



THE BULLETIN OF THE COLORADO SPRINGS MINERALOGICAL SOCIETY Published Since 1960

December 2011 PICK&PACK Volume 51 Number 09

CSMS is an incorporated nonprofit organization with these goals:

- To promote and disseminate knowledge of the earth sciences... 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 is published 10 times each year to assist and promote the above.

Proud Members of:

- American Federation of Mineralogical Societies (AFMS) www.amfed.org
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Colorado Springs Mineralogical Society

Founded in 1936

Lazard Cahn

Honorary President

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BLUE HIGHWAYS: PRECAMBRIAN ROCKS OF WYOMING

By Mike Nelson

csrockguy@yahoo.com; www.csmsgeologypost.blogspot.com

In 1978, after losing his teaching job and spouse, William Least Heat Moon set out on a soul-searching, three month road trip to small-town America in an old van and covered ~13,000 miles. His major routes were on secondary roads, often printed in blue color on Rand McNally maps---hence the name Blue Highways. I have always been a Blue Highway sort of person, partially due to my geology interests and partially due to my general inquisitiveness of all things natural. It has been a good life.

Wyoming has a large number of Blue Highways, many of which offer some spectacular views of geology, and a fair amount of mineral collecting. My previous article (P & P, November) presented information on geological features observed along Blue Highways in the Poudre and Laramie River canyons of Colorado. Since I was traveling from the south heading toward the Black Hills in South Dakota, my next Blue Highway was U. S. 30 /287 north from Laramie to near the small community of Bosler where WY 34 travels northeast. My reason for this particular Blue Highway, WY 34, was to locate a somewhat rare and strange rock termed anorthosite. And with that thought, I decided that perhaps a small discussion on the "Precambrian" was in order. And what better place to explore and understand the Precambrian than southeastern Wyoming?

In all of my other written articles I have used the term Precambrian in a very loose sense to indicate quite old rocks of the earth's crust. What I have failed to indicate is that the Precambrian represents a very, very long time span, perhaps the first 4.5 billion years of geologic time---the vast amount of mind-boggling time before the appearance of hard-bodied animals (animals with shells or bones). In contrast to the Precambrian, these hard-bodied animals have only been around for less than .5 billion years. So, the time period of life, as we generally know it, is only about 12% of geologic time.

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January 2012 Annual Meeting at Giuseppe's Depot Restaurant

January 19, 2012: 6:00 p.m. / Reservations by January 8, 2012

Italian Buffet Menu / Caesar Salad & Fruit Platter / Fresh Stone-Baked Pizza

Pasta Bar w/ Choice of two Sauces / Roast Beef & Potatoes

Garlic Bread / The Depot's Fudge Brownie Bits & Gourmet Cookies

/ Coffee or Tea / Adult \$ 25.00 Child \$12.50

ATTENDING _____ AMOUNT ENCLOSED _____

Please make check to CSMS and Send to Katherine Thompson,

December 2011 CSMS Calendar

Thurs., **Dec 1**—*Board Meeting*, 7 p.m., Senior Center. **CANCELED DUE TO WEATHER**

Sat., **Dec**—*Lapidary*—RSVP please. If you would like to cut stones, call Sharon Holte at 217.5683 for an appointment.

Thurs., **Dec 15**—*Board Meeting 6:00 p.m. General Assembly*, 7:30 p.m., Senior Center. **PARTY!!! PARTY!!!**

5:30 p.m. to 6:15 p.m. *Pebble Pups & Juniors*. Steven Veatch, Leader, 719.748.5010

Thurs., **Dec??**—*Crystal Group*, **CANCELED**

Faceting Group, 7 p.m., Senior Center. Paul Berry, Leader, 719.578.5466

Project Group—**TBD**—contact Ron “Yam” Yamiolkoski, yamofthewest@gmail.com

The Senior Center is located at **1514 North Hancock** in Colorado Springs.

Tues., **Dec 8**—*Micromounts*, **CANCELED / ???** Will discuss at November meeting.

7 p.m., Senior Center. Dave Olsen, Leader, 719.495.8720

Tues., **Dec 13**—*Fossil Group*, 7 p.m., Senior Center. Mike Nelson, Leader, csrockguy@yahoo.com

Sat., **Dec**, *Jewelry Group*, By reservation only. Please call, 15610 Alta Plaza Cir., Peyton. Bill Arnson, Leader, 719.749.2328

Camera Club is looking for a leader and meeting place, date and time. Interested? Contact Roger Pittman.

For more information on any of the sub-groups, meetings, and other CSMS valuable information, go to our website, csms.us



January 2012 CSMS Calendar

Tues., **Jan 3**—*Fossil Group*, Canceled for January. Nelson, Leader, csrockguy@yahoo.com

Needs leader for Feb-

Sat., **Jan**—*Lapidary*—RSVP please. If you would like to cut stones, call Sharon Holte at 217.5683 for an appointment.

Thurs., **Jan 19**—*General Assembly*, 6:00 p.m –9:00 p.m., **Giuseppe’s Depot Restaurant**

6:30 p.m. to 7:15 p.m. *Pebble Pups & Juniors*. Steven Veatch, Leader, 719.748.5010

Thurs., **Jan 26**—*Crystal Group*,

Faceting Group, 7 p.m., Senior Center. Paul Berry, Leader, 719.578.5466

Project Group—**TBD**—contact Ron “Yam” Yamiolkoski, yamofthewest@gmail.com

The Senior Center is located at **1514 North Hancock** in Colorado Springs.

Thurs., **Jan 5**—*Board Meeting*, 7 p.m., Senior Center.

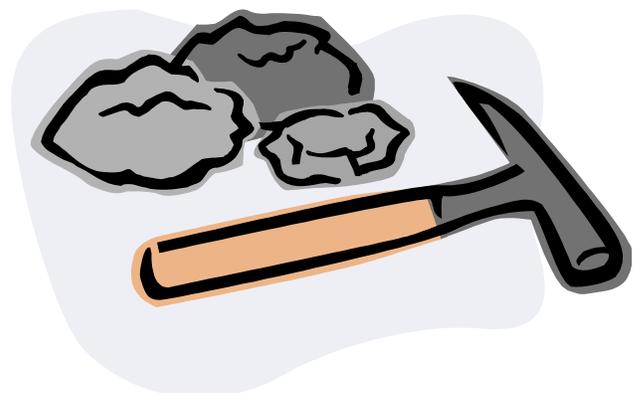
Tues., **Jan 10**—*Micromounts*, **CANCELED / ???** Will discuss at November meeting.

7 p.m., Senior Center. Dave Olsen, Leader, 719.495.8720

Sat., **Jan**, *Jewelry Group*, By reservation only. Please call, 15610 Alta Plaza Cir., Peyton. Bill Arnson, Leader, 719.749.2328

Camera Club is looking for a leader and meeting place, date and time. Interested? Contact Roger Pittman.

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Earthcaching at Red Rock Canyon Open Space

By: Julie Shimon

Co-authored by Pebble Pups Jenna and Jacob Salvat, Katie Morland and Jack Shimon

In November I took a group of the Pebble Pups on a unique geology field trip to Red Rock Canyon Open Space (RRCOS). Admittedly the Pebble Pups like to touch things, climb on things, and ultimately take things home for their collection so I had some explaining to do beforehand... "No, you are not allowed to collect anything here but you will like earthcaching. Yes, it will be fun even without taking rocks home." So what did we do? Our group set out to Earthcache, an offshoot of Geocaching, where the coordinates of the cache take you to a geological feature and require you study and answer some questions put forth by person that set up the Earthcache online. It was a great opportunity for this group because everyone had a job to do, and the tasks kept them busy and made them think.

One of the two Earthcaches we completed was called Soil Formation -GC1PPXV and the objective was to find a fin of **Lyon's Sandstone** and examine the processes that were taking place in the formation of soil on the rock. Soil is formed from the breakdown of inorganic rock combined with organic materials. We learned the mechanisms by which rock is broken down through weathering, both mechanical (temperature, water, ice, pressure) and chemical (a change in the make-up of the rock such as oxidation, dissolution and hydrolysis). In addition, it was perhaps most interesting to our group that biological weathering, a combination of mechanical and chemical forces, also plays a role. This can include events such as seeds being blown onto a surface and then growing roots into the rock depressions, and also the addition of organic materials such as feces or animal carcasses from insects, spiders and small rodents. At coordinates N38 50.774 W104 53.277 we found a very interesting rock face to base our assessment on.

Question: Find another fin, boulder or solid rock face along the Contemplative Trail on which weathering is acting to form soil. Using the information given above, describe the mechanical, chemical or biological weathering that is taking place to create soil at this site.

Weathering section response by Jenna and Jacob Salvat: The rock face that we discovered while looking for fins, appeared to be weathered by erosion. The erosion appeared to be caused by water flowing across the rock face, lichen growing on the rock face causing it to crack and fall apart, and from people scraping their hands or backpacks across the rock face. We later determined that the rock could have eroded further through the freezing process. These were some of our deductions as to how this rock face had been formed.



Caption: A unique rock face to study weathering

The second Earthcache we did was More Fins Than a School of Fish -GC1PQTH and it was much more involved, forcing us to get an in depth look at the sandstone as well as speculate about some of the mechanisms shaping the geology. While the group collectively touched, measured, counted and speculated, the answers to each question are provided by an individual Pebble Pup.

Texture

Question: From the coordinates walk over to the nearest rock wall and run your hand down the rock. Is it smooth or rough? What is the reason for your answer?

Texture Section response by Jenna and Jacob Salvat: The rock wall that we felt with our hands was rough, and formed in ridges. We agreed that this rock ridge was caused by water flowing slowly over the rock long ago. In the red rock we could feel pieces of small rocks fused together, formed by water flowing over the rock long ago depositing different rocks as it flowed.



Continued on Page 4

The Precambrian, and it is formally called a Supereon, is divided into three Eons (remember the Paleozoic, Mesozoic, and Cenozoic are Eons): the Hadean (4.5-3.95 Ga), Archean (3.95-2.5 Ga) and Proterozoic (2.5-.542 Ga) with the abbreviation Ga referring to billions. The .542 Ga or 542 Ma (542 million) is the base of the Cambrian and the time when geologists begin to find hard-bodied animals such as trilobites and brachiopods. Since these shelled fossils, commonly preserved, are often used to date rocks, the time since the Precambrian has been subdivided into quite small units of time and is easier to understand. Another mitigating factor is that many/most Precambrian rocks have been subjected to episodes of metamorphism and igneous activity, both in the Precambrian and in later eons. It is easy to go out and locate a post-Precambrian sandstone or limestone. However, very few of these sedimentary rocks are preserved as such in the Precambrian record (except some very young ones). Most have been metamorphosed to quartzite or schist or gneiss or marble or actually re-melted and turned into igneous granite.

For additional information on geologic time see the Geological Society of America time scale at: www.geosociety.org/science/timescale/timescl.pdf

Sims and Finn (2001) have described the Precambrian rocks (aka “the basement”) of Colorado in great detail and the following description is from their paper. In most of our state, the basement consists of crystalline igneous and metamorphic rocks lying stratigraphically below the layered sedimentary rocks of the post-Precambrian (aka Phanerozoic). In some places, however, sequences of younger Precambrian sedimentary rocks overlie the crystalline rocks; these sequences are included as basement.

The oldest rocks in Colorado are found in a very small area (less than 50 acres) in far northwestern Colorado in the Uinta Mountains (Matthews, 2009; Fig. 1). These rocks are termed the Owiukuts Complex and were metamorphosed about 2.7 Ga—in the Archean. This means that the original rocks were older than this date; something had to be there to metamorphose! The Owiukuts Complex is actually part of Wyoming—more on this later.

Most of the Precambrian rocks of Colorado, the ones that core the north-south trending mountain ranges, are composed largely of Proterozoic metamorphosed volcanic-sedimentary gneisses and schist, and some igneous intrusive rocks. The radiometric dates cluster around 1.75 Ga but again

there needed to be earlier rocks to metamorphose—geologists just don’t know where they came from but suspect oceanic volcanic island rocks. Then around 1.4 Ga a second major intrusive event emplaced several granitic types of rocks such as the Sherman Granite discussed last month. And finally, a single large batholith (large intrusive event) left us the Pikes Peak granite at ~1.05 Ga. In summary, readers can think of Precambrian rocks in Colorado as being ~1.75 Ga metamorphic rocks, ~1.4 Ga granite, and ~1.05 Ga Pikes Peak granite. The Precambrian rocks of Wyoming consist mainly of three major geologic terranes: the Archean *Wyoming Province*, the Proterozoic *Trans-Hudson Orogen*, and the Proterozoic *Colorado Orogen*. In this usage orogen refers to a belt of deformed rocks commonly metamorphosed and intruded by igneous bodies—the rocks associated with a tectonic or mountain building event.

The oldest rocks in the Wyoming Craton, perhaps as old as 4.0 Ga (but most are 2.5-2.8 Ga), include intrusive igneous and granite-like rocks as well as some metamorphic rocks. The Wyoming Province is often called the Wyoming Craton since it represents a very stable part of the ancient Precambrian “continent”. In fact, this piece rock is considered to be the “core” of the North American continent. Most of the Wyoming’s mountain ranges where the Precambrian crops out have rocks of this age--Archean. Rocks of the Trans-Hudson Orogeny, ~1.9 Ga, represent a suturing of the Wyoming Craton to another stable craton to the east (current direction) termed the Superior. Trans-Hudson rocks are found only in the subsurface in the eastern part of the state, but are exposed in the nearby Black Hills. The Colorado Orogen, includes the metamorphic rocks with dates around 1.75 Ga as well as the 1.4 Ga intruded granites in the southern Laramie and Medicine Bow Ranges such as the Sherman Granite. Above discussion from Sims and others, 2001.

One of the amazing features associated with the exposed Precambrian rocks of Wyoming is a narrow belt of highly deformed and tectonically disturbed rocks termed the Cheyenne Belt (Fig. 2). This zone is part of the tectonic suture between two Precambrian provinces, a place where the older Archean rocks (Wyoming Craton) collided (plate tectonics) with the younger rocks of the Colorado Orogen. This is an amazing site, at least for a geologist! The North America continent was growing.

One of the best places to see the suture zone up close is to travel Blue Highway WY 130 west from

Laramie through Centennial over the Medicine Bow Mountains to Saratoga (Fig. 3). Popularly known as the Snowy Range Scenic Byway, the highway travels through some of the most fantastic scenery in Wyoming. At the Nash Fork Campground, about eight miles west of Centennial, the road crosses the suture line and travelers may observe slate and phyllite that is complexly folded and crinkled (Hausel, 1993). Rocks north of the Cheyenne Zone in the Medicine Bow Mountains contain the very old Archean crystalline rocks overlain by several tens of thousands of feet of late Archean and early Proterozoic metavolcanics, metasediments (last two terms refer to lightly metamorphosed sediments and volcanics), quartzite, conglomerate and various other rocks that were deposited in rivers, braided streams and shallow marine waters in this ancient Precambrian environment—perhaps an environment similar to the Atlantic coast of North America. The best known geologic unit is the Snowy Pass Supergroup that includes the Medicine Peak Quartzite, the almost white sugar sand quartzite that forms the high peaks of the Snowy Range. Also included in the Snowy Pass Supergroup are other sedimentary rocks containing some of the most beautiful stromatolites in the U. S (Fig.4). These features are composed of calcium carbonate (calcite), cabbage-like domes deposited in shallow marine waters by cyanobacteria (aka blue-green algae)(Fig. 5). They may be seen near the Sugarloaf Recreation Area.

For a very good description of the Snowy Range, complete with road log stops, see the Wyoming Geological Survey Information Circular No. 32 (author: Dan Hausel) at: www.wsgs.uwyo.edu/Publications/OnlinePubs/docs/PIC/PIC-32.pdf

Rocks south of the Cheyenne Belt have been described previously—metamorphic rocks (~1.75 Ga) intruded by granitic plutons (~1.4 Ga).

The Cheyenne Belt extends southwest and barely clips northwestern Colorado where the Owiyukuts Complex is part of the old Archean Wyoming Craton; hence the earlier statement that these rocks are part of Wyoming! To the east the Belt is buried under the Great Plains. Chamberlain (1998) believes the Cheyenne Belt may extend west to northeastern Nevada.

All of this discussion on the Precambrian leads the traveler back to WY 34 heading northeast from Bosler. The highway traverses through numerous outcrops called the Laramie anorthosites and they are worth a stop to examine the road cuts. Anorthosite is a rather strange igneous rock that is

composed almost entirely (at least 90%) of the feldspar mineral plagioclase, but especially common is the variety labradorite (Fig. 6). Geologists have determined that the igneous magma forming the rock could not have been 90% enriched with plagioclase. Therefore, the mineral must have somehow segregated from the main magma mass (Lindsley and others, 2010). At any rate, the anorthosite was intruded into the Laramie Mountains during the ~1.4 Ga igneous event. North of these outcrops the mountains cross the shear zone and the rocks become older. Many of the anorthosite specimens display the labradorescence of the mineral, and they are really nice when slabbed and polished.

The final tour of the Wyoming Precambrian along a Blue Highway is to examine exposures along WY 270 from Guernsey north to Manville. This road bisects a geologic structure called the Hartville Uplift, a north-south trending Laramide (Rocky Mountain) uplift exposing Precambrian rocks in the center surrounded by outward dipping Paleozoic rocks (Sims and Day, 1999). The uplift is part of the Wyoming Craton and ties in the Laramie Range to the Black Hills and also separates the Denver Basin (east) from the Powder River Basin (west); the rocks are mostly Archean in age but there are some Proterozoic igneous intrusions.

The Precambrian exposures are of interest to Coloradans since the rocks contain large deposits of iron, both banded iron formations and specular hematite. Iron was first produced from the Sunrise mine, and later the Chicago, Central, and Good Fortune mines, near the towns of Hartville and Sunrise in the late 1800's (Figs. 7 & 8). These mines then shipped the hematite ore to the Colorado Fuel and Iron Corporation open-hearth furnaces in Pueblo, Colorado (Sims and Day, 1999). At the time mining ceased at the Sunrise mine in 1980, the Hartville district had produced about 45 million tons of iron ore (Hausel, 1989).

The September 13, 1907 edition of the ***Mines and Mining*** reported: *Sunrise is a company town in the fullest sense. Everything, and may it be said everybody, is owned by the Colorado Fuel and Iron Company. No special brand is necessary, for the fact impresses itself indelibly on all who come here. Visitors are not especially welcomed, which a glance at the passenger accommodations on the train that meets the Colorado & Southern at Hartville Junction forces itself on all comers.*

From Hartville Junction the spur to Sunrise via Guernsey, a distance of about fifteen miles, belongs and is operated by the Colorado Fuel and Iron

Continued on Page 6

Company. It is a fine piece of railroad engineering with its high grades and frequent curves and one would not mind paying two prices for transportation, as he must. If only the accommodations were adequate, but, as has been said, the company seems not to care for that sort of traffic. Having constructed the line for its own convenience (sic), no doubt it considers itself an accommodator of the public by attaching a caboose to its trains of ore cars, which caboose has poor seating capacity for about eight people, through several times that number travel over the route as a rule.

The employees were forced not only to depend on the favor of the Company for the opportunity to earn a living, but to live in such houses as the Company furnished, to buy such food, clothing and supplies as the Company sold them, to accept for their children such instruction as the companies wished to provide, and to conform even in their religious worship to the Company's wishes.

In summary, southeastern Wyoming has a number of interesting geological features and rocks associated with the Precambrian. The southern Medicine Bow and Laramie Ranges have rocks that belong to the Colorado Orogen and date to the younger part of the Precambrian termed the Proterozoic. Metamorphic rocks have dates ~1.75 Ga and are intruded by granites, such as the Sherman, with dates clustering around ~1.4 Ga. The northern boundary of these rocks is a shear zone termed the Cheyenne Belt and represents the suturing of the Colorado Orogen to the much older Wyoming Craton (rocks of the older Precambrian termed the Archean). These Archean rocks are exposed in the northern part of these ranges as well as in the Hartville Uplift. In addition, in areas around the suture zone in the Laramie Range (northeast of Bosler) large plutons of anorthosite crop out.

Travelers should make every effort to travel these Blue Highways as they offer many more chances to examine the geology than say, I-25! We also need to remember that the total environment back in the Precambrian was so much different than what we see at the present. Physical environments were similar in that the land contained streams and the oceans had different marine zones; however, plants and animals as we know them did not exist. In addition, the atmosphere contained much less oxygen and the ozone layer did not exist.

Enjoy the travel and remember the words of J. W. Schopf: *For four-fifths of our history, our planet was populated by pond scum*



Fig. 1. Owiukuts Complex (Archean) exposed in northwestern Colorado overlain by the Proterozoic Uinta Mountain Group. Photo cropped from Matthews, 2009.

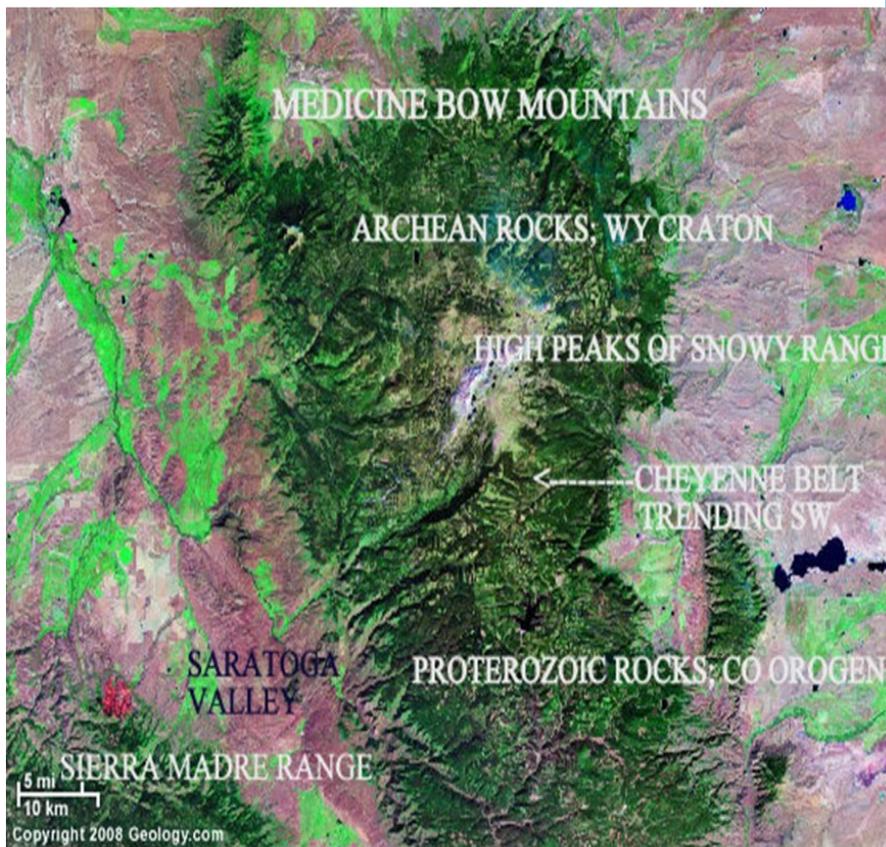


Fig. 3. Landsat satellite image Medicine Bow Mountains, Wyoming. Cheyenne Belt trending NE-SW below high peaks of the Snowy Range (compare with Fig. 2). Image from www.geology.com.

Continued on Page 7

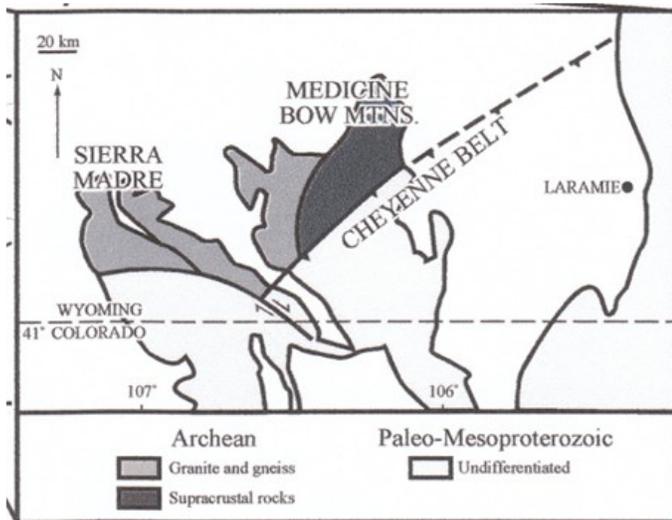


Fig. 2. Sketch map showing location of Cheyenne Belt in southeastern Wyoming. From Ward, 2010: www.colorado.edu/GeolSci/Resources



Fig. 4. Proterozoic stromatolites in the Snowy Pass Supergroup, Medicine Bow Mountains, Wyoming. Photo courtesy of Geological Sciences, University of Colorado.



Fig. 5. Modern stromatolites growing in Shark Bay, western Australia. Photo courtesy of Paul Harrison and Wikipedia.



Fig. 6. Hand sample of anorthosite from Laramie Mountains. Note penny for scale and “blue” labradorescence of some individual crystals.

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Caption: Jack feels the texture of the rock

Size Matters

Question 1: A good deal of **Lyon’s Sandstone** was formed from alluvial-fan deposited material. View the many different sizes of particles and measure the largest and smallest you can find.

Question 2: Looking at the sizes of the particles in the rock, do you think it was a fast-moving stream or slow-moving stream that deposited this material? Explain your answer.

Jack’s Response:

Rocks formed by Alluvial Fans have a large differential in the particle size. They are formed when material is carried through a restricted area such as a canyon and then is allowed to disperse over a greater area. As the water flow

slows, particles settle, the largest settling first.

Answer 1: The smallest particles were less than 1 centimeter (actually closer to a few millimeters) and the biggest one I found was 6 inches across.

Answer 2: This was arguably the most difficult question posed to the Pups. There were many theories but the two pre-dominant ones at the end of the discussion were either fast-moving because the water flow would have to be very strong to knock out and move rocks over such a great distance or slow-moving because there are lots of different sizes and shapes of sediments forming unique layers in the sandstone. Ultimately they all agreed on the theory that the slow-moving stream formed this

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Fig. 7. Sunrise Mine ca. 1907. Photo courtesy of Wyoming Tales and Trails.

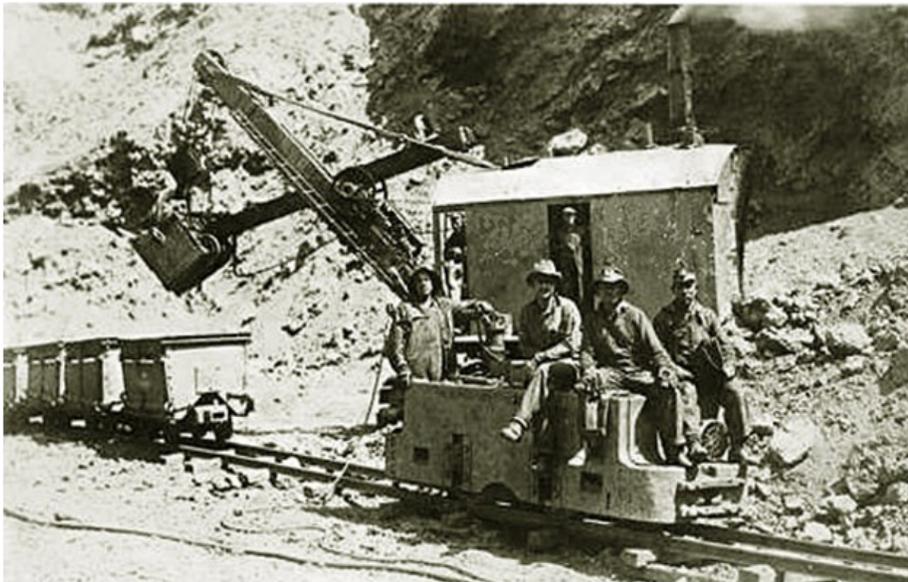


Fig. 8. Steam shovel at Sunrise Mine. Photo courtesy of Wyoming Tales and Trails.

The End

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particular area although there were different sized particles throughout the wall so there must have been multiple incidents of deposition, or layering.

Caption: Paul shows Katie and Jack how to measure particle size

The Overlook

Question: Follow the fins of **Lyon's Sandstone** as they are exposed northward into the Garden of the Gods Park. Estimate the distance that you can see them before they disappear.

Group Response: Miles and miles!! Probably 5-10 miles.





Caption: Photo of the fins of **Lyon's Sandstone** from the Overlook



Crossbedding

Question: The layering at this location shows a crossbedding pattern from successive deposition of sands and gravels. It's easy to see each layer and the material that was deposited from each event. Using your ruler, measure off 6" (15cm) perpendicular to the bedding and count the number of layers. Katie's Response:

As layers of loose rock, sand and soil are laid down, they make patterns. Some of the layers have the same sized pieces and some layers have different sizes. The amount of water that moved smaller pieces was much less than the amount of water that moved the larger pieces. After a long time, the layers and patterns became solid. This is what we see today. Answer: On one spot there were 6 layers. At another spot there were 10 layers.

Caption: Jack, Jane and Katie at the crossbedding site



Caption: How to measure layers perpendicular to the crossbedding

The End



Press Release:

Contact: Steven Veatch Phone: (719) 748-5010

FOR IMMEDIATE RELEASE

9 A.M. EDT, December 10, 2011

DISTRICT 11 STUDENTS, WORKING WITH STUDENTS IN LAKE GEORGE, COLORADO AND IN DENVER (VIA THE INTERNET) HAVE AN ARTICLE PUBLISHED IN AN INTERNATIONAL ROCKS, GEMS, AND FOSSILS MAGAZINE

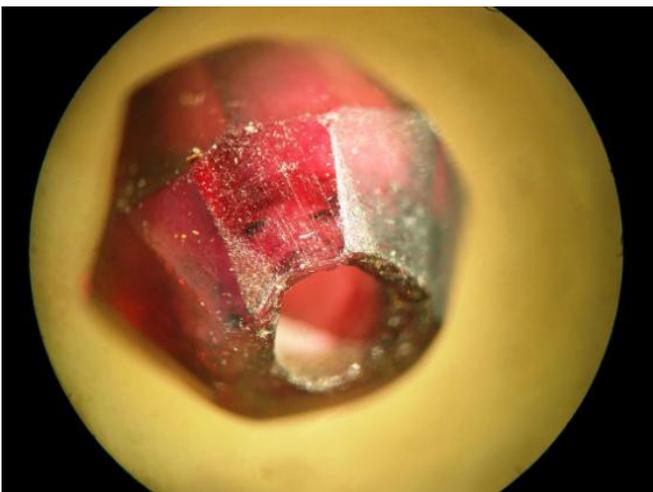
FLORISSANT, CO DECEMBER 9, 2011: The youth group of the Colorado Springs Mineralogical Society Club (CSMS), along with the youth group from the Lake George Gem and Mineral Club, and two students from Denver who participate via the Internet, worked with ancient Egyptian rocks and minerals that were fashioned into jewelry and ritual objects over 3,000 years ago. These objects were removed from Egyptian tombs at least 100 years ago and have been sold on the antiquities market.

While working with these remarkable artifacts the students learned Egypt was the first nation to be established in the

history of mankind and that the Egyptian civilization lasted 3,000 years—longer than any other civilization on the planet. When the teenage pharaoh Tutankhamen ruled Egypt, the pyramids of Giza had already been built well over 1,000 years earlier. When Cleopatra came to power, Tutankhamen had been a mummy for more than 1,000 years.

While working with semiprecious gemstones, the students, ranging from 4th grade to middle school, experienced the mystery of ancient Egypt, hieroglyphs, scarabs, sphinxes, obelisks, and mummies.

The precious and semi-precious gemstones available to the ancient Egyptians were used for beads, pendants, amulets, inlays, scarabs, and other personal ornaments.



The youth members of both clubs worked with ancient artifacts fashioned from carnelian, blood-red garnet, and deep blue lapis lazuli made 3,000 years ago.

The group of young students reviewed basic laboratory procedures and then examined each artifact under a microscope, learned to capture images through the microscope of each item, take measurements, and then record their findings. Research methods were taught to each student. The students were then given a specific research assignment to complete. Some of the students with art skills provided artwork. The research was assembled into an original article by the students on these artifacts.

The article was published earlier this year by *Deposits*, an international mineral, gem, and fossil “glossy-type” magazine in volume 25. Magazines were provided by the magazine’s managing editor for each student and the magazines were presented to them at a special meeting with their parents. **This is an unprecedented achievement by a group of students from various age groups and schools.** One middle school student participated via the Internet as he lives too far away from either club.

All of the students who worked on the article won science writing awards as follows:

1. Rocky Mountain Federation of Mineralogical Societies (13 states) **FIRST PLACE**
- American Federation of Mineralogical Societies (nation-wide contest) **THIRD PLACE.**

All of the students received citations, ribbons, and beautiful plaques.

The School District 11 students who were coauthors are as follows: Victor Gordillo, Kyle Helmick, Krystal Arnold,

Cameron Jesse, Kurt Lahmers, Victoria Arnold
These students will be honored during the January 4th 2012 meeting of the Colorado Springs School District Board of Education Meeting. The meeting will start at 6:30 pm. The students and parents will attend and the student’s achievements will be honored and recognized at this time.

The Colorado Springs Mineralogical Society’s youth group meets the third Thursday at the Colorado Springs Senior Center from 5:30 to 6:15 pm. Roger Pittman is the president of the Colorado Springs Mineralogical Society. **Steven Veatch**, a Teller County geoscientist, heads this group. He is assisted by **Diana Biggs** and **Julie Shimon**. The website for the student groups in Colorado Springs and in Lake George are at this URL: <http://pebblepups.blogspot.com/> Call **Steven Veatch** at 719-748-5010 for more information.

The End



PRESIDENT'S CORNER

by Roger Pittman, CSMS

Here it is almost December as I sit down to write my last message for 2011. I hope everyone comes to our Christmas party, Kaye has several new things planned and it sounds like a lot of fun. I've been out in my shop suffering from Geppetto syndrome, I've found a cute Mammoth pattern and I keep sawing them out of every scrap of wood I can find and apparently I haven't a Fairy Godmother or any other magic because none of them have come to life. So I'll be trying to get the Pebble Pups to adopt some of these at the December meeting. Maybe they have better magical connections than I. Remember that dues are due, banquet tickets for our January installation banquet are for sale. Have a Merry Christmas and a Happy New Year!



Caption: Roger and Pat's back yard—stone pile and fountain.

WMMI Happenings

225 Northgate Blvd., CS, CO
80921

Main: 719.488.0880/Toll Free:
800.752.6558 info@wmmi.org

Hours: 9 a.m.- 5 p.m., Monday-Saturday (June-August)

9 a.m.- 4 p.m., Monday-Saturday (September-May)

Daily Guided tours at 10 a.m. and 1 p.m. (included in admission).

The Western Museum of Mining and Industry is a private, nonprofit museum founded in 1970. We educate over 8,000 school children a year on the importance of mining in the American West.

Trains! Trains! Trains! in November and December

Pikes Peak N'gineers

Train and Toy Exhibit

November 25 thru December 31

9:00 a.m.-4:00 p.m.

The Western Museum of Mining & Industry presents a unique exhibit featuring the 'HO' scale "Toy Story Train" circling many interesting toys that visitors can identify and reminisce about from their childhood. Vintage toys from the 1940's, 50's and 60's will be on display from a private collection. Visitors will decide what minerals and other materials were used to make the toys. The museum will display their Virginia & Truckee large model engine and coal tender known as Nevada's Bonanza Railroad and "The Queen of the Shortline". The V & T hauled silver ore from the Comstock Lode in Virginia City as well as supplies up and down the line from Reno to Carson City to Virginia City to Minden. Come visit this new exciting Holiday display at the museum that celebrates trains.

Customary admission applies to see these November and December exhibits and displays. For more information contact the museum at 719-488-0880 or info@wmmi.org.



2011 CSMS Officers

Roger Pittman, President

Kay Thompson, Vice President

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Mike Nelson, Fossil Group

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Sharon Holte, Lapidary Group

Steven Veatch, Juniors & Pebble Pups

Dave Olsen, Micromount Group

Brian Paterson, Webmaster

To contact an officer or chairperson, go to csms.us, click on Board Members, and, if their name is underlined, click on it.

Sub-Group Responsibilities for Refreshments for General Assembly Meetings

Feb.— Crystal	Mar.— Faceting	Apr.—Fossil
May— Jewelry	June— Lapidary	July—Micromounts
Aug.—Picnic	Sept.—Projects	Oct.—Board

Press Release:

Contact: Steven Veatch Phone: (719) 748-5010

FOR IMMEDIATE RELEASE

9 A.M. EDT, December 10, 2011

PRELIMINARY ANNOUNCEMENT: COLORADO SPRINGS, LAKE GEORGE, DENVER PEBBLE PUPS, AND FOSSIL KIDS FROM WESTERN INTERIOR PALEO SOCIETY HAVE SPECIAL BEHIND-THE-SCENES MEETING WITH DR. IAN MILLER TO SEE SNOWY AND OTHER SNOWMASS FOSSILS

FLORISSANT, CO DECEMBER 11, 2011: The youth group of the Colorado Springs Mineralogical Society Club (CSMS), the Lake George Gem and Mineral Club, the Denver Pebble Pups, and the Fossil Kids from the Western Interior Paleontological Society have a special date with **Dr. Ian Miller** planned on January 21, 2012 at the Denver Museum of Nature and Science (Montview and Colorado Boulevard, Denver). Only 16 pebble pups/fossil kids are allowed to meet Dr. Miller and see the fossils that have been recovered so far from the Snowmass Project.

ADMISSION IS FREE FOR ALL STUDENTS AND ADULT CHAPERONES. We will meet Dr. Miller and work with him for about an hour. After that, parents may come in to meet their children at the atrium and join us; however, standard museum admission will apply for the parent. **Denver area parents may leave their children at the museum and then pick them up at 3:15 pm.** Parents and children from Lake George and Colorado Springs may want to carpool (Steven Veatch will help with this).

Parents and children may bring a lunch or buy lunch in the *T. rex Cafeteria*. All of us will eat together and talk about fossils and our clubs. The parents, chaperones, and students will tour Paleo World, the Hall of Minerals, and attend a program at the planetarium. Planetarium tickets are as follows: adult tickets are \$5, student tickets are \$4.

Since we have a **very limited number of openings for this awesome chance to meet Dr. Miller and view the paleontological work done at Snowmass, registration will be as follows:**

Send an email **FIRST** to Steven Veatch (steven.veatch@gmail.com) to see if there are any openings left and be sure to state the club the student is in. If there is an opening, Steven Veatch will reply, then you must send a letter to Steven Veatch stating the name of the pebble pup/fossil kid; the name of the club, and as much contact information as possible, including: home phone, cell phone, and email. **To ensure attendance**, a check made payable to the Colorado Springs Mineralogical Society for \$20 is required. When the student shows up at the museum **the check will be returned. If the student does not show up at the museum, the check will be deposited for the benefit of the CSMS pebble pup program and the money forfeited.** This is only to ensure attendance as the student spaces are so limited. A hold-harmless letter will be sent to the parent to be completed and sent back to Steven Veatch to complete the registration process.

You must not hesitate, and register with Steven Veatch immediately.

Continued on Page 13

We plan to meet to follow the following **itinerary**, but it is subject to change:

10:00 am meet with Dr. Ian Miller, see Snowy and other fossils from Snowmass

11:00 am explore the Paleo World area.

12:00 pm meet for lunch. Bring a sack lunch or buy lunch at the T. rex Café, but we will try to sit together for discussions and fun.

12:45 pm explore the Hall of Minerals

Sometime in afternoon: **attend the planetarium**

3:15 pm End of the field trip at the Denver Museum of Nature and Science.

The adult chaperones are as follows:

1. Steven Veatch
2. Julie Shimon
3. Dr. Dennis Gertenbach
4. Betty Merchant

There will very likely be some **fine-tuning with the start time** at the museum **and other details**. To make this process very smooth Steven Veatch and/or Julie Shimon will send out updates via email weekly to those lucky pebble pups/fossil kids that get on the list. Updates will also be posted on the Pebble Pup website:

Pikes Peak Pebble Pup Blog:

<http://pebblepups.blogspot.com/>

Steven Veatch, a Teller County geoscientist, heads this group. He is assisted by **Julie Shimon** and **Diana Biggs**.

Call **Steven Veatch** at 719-748-5010 for more information.

The Colorado Springs Mineralogical Society

November 2011—General Assembly Minutes

1. The meeting was opened at 7:30 p.m. with the Pledge of Allegiance by CSMS Preside Roger Pittman
2. Kaye Thompson introduced Richard Parsons current President of www. RockyMountain-MicroMineral-association.com who then gave us an excellent presentation titled “World of Perfect Minerals” (micro Minerals)”
3. After a short break visitors and new members were asked to introduce themselves
4. September minutes were approved as sent out by e-mail.
5. Satellite groups announced their November meeting plans
6. Kaye announced that we’re having our installation banquet at Giuseppe’s Depot event center, tickets are available NOW!
7. Elections of officers were held. There was a nomination from the floor by Mike Nelson for Jack Thompson to be member at large. Jack agreed and since there were no contested positions, the club voted to approve a “white ballot” and the following volunteers were elected in the following positions.
President—Roger Pittman
Vice President—Kaye Thompson
Secretary—Jean Miller
Treasurer—Ann Proctor
Editor(s) Sharon Holte / Ellie Rosenberg
Membership Secretary—Veronica Poteat
Member at Large—Mark Lemesany
Member at Large—Jack Thompson
8. With no additional business, the meeting was adjourned at 9:00 p.m.



A Closer look at A Jurassic Dinosaur Bone from the Morrison Formation, Colorado: A Dinosaur Bone Primer

By Kurt Lahmers

Colorado Springs Mineralogical Society Junior Member

A closer look at a dinosaur bone found in the Garden Park area of Cañon City, Colorado (USA) shows some interesting details on the end of the bone. The holes in the dinosaur bone shown in figure 1 used to be tube-like structures called Haversian canals. Haversian canals are branching channels where the blood vessels and nerve fibers are carried through the bone.

Surrounding these canals are bone tissues called osteons. The osteons are part of the cortical bone, or the compact bone.



Figure 1. As shown in this photo, the Haversian canals have dried out, leaving hollow holes throughout the bone. Photo by K. Lahmers. S.W. Veatch specimen.

Continued on Page 15

The cortical bone is the structure of bone that holds up the body, while on the other hand, the spongy bone marrow (cancellous bone) produces red blood cells. The cortical bone is the outside structure of the bone that surrounds the cancellous spongy bone.

This dinosaur bone that is part of this study is on siltstone. Siltstone is composed of very fine-grained sandstone that has been deposited as silt. Through heat and pressure, this silt compacted and hardened into siltstone. This material is found in semi-quiet depositional areas including ponds and lakes where standing or slow moving water permits fine-grained sandstone to fall to the lakebed forming silt. The dinosaur could have died either while in or near a body of water. Silt covered the bones and the water allowed silica to replace the cells, one-at-a-time over a millennia.

This large dinosaur bone (figure 2)—petrified in what became known as the Morrison Formation—quietly waited to be discovered and studied by the Colorado Springs Mineralogical Society (CSMS) Pebble Pups and Junior members. This paper is the result of a CSMS Pebble Pup and Junior member study group to: 1) look some of the structures of a dinosaur bone and, 2) to learn how to take pictures of paleontological specimens. We accomplished our mission in the 45-minute monthly class. More exciting studies and papers are planned.

Bibliography

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Unk., . "Siltstone." Siltstone. LSF, 18/07/00. Web. 17 Jul 2011. <<http://csmres.jmu.edu/geollab/fichter/SedRx/Rocks/Silt1.html>>.

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Unk. "Haversian Canal." Wikipedia. March 2011. 1. USA: Wikipedia Foundation, 2005. Web. <http://en.wikipedia.org/wiki/Haversian_canal>.

Author's biography: Kurt is a member of the CSMS Junior study group and is a 9th grade student at Doherty High School in Colorado Springs, Colorado. He is a respected mentor to the younger Pebble Pups.

The End

FROM THE LIBRARY

by Ellie Rosenberg, CSMS

More Library information from Ellie and Frank to follow in February 2012



Figure 2. This Jurassic dinosaur bone was once a rather large, live, and active dinosaur that was part of a prehistoric ecosystem that included streams and ponds. Photo by K. Lahmers. S.W. Veatch specimen.

THINGS TO DO FROM CSMS

MEMBER PETE MODRESKI

December 2011

Coming Earth Science Events,

None for December.

PICK&PACK

Our Staff...

Teri Stoiber and Ann Proctor *Editors*

CSMS Members *Reporters*

We encourage everyone to submit articles, photos, illustrations or observations.

Share your experiences, trials and tribulations, your new finds, or simply your experience at our last field trip.

The ability to write well is NOT a requirement. We will fix the grammar while keeping the author's voice, style, and work intact.

Handwrite it, type it, or email it. Format does not matter. All submissions are welcomed.

DEADLINE for items to be included is the Saturday after the General Assembly every month.

To submit an item, please use the following:

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

All articles not shown with an author are provided by the Editor.

Mail or email to:
blacklabaccounting@gmail.com

Pick & Pack Editors
PO Box 2
Colorado Springs, CO 80901

The PICK&PACK is published at least ten (10) times per year; 350-375 copies e-mailed/mailed per month (no issues in January or August).

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Take care: Sharon & Ann

NOTICE—Items listed for sale in the Pick & Pack are displayed only as an informational service to our members and advertisers. CSMS and/or the Pick & Pack do not promote nor warranty any item displayed.

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CSMS

T-Shirts, Badges, and Pins

are available for sale. See Store Keeper, Ann Proctor.

Hurry! Hurry!! Hurry!!

Have You Picked Up Your Membership Award Pin(s)?

If you celebrated a CSMS anniversary in 2007, 2008, 2009, or 2010, your year pin award is available from the Storekeeper, Ann Proctor.

More advertisements please!!

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APPLICATION FOR MEMBERSHIP

- All memberships run from **January 1 to December 31**.
- Any person or corporation joining the CSMS as a new member after June 30th shall pay half of the yearly rate. Corporate Membership grants up to five (5) Individual Memberships. Any person or corporation joining as a new member after October 1st receives membership for November and December plus the following year beginning January 1. The partial year membership shall not apply toward the 25 year Lifetime Membership.
- Anyone who has previously been a member **MUST** pay the full rate each year **REGARDLESS** of the time of the year they pay their dues.
- Members who have paid their dues for 25 years will be awarded a Lifetime Membership on their 26th year. Lifetime Members receive all of the CSMS benefits and no longer have to pay the annual dues. Individual Memberships provided by Corporate Membership are excluded from Lifetime Status.
- Corporate membership grants up to 5 individual memberships and one Yearly (10 issues) 3.5 x 2" advertisement in the CSMS Pick & Pack.
- Members in good standing receive the following benefits: 10 electronic issues of the CSMS *Pick&Pack* newsletter, right to participate in all field trips (additional fees may be required on some field trips and members are responsible for all transportation to and from), participation in one or all Satellite Groups (some groups may request additional fees to help cover resource costs), free admission to the Western Museum of Mining and Industry, a year of learning and enjoyment, plus a lifetime of memories.

LAST FIRST MIDDLE

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HAVE YOU PREVIOUSLY BEEN A MEMBER OF CSMS NO YES WHEN

YOU ARE PAYING FOR THE YEAR

Each year the Colorado Springs Mineralogical Society publishes a Membership Directory. *The directory is distributed **ONLY** to CSMS members.*

Your dues **MUST** accompany this application Check if you do **NOT** want your name & address included

* Will and can you receive the newsletter via email? YES NO

	All Members	All Members	New Members Only	
	Before Jan 31	After Jan 31	After June 30	Oct 1 – Jan 31
<input type="checkbox"/> Junior Membership (12 –17 years old and parent is not a member)	<input type="checkbox"/> \$10.00	<input type="checkbox"/> \$15.00	<input type="checkbox"/> \$ 7.50	<input type="checkbox"/> \$10.00
<input type="checkbox"/> Individual Membership (18 and over)	<input type="checkbox"/> \$25.00	<input type="checkbox"/> \$30.00	<input type="checkbox"/> \$15.00	<input type="checkbox"/> \$25.00
<input type="checkbox"/> Family Membership (parents & dependents under 18)	<input type="checkbox"/> \$35.00	<input type="checkbox"/> \$40.00	<input type="checkbox"/> \$20.00	<input type="checkbox"/> \$35.00
<input type="checkbox"/> Corporate Membership (entitles up to five (5) Individual Memberships)	<input type="checkbox"/> \$95.00	<input type="checkbox"/> \$100.00	<input type="checkbox"/> \$50.00	<input type="checkbox"/> \$95.00

YOUR INTERESTS <i>Please check ALL that apply</i>			
CRYSTALS <input type="checkbox"/>	MICROMOUNTS <input type="checkbox"/>	PROJECTS <input type="checkbox"/>	Sometimes knowing where our members are employed or retired from helps us when we are looking for special information or guidance in our activities. This information will not be published or accessible except by the CSMS Board of Directors:
FOSSILS <input type="checkbox"/>	FACETING <input type="checkbox"/>	YOUTH ACTIVITIES <input type="checkbox"/>	
LAPIDARY <input type="checkbox"/>	SILVERSMITHING <input type="checkbox"/>	OTHER <input type="checkbox"/>	
JEWELRY <input type="checkbox"/>	PHOTOGRAPHY <input type="checkbox"/>		
METEORS <input type="checkbox"/>	FLUORESCENTS <input type="checkbox"/>		
VOLUNTEER CAPABILITIES <i>Clubs are made up of volunteers!</i>			
ARTIST <input type="checkbox"/>	CLUB OFFICER <input type="checkbox"/>	EDITOR <input type="checkbox"/>	List any other things you may be willing to do:
MAILING <input type="checkbox"/>	LOCAL SHOWS <input type="checkbox"/>	WRITING <input type="checkbox"/>	
PROGRAMS <input type="checkbox"/>	FIELD TRIPS <input type="checkbox"/>	LIBRARY <input type="checkbox"/>	
PUBLICITY <input type="checkbox"/>	WEB SITE <input type="checkbox"/>	REFRESHMENTS <input type="checkbox"/>	

I hereby agree to abide by the Constitution and By-Laws of the Colorado Springs Mineralogical Society.

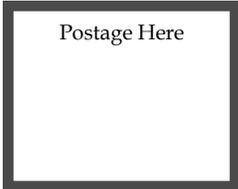
CSMS Constitution and By-Laws are available at our website: www.csms.us

Signature of Primary Applicant _____

Application Date _____

Mail this form and your payment to:

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PICK&PACK
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Joining the Colorado Springs Mineralogical Society (CSMS)

General Assembly meetings are held the third (3rd) Thursday of each month, except January & August, beginning at 7:30 p.m. at the Colorado Springs Senior Center, 1514 North Hancock Blvd., Colorado Springs, CO. **Visitors are always welcome.**

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, Jewelry Group, Lapidary Group, Micromounts Group, and Pebble Pups/Juniors. For details on Satellite Group meetings, see page 30.

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*, a year of learning and enjoyment, plus a lifetime of memories.

Individuals—\$30 Family—\$40 Juniors—\$15 Corporate—\$100 Application is on page 33 and at csms.us