguy@yahoo.com

It is always nice to locate minerals that are associated with Lazard Cahn, the Honorary President of the Colorado Springs Mineralogical Society (CSMS). The Society can trace its origin to November 1936 when 13 individuals met for the purpose of organizing a local mineralogical society. Lazard Cahn was elected as the Permanent Honorary President; hence, the designation of such on all CSMS publications continuing into the 21st century. I note with interest that at the initial meeting the new members spent their time examining micro-mounts under binocular microscopes. Evidently the new society was the outgrowth of interest by persons studying microscopic crystals (AKA micromounts) under the instruction of Mr. Cahn (twice per week at his office). The Society was active early on and by 1939 mineral displays were exhibited throughout Colorado Springs by the Chamber of Commerce. So, when mineral dealer and CSMS member Austin Cockell offered me the two mineral specimens complete with Cahn labels, I was only too happy to snap them up.

In addition to being a Cahn specimen, pucherite a bismuth vanadate $[\text{Bi}(\text{VO}_4)]$, belongs to the vanadate class of minerals that are related to the arsenates and phosphates. These vanadates contain the element vanadium (with a +5 charge) plus the element oxygen (with a -2 charge) arranged in in a tetrahedron where four oxygen atoms (total of -8) are at the corners and surround the central vanadium atom. Each of these tetrahedra (BELOW LEFT) then has a charge of -3.

dium (with a +5 charge) plus the element oxygen (with a -2 charge) arranged in in a tetrahedron where four oxygen atoms (total of -8) are at the corners and surround the central vanadium atom. Each of these tetrahedra (BELOW LEFT) then has a charge of -3.



In pucherite, the positively charged bismuth (+3, ABOVE RIGHT) is outside of the tetrahedron and neutralizes the vanadate ion.



ABOVE: Pucherite crystals, individual faces measure <1mm across. FOV ~1cm wide.

The phosphates $[\text{PO}_4 - - -]$ and the arsenates $[\text{AsO}_4 - - -]$ ions are of similar size, have the same minus 3 charge, and often replace and substitute for each other. Of the three groups, the vanadates are by far the rarest

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with only carnotite [hydrated potassium uranyl vanadate, $K_2(UO_2)_2(VO_4)_2 \cdot 3H_2O$]; and vanadinite [lead chlorite vanadate, $Pb_5(VO_4)_3Cl$] being recognizable and somewhat common minerals.



ABOVE: Pucherite [$Bi(VO_4)$], FOV 1.1cm

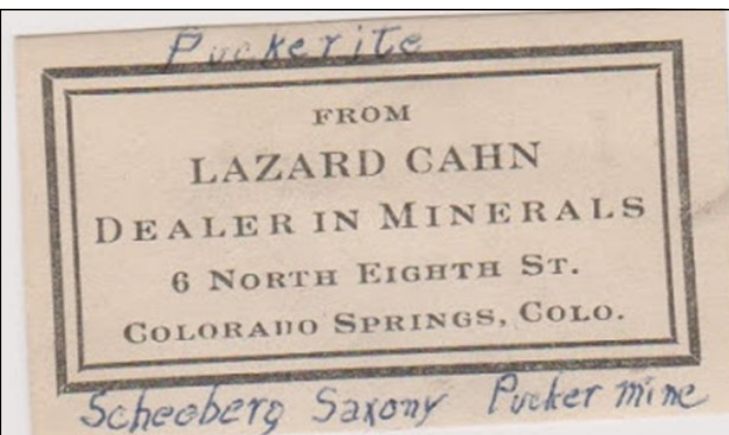
At first glance pucherite may “look like” it’s more common relative vanadinite. My specimen has the same reddish brown to yellowish brown color; however, the well-defined crystals with sharp angles do not have the hexagonal barrel shape of vanadinite but are tabular to equant and sometimes prismatic. They have a vitreous to adamantine luster, are fairly soft with a hardness of ~4 (Mohs), a distinctive yellow streak, a conchoidal fracture and are transparent to translucent.

BELOW: Pucherite specimen purchased by the author, FOV ~5mm wide



Cahn’s label describes the collecting locality as “Scheeberg Saxony Pucker mine.” Today we know the mineral was named for, and collected at, the Pucher Shaft, Wolfgang Maaßen Mine field, Schneeberg, Erzgebirgskreis, Saxony, Germany. MinDat.org noted the area is a polymetallic deposit (Ag-Bi-Co-Ni-U-bearing veins), was worked for silver and bismuth since the 15th century, later for cobalt and, in the 20th century, for uranium. Most of the veins are hydrothermally formed.

The rocks in the field are early Paleozoic and late Precambrian metamorphosed igneous and sedimentary rocks that were intruded by late Paleozoic granitic rocks. All of this tectonic activity was a geologic mountain-building event caused by the collision of Gondwana and Eurasia to help form the supercontinent of Pangaea. As for pucherite, it is a rare alteration product of other bismuth minerals in the oxidized zone of hydrothermal ore deposits (MinDat.org). Pucherite (Orthorhombic Crystal System) is also trimorphous (same chemistry but different crystal structure) with clinobisvanite (Monoclinic Crystal System) and dreyerite (Tetragonal Crystal System).



A second Cahn specimen is labeled “Serpentine Big Timber Mont.” This rock was a little more difficult to pluck out information since 1) serpentine is not actually a true individual mineral; and 2) I could not find any “serpentine mineral” located/collected/mined from near Big Timber. But I will go with what I have. The Dictionary of Geology (2019) describes serpentine as a “family of silicate minerals rich in magnesium and water, derived from low-temperature alteration or metamorphism of the minerals in ultramafic rocks. Rocks made up of serpentine minerals

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2019 CSMS OFFICE

Sharon Holte, President

John Massie, Vice-President

OPEN, Secretary

Ann Proctor, Treasurer

Adelaide Bahr, Membership Secretary

Taylor Harper, Editor

Laurann Briding, Member-at-Large

OPEN, Member-at-Large

Ernie Hanlon, Past President

2019 CSMS CHAIRPERSONS

John Massie, Program Coordinator

John Massie, Show Volunteer Coordinator

Mike Webb, Field Trip Coordinator

Steven Veatch, Science Fair Chair

Frank & Ellie Rosenberg, Librarians

Mark Schultz, Social Committee Chair

Ann Proctor, Store Keeper

Lisa Kinder, Show Chairman

Lisa Kinder, Webmaster

Lisa Kinder, Facebook Keeper

Mike Nelson, Federation Representative

TBD, Federation Representative

SECRETARY'S SPOT by Adelaide Bahr

General Meeting Minutes for the
Colorado Springs Mineralogical
Society - 10/17/2019

CSMS General Assembly Meeting Minutes:

CSMS General Assembly Meeting Agenda

Thursday October 17, 2019 7:00pm

Mt. Carmel Veterans Service Center

530 Communications Circle Colorado Springs, CO 80905

Sharon Holte called the meeting to order, at 7:00 p.m., John Massey directed the Pledge of Allegiance, Introduction of guests by John Massey; Bert Davison and son were visiting from Utah. Introduction of new members by Adelaide Bahr, Membership Secretary; no new members. Introduction of Program, by John Massie; Steve Veatch and Ben Elick spoke about "The Cresson Mine: The Untold Stories". The members asked many questions. Break for 20 minutes: drinks, cookies and goodies. There were about 45 members at this meeting, 5 minerals were given out: Oscar Price offered free pyrite nuggets from the Portland Mine

Officer's Reports

President – Sharon Holte

Calendar of Deadlines - 1) Sharon has an appointment with the Penrose librarian so she can deposit CSMS materials in the library. 2) Ann the treasurer is still working on the audits. 2) Lisa Kinder has offered to head the Nomination Committee. The open positions are: President, Vice President, Secretary, Editor and two members at large.

Awards: Sharon passed out certificates to people who won awards at the June Show: to Kevin Witte for his Colorado Self collected case, to Roger Pittman for his Colorado Mineral Display, and to Josh Hair for his Poebrotherium display. Other certificates went to Steve Veatch and Mike Nelson for Adult Poetry and Adult Articles.

Vice-President – John Massie

Speakers: Nov 21, Mike Nelson; Dec 19, Christmas Party—no speaker

John requested a change in the Constitution so that the Picnic can be held in August rather than July. The Membership was favorable to the change but suggested open ended wording such as "the Picnic will be held in the Summer".

Treasurer - Ann Proctor was not present,

Secretary - Sarah Shilling was not present,

Membership Secretary – Adelaide Bahr had nothing to report,

Editor – Taylor Harper was absent,

Member at Large – Laurann Briding was absent,

Member at Large – Bill Arnson announced that he will be moving to Missouri

Past President – Ernie Hanlon was absent

Website Coordinator – Lisa Kinder has updated the site with all meetings until 2021,

Nominating Committee – Lisa Kinder asked for nominations and urged people to volunteer.

Satellite Groups

Crystal Group – Kevin Witte - Mike Nelson will present,

Faceting Group – John Massie - By appointment,

Pebble Pups – Steven Veatch -The P&P had a display for National Fossil Day at the Western Mining Museum; Ben Elick is speaking at the Visitor Center at Garden of the Gods, and will present a paper at the New Mexico Geology meetings,

Fossil Group – Jerry Suchan - The meeting topic is Devonian Vertebrates.

Jewelry Group – Bill Arnson - has moved out of the area. The group needs a new leader.

Lapidary Group – Sharon Holte - appointment only please call Sunday evening after 6:30

Field Trip Leader – Mike Webb / Sharon Holte, August 21, 2020 is taken by the Picnic,

Liaisons

Claims – Kevin Witte - we are caught up with annual payments and paperwork; Kevin was at the Rocky Mountain High claims and saw many open holes, he reminded the membership to always fill the holes after they dig.

Social Coordinator – Mark Schultz - thanked the people who brought food,

Store Keeper – Ann Proctor was absent,

Unfinished Business: there was none

New Business

Mineral Donation – Sharon announced that a collection of minerals was donated to CSMS by Daniel and Diana Beneteau, who are non-members. The collector, Lawrence (Larry) Walker, assembled the minerals in Sacramento, California in the 1950s. The collection consists of 17 large cases and 3 boxes, accompanied by an inventory. The donors have received a letter of acknowledgment for tax purposes. The collection is in Sharon's garage. John Massie with the help of other members will compare the specimens to the inventory. The membership suggested that some of the specimens should be brought to each general meeting so that people can see them.

Sharon also announced the donation of a saw with a 25 inch blade. The saw is housed in Sharon's garage,

Gem Show - Lisa Kinder would like to reschedule the Gem Show for the second weekend in June in order to distance it from the Labor Day weekend. The Fairplay Show has been moved, so there is no conflict. No objections were raised,

Meeting Adjourned by our President, Sharon Holte at 8:45 pm.

2019 SATELLITE GROUP CHAIRPERSONS

Crystal, Kevin Witte/Bob Germano

Faceting, John Massie/Bertha Medina

Fossil, Jerry Suchan/Joyce Price

Jewelry, OPEN

Lapidary, Sharon Holte

Pebble Pups, Steven Veatch/
Betty Marchant

2019 CSMS LIAISONS

Florissant Fossil Beds
National Monument, Steven Veatch

Western Museum of
Mining & Industry, Steven Veatch

are called serpentinite. Serpentine minerals are light to dark green, commonly varied in hue, and greasy looking; the mineral feels slippery.” There are about 20 varieties of serpentine that are hydrous magnesium iron phyllosilicate $[(\text{Mg}, \text{Fe})_3\text{Si}_2\text{O}_5(\text{OH})_4]$ minerals. Many of these minerals are similar to each other and often are very difficult to distinguish between without the use of electronic gizmos. Various serpentine minerals are mined for magnesium, for a variety of asbestos, and for decorative rock and carving stone (fake jade).



**Serpentine,
chrysotile? Big
Timber, Mon-
tana. Width of
specimen ~7.0
cm.**

My best estimate is that the Cahn specimen is a variety called chrysotile $[\text{Mg}(\text{Si}_2\text{O}_5)(\text{OH})_4]$, a serpentine type of asbestos. There are several asbestos minerals (composed of thin fibers) that are usually classified as either Amphibole Asbestos or Serpentine Asbestos. The latter includes chrysotile (low temperature) with white curly fibers while antigorite (high temperature) and lizardite (low temperature) have platy habits. The Cahn specimen has bands of the white curly fibers “emplaced” in a soft (~3 Mohs), very dark green (almost black) mineral with a greasy luster and feel. There are no visible crystals and the specimen has a massive habit with the white curly fibers emplaced in bands.



Photomicrograph of above specimen showing "stripes" (each 1 mm or less) of white “asbestos” fibers.

Serpentine minerals form by hydration and metamorphism of ultramafic rocks —those igneous and metamorphic rocks with high magnesium and iron content and low silica (such as peridotite, dunite, kimberlite, anorthosite and chromite) --in a process termed serpentinization. This action is usually associated with subduction zones along orogenic belts. But, I have not solved the location of the Big Timber locality info on the label.



Lazard Cahn was born in 1865 and died in 1940 in Colorado Springs. His rock and mineral dealership was located in New York City from 1897-~1910 and in his Colorado Springs home at 6 North 8th St. and office 510-512 Exchange National Bank Building from 1908 until his death.



Photo courtesy of Archives, Pikes Peak Library, Colorado Springs.

REFERENCES CITED

Dictionary of Geology, 2019, www.theodora.com/geology/glossarys

for the Gold Hunter," 1914, p. 5). The higher-grade ore had 250-plus ounces of gold per ton, while the second grade of ore had 75-plus ounces per ton, based on the 1914 gold price of \$20 per ounce (Historical Gold Prices, 2015). In all, a whopping 60,000 ounces of gold was recovered from the vug (Hunter, 2002). The total value of the vug's ore in 1914 gold prices was \$1,200,000 (Smith Jr., Feitz, and Raines, 1985). Based on today's gold values, the vug's rich ore would be worth over \$87,000,000.

The discovery of the Cresson vug prompted other mines in the district to deepen their shafts, since the vug was found on a deep level of the Cresson. Mine owners also expanded exploration in their mines.

Roelofs, at the age of fifty, sold out in 1917 and spent the next 30 years comfortably in New York while spending time abroad, mostly in Paris Richard. Died at the age of 82 in 1939 (Sprague 1953).

The Cresson mine was operated for 66 years, finally closing in 1961 (Munn, 1984). After finishing as one of the top producing mines in the district, its buildings were torn down and the head frame and its machinery were moved to a park in Victor. In the early 1990s, exploration geologists discovered a 2.5 million-ounce gold deposit in the same area as the historic Cresson mine, called the Cresson deposit. The Cripple Creek and Victor Gold Mining Company submitted permit applications in 1994 for open pit mining of the Cresson deposit and surrounding areas. Mining started in December 1994, and by the end of 1995, 76,500 ounces of gold were produced. The Cripple Creek and Victor Gold Mining Company is still mining the area today under the ownership of Newmont Goldcorp with headquarters in Greenwood Village, Colorado.

The original Cresson mine shaft is long gone, and in its place is the Cresson open pit at 518 m deep (Poulson, personal communication, 2019). Newmont will deepen the pit another 91 m for an ultimate depth of 609 m. At this point, a portal for underground exploration is planned at the bottom of the pit. This project is planned in two phases. In phase one, a decline drift is planned with 762 m of easterly exploratory drifting underneath the Cresson pit. The intent is to establish drill bays at the end of the drift for core drilling below the historic Orpha May and Vindicator mines. The estimated cost of this phase is \$26 million. Phase two includes 3,048 m of exploration drifting and positioning core drilling bays at an additional \$100 million cost. The goal is to prove the potential for underground mining projects. If Newmont Goldcorp's investment council approves this plan, the project would start as early as the first quarter of 2020 (Poulson, personal communication, 2019).

The Cresson mine took its place among the important mines in Cripple Creek as a result of its early establishment in the district, an innovative mine manager, expansive underground workings, and the discovery of the rich Cresson vug. Mining continues at the Cresson today.

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