

THE BULLETIN OF THE COLORADO SPRINGS MINERALOGICAL SOCIETY Published Since 1960

BLUEBERRIES, LACCOLITHS, AND LIFE DECISIONS

BY DR. MIKE NELSON, CSMS

Make choices based not on fear, but what really gives you a sense of fulfillment. P. R. Chance

A long time ago, in human years and not geologic time, I managed to graduate from a small, really small (48 total students in school) high school in central Kansas. As a first generation college student I headed off to school without the slightest idea about any sort of a career choice. My knowledge about higher education consisted of wanting to play basketball as that activity paid the way for classes. I sort of failed at both aspects as the court was full of much better players and my grades were not the best. So, I decided to declare a major, engineering, to better define my goals (and hopefully my grades). I was soon out of that field since my skills with a slide rule were pretty meager (hopefully some of the readers might remember these mechanical analog computers). Next came chemistry; however, my only skill in that major was setting records for broken glass ware (it cost me a fortune). One day as a second year student, I "had" passed the first year, I was sitting around reading the college catalog and trying to figure out the rest of my life—when I came across "the geology major". An epiphany was in progress since my mind wandered back to childhood days of collecting rocks and minerals and I marched over to the department and declared a new major! Wow, just like that I had a new meaning in life and I have never looked back.

So, how does my childhood relate to azurite and blueberries? Well, one of the joys of being a geologist is "going to the field", a term I have used several times before in these writings. Many years ago I was working with a paleontologist, in the field, chasing phytosaurs (crocodile-like animals) out near Bedrock, Colorado (far western part of the state). Part of the group decided to wander, on the way home, over to the La Sal Mountains where there was an old copper mine. And, that is how I was introduced to azurite.

The La Sal Mountains are just across the Utah—Colorado state line near Moab, Utah. They are part of a group of scattered and isolated mountain chains known as the laccolithic centers of the Colorado Plateau (Fig. 1). Laccoliths are igneous intrusions that have been injected into layers of sedimentary rocks and have pushed up the overlying rocks into a dome (Fig. 2). The name, laccolite, was first coined by one of the most famous geologists in the annals of the U.S. Geological Survey (USGS), Grove Karl Gilbert in his monograph (1877), Report on the Geology of the Henry Mountains. At the time Gilbert was working for the "Powell Survey", one of the early USGS surveys designed to study the geology of the "American West", and Gilbert was assigned to map the Henry Mountains, the last major mountain range to be "discovered" in



Fig. 1. Location map of mountain ranges associated with laccolithic centers in the Colorado Plateau. The Four Corners is represented by the red dot. L, la Sal Mountains; A, Abajo or Blue Mountains; S, Ute Mountains; C, Carrizo Mountains; H, Henry Mountains; N, Navajo Mountains. Photo from National Aeronautics and Space Administration Visible Earth Project.

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CSMS is an incorporated nonprofit organization with these 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 is published 10 times each year to assist and promote the above.

Proud Members of:

American Federation of Mineralogical Societies (AFMS)

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Colorado Springs Mineralogical Society Founded in 1936 Lazard Cahn Honorary President

Articles in this Issue:

Blueberries, Loccoliths, &	1-3, 5
Picks & Pans	4-5
Sad Passings	5
WMMI Happenings	6
Modreski: Things to Do	6-7
Pebble Pup Honored	7
Silent Auction	8
2011 RMFMS Convention	8
President's Corner	9
Ask a Geologist	11-12
Rare Earths	12-14
A Rock Makes an Excellent Puppy	14
CSMS 75th Annual Meeting	15
CSMS Club Info., Classifieds	16-17
December General Minutes	18

the lower 48 states. Gilbert noted in the Mono- Continued on Page 2

Cont. from Page 1...



graph introduction that the Henry Mountains have been visited only by the explorer. Previous to 1869 they were not placed upon any map, nor was any mention made of them... Gilbert also believed these island mountains were different, not really a chain, and maybe just a

Fig. 2. Cartoon showing an idealized laccolith intruding into sedimentary rocks. Sketch courtesy of Erimus at Wikipedia.

group of five individual mountains (Mts. Ellen at 11,522 feet, Pennell, Holmes, Hillers, and Ellsworth). Furthermore, he stated that instead of rising [the magma] through all the beds of the earth's crust it stopped at a lower horizon, insinuating itself between two strata, and opened for itself a chamber by lifting all the superior (overlying) beds. Gilbert called this type of igneous formation a laccolite, currently known as a laccolith. Today, erosion has stripped off the overlying sedimentary rocks and the core diorite (dark gray igneous rock with large amounts of plagioclase feldspar; emplaced ~20-29 Ma; Sullivan, 1997) core is exposed with the tilted sedimentary rocks cropping out on the mountain flanks (Fig. 3). As in Gilbert's Day, the Henry Mountains are still one of the most isolated ranges in the lower 48 states.

After Gilbert's work geologists then begin to describe other laccolithic centers in the Colorado Plateau (Fig 1.)—the La Sal, Abajo, Carrizo, Ute Mountains, Navajo Mountain, Ophir-San Miguel-



Fig. 3. View, in 1953, of Mount Holmes in the Henry Mountains with a core of diorite and upturned Jurassic beds along the flanks. Photo courtesy of USGS.

Klondike Ridge (Mutschler and others, 1997). All of these laccoliths have the igneous rocks exposed in the center with the exception of Navajo Mountain on the Utah-Arizona state line. At that locality, which is a single domed peak (10,388feet), the overlying sedimentary rocks have not been eroded away to expose the underlying igneous rocks (Fig. 4).

I might add, at this point, that not all laccoliths are large mountains and not all are located in the Colorado Plateau. For example, Tomichi Dome west of Gunnison, Colorado, is a laccolithic dome with igneous magma intruded into the Dakota Sandstone and the Mancos Shale (Fig. 5). Although the elevation is substantial (11,471 feet), the



Fig. 4. Navajo Mountain with part of Lake Powell in the foreground. Photo courtesy of G. Thomas and Wikipedia.

hill is much smaller in size than the large centers in the Colorado Plateau.

The grandest laccolithic center of the Colorado Plateau is the La Sal Mountains near Moab, Utah (Fig. 6). Mt. Peale at 12,721 feet is the highest of this large group of peaks although

Fig. 5. Tomichi Dome, a Tertiary laccolith located in Gunnison County about 20 miles east of Gunnison, Colorado. The dome is situated just south of Waunita Hot Springs and their water temperature may be related to the heat of this igneous intrusion.



11 other peaks have elevations in excess of 12,000 feet (Fig. 7). The mountains are impressive and can be seen from tens of miles distance. The magma, now the rocks diorite and rhyolite, was emplaced around ~28-29 Ma (Sullivan, 1997). The peaks are especially scenic when viewed from Arches National Park to the north.



Fig. 6. La Sal Mountains as seen from Arches National Park.

Immediately to the south of the La Sal Mountains is Lisbon Valley containing the Lisbon Valley Anticline, a large salt anticline where the dipping beds are due to movement/solution of salt in the subsurface (Fig. 8). Several of these salt structures (Fig. 9) are found in the greater Paradox Basin (an evaporate basin in Utah and Colorado near the Four Corners). Although the Valley has several tens of producing gas wells, the most active mineral commodity has been the numerous uranium mines (earliest report in 1913) and the area is undergoing uranium resurgence today. Target zones have been, and still are,

the Cutler Formation/Group (Permian), the Moss Back Member of the Chinle Formation (Triassic), and the Salt Wash Member of the Morrison Formation (Jurassic) found along the flanks of the anticline.



Fig. 7. Mt. Tukuhnikivatz (12,482 feet) in the La Sal Mountains. Photo courtesy of Juozas Rimas and Wikipedia.

Copper also is present in varying quantities and qualities in Lisbon Valley and has been periodically mined for decades. Most of the paying copper deposits seem to be in the Dakota Sandstone and Burro Canyon Formation, both Cretaceous in age----therefore younger and above the uranium beds. Most of the copper ore is chalcocite (Cu₂S) deposited by solutions brought up along the Lisbon Valley Fault (found along the crest of the anti-cline with offset approaching 4000 feet). With time chalcocite oxidizes to such secondary minerals as azurite [Cu₃(CO₃)₂(OH)₂] and malachite [Cu₂(CO₃)₂(OH)₂], both copper carbonates, (but note that azurite commonly pseudomorphs to malachite), and tenorite [CuO] and cuprite [Cu₂O], both copper oxides (SRK Consulting, 2006).



Fig. 8. Satellite image, oblique view, of Lisbon Valley looking northwest down the strike of the Lisbon Valley Anticline. Photo courtesy of Mesa Uranium Corporation.

One of the earliest mining areas in the Lisbon Valley/La Sal District was originally organized in 1892 and generally goes under the name of Big Indian Copper Mine with later mines and claims termed Blue Jay Claim, Blue Grotto Prospect, Nevada Claim, Blue Crystal Mine, and the Texas Claim. A copper processing mill was constructed in 1918 and mining continued sporadically for several decades. The ore body is comprised of oxidized copper minerals (see above) emplaced in the Cretaceous Dakota Sandstone along the downthrown side of the Lisbon Valley Fault; mining has been via open pit and tunnels. In the late 1970's prospectors begin to notice beautiful azurite crystals and specimen collecting went into operation. For example, in 1988 a cut on the Nevada Claim produced one hundred thousand specimens of azurite rosettes (for collectors) and 6000 pounds of broken nodules for paint pigment. Today the claims are generally referred to as the Blue Crystal Mines and the company offers mineral collecting on a fee basis through tours ar-



Fig. 9. Multiple "grabens" in the Paradox Basin. These "grabens" represent a system of linear collapsed valleys caused by movement and solution of subsurface salt layer. Photo courtesy of Marlie Miller and the American Geological Institute.

ranged by Rockpick Legend Company in Salt Lake City and Deep Desert Expeditions in Moab. Besides the abundance of azurite, other minerals collected from the claims and mines include: Wulfenite, Tyrolite, Tenorite, Tennantite, Sphalerite, Quartz, Pyrite, "psilomelane", Olivenite, Malachite, Kaolinite, Goethite, Enargite, Djurleite, Diginite, Cuprite, Covellite, Cornwallite, Copper, Conichalcite, Clinoclase, Chrysocolla, Chalcopyrite, Chalcopyrite, Chalcophyllite, Chalcocite, and Calcite. Information in this paragraph came from an article by Arnold G. Hampson (1993).

During my little expedition in the latest 1970's (maybe earliest 1980's??) I was able to collect numerous representatives of copper minerals; however, after several house moves and "give-aways"—I have three remaining specimens. Fortunately I was able to keep one cluster or rosette and one "blueberry" of azurite and one small mass of malachite. The most unique of the specimens collected at the Blue Crystal Mine, then and now, are the "blueberries", small (up to 5mm) concretions, often hollow, of microsized azurite crystals; some contain tiny rounded quartz grains mixed with azurite (Fig. 10). I have not been able to locate information on their formation; however, it appears that tens of thousands of these "blueberries" have been collected over the decades. Rockhounds in Utah tell me that the mine is the single world source for these unique specimens; however, I have seen similar/almost identical specimens from the El Chino Mine in New Mexico.



Fig.10. Azurite crystal cluster left (3 x 2.6 cm) from Blue Grotto Prospect, La Sal/Lisbon Valley District. Photo courtesy of Kevin Conroy. Azurite blueberries, right. Photo courtesy of Blue Crystal Mine.

Picks & Pans 50 Year Member Honored

by Ray Berry

Roy Wilson was an honored guest at the CSMS Annual Installation and 75th Anniversary Banquet of CSMS on January 20th at the Best Western Hotel North. Elsewhere in this issue is a picture of Roy preparing to cut the Anniversary cake with a genuine Bowdil miner's pick! Roy has been a member since 1960, though few of today's members know him. Now in his 90th year, the usual vagaries of age, have kept him and his wife, Lillian, from being active in the club.

I first met Roy and Lillian when I joined the society in 1970. The meeting venue was then in the First Christian Church on North Tejon Street. In 1971 he was elected Member-at-Large, and was always helpful to new members. Roy was born in Texas and in spite of that he is a quiet, unassuming, and friendly person (just in fun, Texans!!), always willing to volunteer at shows and meetings. As a professional electrician he was always called upon to help solving lighting problems at these events.

Roy and Lillian were original members of the Camera Club satellite group. This group held their own field trips, with a fall picnic, often a trip over one of Colorado's superb mountain passes in 4WD vehicles with many stops for photographs. When Eloise and I joined the Camera Club, we were invited to go along on their many digging trips. I recall one such trip to a hill they called "The Garden Patch", now Joe Dorris's Quibuck #5 Claim, when he found a very unusual specimen.

Roy always spent much time wandering around the area checking out old digs. On this trip he came back where the rest of us were working, and showed us his find, an exceptionally clear prismatic barite crystal about an inch and a quarter long, that was on a dump. That is the only <u>clear</u> barite I have ever seen from The Pikes Peak pegmatites! On another of these trips, we were approached by a stranger who told us he had just filed claim to this area. It turned out to be Jack Buckner, and Roy was acquainted with him. After some introductions all around he agreed that we could continue to dig there. Jack became a good friend of mine and it was he who made it possible for me to get permission to the Hayman burn after the fire! Once again it is sometimes knowing the right person that really helps!

Roy grew up in this area, having lived on a ranch just off the old highway from Larkspur to Palmer Lake. Few today have an idea of what life was like in the 1920's and 30's in the Pikes Peak area. On one trip to the Lake George area some years ago, Roy accompanied me. As we left Divide going into the canon to Florissant, he remarked that his first trips on this road were much different. At that time the road followed the old Midland Railroad just after it was abandoned. The road was dirt over the railroad ties and over all the trestles crossing the stream numerous times. It was narrow and rough, taking much longer that today!

While not a Charter member, Roy certainly knew many of those old members, and recalls many of them. As a link to the past of this organization, Roy is a valuable source of history for those of us fortunate to talk with him! I hope you have an opportunity!

The Colorado Springs Mineralogical Society 2011 – Our 75th Anniversary

Year by Ron "Yam" Yamiolkoski

Over the years during occasional talks by our Lifetime Members like Ray Berry we have heard a bit about those early members of CSMS who had the forethought to establish our club. They certainly were a dedicated group of gifted individuals who not only were significant in forming our club but other groups as well. They were leaders in the early years of mineralogy and rockhounding. Names like Richard Pearl are known by "rockhounders" throughout the country. We should be proud to claim them as early members of CSMS.

But how did it all start for CSMS? Let's go back about 75 years and visit the meetings from the very first meeting. In case you were wondering, I found the following in a folder labeled "Colored Maps". The folder did have some colored maps in it, but it also included copies of the secretary's minutes from the early years of CSMS. Anyway here are the minutes from the very first meeting of CSMS:

"Nov. 24, 1936

On November the twenty fourth, 1936, a group of individuals was invited to the home of Dr. E. L. Timmons for the purpose of organizing a mineralogical society. Present on this occasion were the following: Mr. Lazard Cahn, Mrs. Edward L. Kernochan, Miss Billie Bennett, Dr. E. L. Timmons, Mr. O. A. Reese, Mr. R. D. Wilfrey, Mr. Willard Wulff, Mr. H. E. Mathias, Mr. George White, Mr. Leonard Sutton, Mr. Ralph Monell, Mr. William R. Willis, and Mr. Cecil Graves. To this list of prospective members the names of the following absent but interested individuals were added: Mr. William Davis, Mr. Sigfrid Gross, Mr. Arthur Roe, Mr. Frank Young, and Mr. Edwin Over, these to be included among the charter members. Mr. Graves acted as temporary chairman and received nominations for the office of President. Mr. Lazard Cahn was unanimously

elected as permanent, honorary President, and Mr. Willett R. Willis was made President. Mr. Willis took the chair and received nominations for the offices of Vice-president and Secretary-treasurer. Dr. E. L. Timmons was elected Vice-president and Mr. Graves was made Secretary-treasurer. The officers having been elected the business meeting was adjourned and we spent two profitable and enjoyable hours seeing too few microscopic crystal mounts in the Timmons-Schernicho Collection. Delicious refreshments were served at the conclusion of our microscopic observations and thus came to an end the first meeting of the infant organization, too young as yet to have been named.

Respectfully submitted,

Cecil H. Graves, Secretary-treasurer"

CSMS Goes "Bloggy" by Mike Nelson

CSMS Board members: after getting the OK from Roger at the banquet, I have started the CSMS blog: CSMS GEOLOGY POST. It is a modest beginning with only a couple of posts thus far but I hope to do at least one per week. I also view this as a location where the Board might want to post notices, for example, a recently scheduled field trip, or an

invitation to a banquet, etc. Just send me whatever you want posted and I will do the other work. Hopefully this little offering will continue to put CSMS further out in front of the pack. The Colorado Springs Mineralogical Society has joined the "blogosphere"! The blog, authored by Mike Nelson,

may be found at <u>http://csmsgeologypost.blogspot.com</u>.

Sad Passings

From John Rakowski: Long-term Lake George Club member Mary O'Donnell died on De-2010, at her brother's home in the urb of Lake Villa. Mary was instrumental in the growth of the Lake George Club, being essentially a founding member. She was also a past editor of the Pick & Pack. Her smile and "can-do" attitude will be missed by everyone who knew her. Her public service was held at the Cresson Cafetorium on January 29, 2011.

From Marilyn Krummel: I am so sad to tell you that my husband, Ross Krummel passed away Monday, February 21, 2011. After experiencing some mild chest pain then a weak feeling in his arms, we called 911. Paramedics and the fire department were here within 4 minutes. The doctor at Penrose St. Francis seemed to think he had a massive heart attack. Due to his "relatively" young age and good physical condition they perfomed an autopsy. We will most likely have a memorial service sometime this weekend or early next week. I will let you know when the plans have been finalized.

Continued from Page 3

The "azure colored" rosettes and crystal clusters "commonly occur as 3-8 cm rosettes of subparallel crystals and as individual crystals to 2.5 cm in length" (Hampson, 1993) (Fig. 10). The blueberries are much lighter in color, perhaps a sky blue.

Azurite has been used as a dye and/or paint pigment for centuries; hence, several thousand pounds from the Big Indian area being shipped to Japan (see above). At a hardness of 3.5 -4.0 azurite is somewhat too soft for certain jewelry pieces such as rings. However, I have seen nice stones in pendants but the wearer must use extreme caution against "banging it around". Some Native American cultures regard azurite as sacred. In my opinion, since azurite is such a stunning mineral the best use is as a specimen in the collecting case! However, I have noticed that some spiritualists believe azurite may be used to expand the mind, fortify the memory, and clear stress---now that is a real stone for the baby boomers and I may go into business stimulating memories.

So, that is the story of how a bunch of broken chemistry glassware led a directionless and drifting young man to collect azurite blueberries in a Colorado Plateau laccolithic center.

It was my good fortune in 1935 to be assigned chief of a U.S. Geological Survey field party studying and mapping the geology of the Henry Mountains, Utah. Geologically the area is of great interest because of the classic work done there in 1876 by G.K. Gilbert for the Powell Survey. In the 1930's the area still was frontier—a long distance from railroads, paved roads, telephones, stores, or medical services. It was the heart of an area the size of New York State without a railroad, and a third of that area was without any kind of a road. This was not Marlboro country; it was Bull Durham country. The geological work had to be done by pack train; it was about the last of the big packtrain surveys in the West—the end of an era. Charles B. Hunt

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WMMI HAPPENINGS

225 Northgate Blvd. Colorado Springs, CO 80921

ngs, CO 0.752.6558

Main: 719.488.0880 Toll Free: 800.752.6558

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.

March Mining Movie Madness

Wednesdays in March 7:00 p.m.

You're invited to the Western Museum of Mining & Industry's March Mining Movie Madness. At 7:00 P.M. on March 2nd, 16th and 30th a movie of the night will be featured. We will be featuring old classics and newer favorites, with actors such as Clint Eastwood, Sean Connery and Sissy Spacek. Check our website at <u>www.wmmi.org</u> to see which movie will be playing each night with a brief synopsis of the movie. Hot beverages will be provided. \$3.00 admission per person to help support the museum.

Family Exploration Day

Saturday, March 12 10:00 a.m.- 3:00 p.m.

The Legendary Ladies with be portraying famous individuals of mining history at 11:00 and 1:30. The Association of Women Geoscientists will have hands on activities for all ages. There will also be a high tea. Included with paid admission. To reserve your spot, call 719-488-0880 or e-mail rsvp@wmmi.org.

Spring Break with the Burros

Friday, March 25 9:00 a.m. - 4:00 p.m.

Tour the Museum to learn about life in the 1880's at 10:00 a.m. and 1:00 p.m., afterwards meet and greet our burro mascots Oro & Nugget. Learn what makes a donkey "pink" and the important role burros played in our mining history. Use your imagination and venture to a time of limited technology but tons of creativ-ity! Picnic grounds are available, and there are over 27-acres to explore!

Senior Mondays

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

Last month, Seniors age 60+ admitted to the museum for just \$2.50 (reg. \$6) every Monday. Museum tours begin at 10:00 a.m. & 1:00 p.m. Group tours are available upon request. For more information contact us at 719-488-0880 or <u>info@wmmi.org</u> Admission: \$8 adults, \$7 Military/AAA, \$6 Seniors & Students, \$4 Children 3-12, Free to Children under 3 & Museum Members.

Location: WMMI is off I-25 at the Gleneagle exit, #156A across from the north entrance to the United States Air Force Academy.

THINGS TO DO FROM CSMS MEMBER PETE MODRESKI

Feb. 25-27, Denver Gem and Mineral Guild, Jewelry Gem & Mineral Show; Jefferson County Fairgrounds, 15200 W. 6th Ave. (Frontage Road), Golden, CO; 10-6 Fri., 10-6 Sat., 11-5 Sun.; "Free Parking and Free Admission". See <u>http://denvergem.org/Shows.html</u> for more info.

Tues, Mar. 8, 10:30 a.m., USGS Rocky Mountain Area Seminar Series, Last interglacial sea level and global warming: a lesson for the future?, by Dan Muhs, USGS Denver. Building 25 Lecture Hall, Denver Federal Center. Globe at Night 2011: Feb. 21 - Mar. 6 and Mar. 22 -Apr. 4 "GLOBE at Night is an annual citizen-science campaign that encourages people all over the world to record the brightness of their night sky. For two weeks every March, when the Moon is not out during the early evening and the constellation of Orion can be seen by everyone everywhere, children and adults match the appearance of Orion with 7 star maps of progressively fainter stars found on the website, www.globeatnight.org. They then submit their measurements (e.g., which star map they chose) on-line with their date, time and location. This year the GLOBE at Night 2010 campaign (which took place March 3-16) set a record high of over 17,800 measurements from people in 86 countries."

Mar. 25-27, Fort Collins Rockhounds Club Gem and Mineral Show at The Ranch in the Thomas M. McKee 4-H building, Larimer County Fairgrounds, 5280 Arena Circle, Loveland [new location for just this year; normally in downtown Fort Collins]. For more info see <u>http://</u> www.fortcollinsrockhounds.org/ gemAndMineralShow.shtml.

April 22-24, Colorado Mineral and Fossil Spring Show, Holiday Inn-Denver Central, 4849 Bannock St, Denver, CO 80216; free admission and parking. For more info see <u>http://www.mzexpos.com/colorado_spring.htm</u> A last P.S., just "FYI", have you seen this video about a 100-ounce gold nugget recently found in California? <u>http://geology.com/news/2011/giant-gold-nugget-the-100-</u> ounce-washington-nugget.shtml?

utm source=feedburner&utm medium=email&utm cam

paign=Feed%3A+Geologycom+%28Geology.com%29

CoCoRaHS, Community Collaborative Rain, Hail &

Snow Network: all year; http://www.cocorahs.org/ "CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web-site, our aim is to provide the highest quality data for natural resource, education and research applications. It's easy to join, takes only five minutes a day and is a fun way to learn about this wonderful natural resource that falls from the sky. We are striving to have 30,000-40,000 active observers by the end of 2013. COCORAHS is now in all 50 states (as well as the District of Columbia)!" Participants must register and order a high-capacity (4" diameter) rain gauge, which they will read and submit data from at approximately 7 a.m. each day. The CoCoRaHS website is a great source for daily measurements of local rainfall and snowfall in each community within your state or around the country; anyone can log in and access the daily data. [Let me put in an extra plug for this project; I participate, and it's a GREAT community effort! Please also check out their 2011 Rain Gauge Calendars-you can help the project by ordering one.]

Colorado RiverWatch: all year <u>http://</u>wildlife.state.co.us/landwater/riverwatch/

A program that, "...started with six schools on the Yampa and grew to cover all watersheds in Colorado and 350 schools. Since 1989 we have involved over 60,000 individuals in Colorado, provided data on 3,000 stations covering over 300 rivers. We have also grown to include individuals, watershed groups and other entities, besides schools, in our program. River Watch is a statewide volunteer water quality-monitoring program operated by the non profit 501@3 Colorado Watershed Assembly in cooperation with the Colorado Division of Wildlife (CDOW). Our mission is to work with voluntary stewards to monitor water quality and other indicators of watershed health and utilize this high quality data to educate citizens and inform decision makers about the condition of Colorado's waters. Volunteers agree to monitor on a monthly basis. Samples are collected which the volunteers analyze for hardness, alkalinity, dissolved oxygen, pH and temperature. Additional samples are collected to be analyzed for total and dissolved metals..." Volunteers must register, receive training and equipment, and agree to conduct regular water monitoring in a selected local stream. All the data collected and archived are publicly accessible via their website.

Project BudBurst: springtime (and fall too); <u>http://</u><u>neoninc.org/budburst/</u>

Anyone can participate. Familiarize yourself with certain native plants from a list of those growing in your geographic area, then observe and report dates you observe for first leafing or flowering of these plants. "Project Bud-Burst has targeted 97 native trees, shrubs, wildflowers, and grasses for you to monitor throughout the year! With your help, we will be compiling valuable environmental information that can be compared to historical records. By recording the timing of the leafing and flowering of native species each year, scientists can learn about the prevailing climatic characteristics in a region over time."

Pebble Pup Honored by Steven Veatch

Greetings! Last night (January 12, 2011) I was invited to attend the District 11 Board of Education meeting where one of the CSMS Pebble Pups was honored for his achievements in Earth science. The room was packed with educators, administrators, and various politicians. I went up front with the Pebble Pup and his mother. The Superintendent read a lengthy citation of what the Pebble Pup achieved, and presented him with a beautiful certificate of accomplishment from the board. The District 11 public information officer took pictures of the event while we were up front. The boy's mother then gave me a big HUG. What a night!! I believe this demonstrates the power and **VALUE of informal education**. This is also I night I will never forget!

I am continuing to focus on the Lake George Club and expect an enormous amount of commotion when the Egyptian artifact paper is published by the magazine. Please look at the December 12th entry on the pebble pup blog: <u>http://pebblepups.blogspot.com/</u>

This boy is in the 5th grade and wrote this paper as an exercise, using in-line citations. He is one of my distance Pebble Pups who lives in Denver. Although I have never met him, he participates with the CSMS Pups via the Internet. I combined the Lake George Pebble Pups and the CSMS Pebble Pups last Saturday on field trip to the Western Museum of Mining and Industry. I mixed it up with the Pups from 10 am until noon. We panned gold (a big hit) and explored the museum. The Florissant Fossil Beds provided me with excellent compasses and magnifying glasses. I made each Pebble Pup (48 of them, some from Denver) answer a question to get both of these items. Many of the kids continued to stay---some until the end at 3 pm.

I am so fortunate to be able to work with the Pebble Pups and all the adults that help me make this stuff happen.





Colorado Springs Mineralogical Society Second Annual Silent Auction & Bake Sale April 23, 2011 10 a.m. to 2 p.m. At the WMMI 225 North Gate Blvd. (I-25 Exit 156A) Colorado Springs, CO

Lots of fun for the entire family! We will have an assortment of mineral specimens, slabs for lapidary work, fossils, and finished pieces for folks to bid on. There will also be some special items of interest to capture your attention and earn a bid. Club members will be donating an assortment of homemade goodies to purchase. Come see the Museum, have fun bidding on favorite items, and take home a few goodies to eat later.

Admission: Standard WMMI Admissions apply. CSMS members and other WMMI supporting clubs admitted free.

2011 RMFMS Convention & Show In Colorado Springs

By: Ronald "Yam" Yamiolkoski, Show Chair

I bet that we are all beginning to think about next year and making our plans to attend various shows and participate in certain field trips. I hope that your plans will include coming to Colorado and joining the Colorado Springs Mineralogical Society as it celebrates its 75th Anniversary with all of the Rocky Mountain Federation. I should add that it will also be the 70th Anniversary of the Rocky Mountain Federation of Mineralogical Societies. So what better place to party and enjoy our hobby?

As Chair of the Event I have been working for several months in planning this event. It will be unique in many ways and will still include many of the things that make for a great RMFMS Convention. Probably the first thing I should mention is that it will actually be two Shows. The outdoor show is the 3rd Annual Rock Fair at WMMI and will be held at the Western Museum of Mining and Industry at 225 North gate Blvd., Colorado Springs, CO. Our indoor show will be the 48th Annual Pikes Peak Gem & Mineral Show and will be held at the Best Western Academy Hotel at 8110 North

Academy Blvd., Colorado Springs, CO., and the site of the RMFMS Annual Convention. Using these two venues we will provide an opportunity for all attendees to see a variety of materials provided by our vendors.

One of the things that will add greatly to the event will be the speakers that we have planned for both venues. Our theme for the event is Colorado's Mining Heritage. We plan to have two speakers at the Convention Hotel addressing this theme in addition to our Banquet Speaker. At the Rock Fair we will have several talks presented on a variety of subjects related to our hobby that are designed for all levels of attendees. These talks and speeches will add to the educational value.

Of course there will be cases. We will utilize both facilities to display cases submitted. The competitive cases will be displayed at the Convention Hotel and the non-competitive cases will be displayed at the western Museum of Mining and Industry. All judging will take place at the Convention Hotel. As usual Club cases will be available for those making prior arrangements.

The Rock Fair will also include some additional fun activities. Our friends, the Gold Prospectors of Colorado will be teaching both children and adults how to pan for gold. We will have our kid's area all set up and will be providing the youngsters with materials to help them start there collections. Like last year, the Rock Fair will also be the site of our Silent Auction. The Silent Auction benefits the Colorado Springs Mineralogical Society Scholarship programs and provides a great opportunity to add to your collections.

Another part of a great show are the Field Trips. We are planning a total of at least seven field trips. Four will be before the Convention and Shows and three will be done after the Shows. This should allow you all to plan your visit in such a way as to maximize your opportunity to enjoy the formal part of the show and do some collecting. We will give first opportunity to participate in the Field Trips to the attendees of the RMFMS Convention but it will be important to register early because many of the trips will have limits on the number of participants.

So you can mark your calendars: the first Field Trip will be on Sunday, June 19th, the RMFMS Convention, the Rock Fair and the Pikes Peak Gem & Mineral Show will start on Friday, June 24th and close on Sunday June 26th, followed by the final three days of Field Trips.

Obviously, more details will be made available shortly and posted on the RMFMS website and the Colorado Springs Mineralogical Societies website (www.csms.us).

We hope that many you will be able to join us in Colorado Springs to help us celebrate our 75th Anniversary and the 70 Anniversary of the Rocky Mountain Federation of Mineralogical Societies.

PRESIDENT'S CORNER

by Roger Pittman, CSMS

It's February of 2011 and I find myself your new president. Some of you know me, and many do not, so I thought that I would introduce myself.

I joined the CSMS in 1988. I have served as Member-at-Large, Secretary, Vice President and President. I headed the Camera Club satellite group for a long time. I was an officer in the Rocky Mountain Federation of Mineralogical Societies for many years. The Lapidary Group met at our home when it first formed until they found a more central location. I enjoy crystal collecting the most, but will collect nearly anything hobby related.

I believe our Club's highest priority for the coming year should be to follow through on our commitment to host the RMFMS convention and show, and to make it a memorable event for our friends in the Rocky Mountain district. This can only happen if we all pitch in to help with the show. You do not need to slave for months as long as you help where you are most able. There are many positions where you may only need to volunteer for a couple of hours. Please remember we are all volunteers and let's not burn out the people who have already committed to take on areas of our show. Our Past President, Yam, has agreed to continue on as Show Chairman and he will need tons of help. I thank Yam for his service as President and Show Chair. Let's all pitch in and make this work!

Thanks!

Roger

CSMS FOSSIL GROUP

The CSMS Fossil Group met for the initial 2011 meeting on 4 January at the Senior Center; all meetings are the first Tuesday of the month at 7:00 pm. Steve Veatch described new finds at the Florissant Fossil Beds National Monument, including the discovery of a high altitude partial mammoth tooth with associated palynomorphs. The next meeting on 1 February will feature presenter Jerry Suchan, a long time CSMS member. On 1 March Jack Null will present an update on the Glen Eyrie fossils with an overview of the Fountain Formation near Colorado Springs. At a time later in the spring Jack will lead a CSMS field trip to Queens Canyon in order to examine Glen Eyrie fossils "in-place". Questions or comments about the Fossil Group may be sent to Mike Nelson at <u>csrockguy@vahoo.com</u>.

Hayward's Annual Sale!

Bill Hayward's Annual Crystal and Mineral Sale will be held Saturday and Sunday, March 19th & 20th, from 10 a.m.-5 p.m. both days, at 3286 Quitman Street in Denver, CO 80212. For more information, call 303.455.1977.

RMFMS PRESIDENT'S LETTER

BY BILL SMITH, RMFMS

I hope everyone had a great Thanksgiving. I sure had many things to be thankful for this past year. God has been very kind and generous to us: at 95, Janet's mom is still with us and very active; we had two Thanksgiving gatherings, one at noon and another in the evening;

and have made many new friends, especially in our Federation. Many of you have volunteered to take committee positions which will continue to make our Federation an outstanding hobby organization.



Janet and I are leaving the 5th for the Caribbean and will be gone most of December, so will miss most of the Club's Christmas parties. We will be thinking about you as we suffer through the heat. We do hope to make it to North Central Kansas Rock and Gem Club's second anniversary Christmas on the 28th.

It is time to start thinking about next year, and making plans to participate in the combined Colorado Springs Mineralogical Society/RMFMS show in June. It is going to be a wonderful show with super field trips. Has your club thought about hosting an RMFMS show? We have none scheduled after 2011. I know many of you could just make the addition to your regular show. Do you have any big field trips planned? This is a wonderful way to take a short vacation.

Must get packed and head south. Have a very Merry Christmas and a Happy New Year.

Bill







This is a continuation on the "Baker's Dozen" from the December 2010 Pick & Pack:

In the December 2010 issue of the Pick & Pack I partially answered a question submitted by John about the dozen best publications **to better understand the geology, minerals and fossils found in Colorado**. I reviewed my personal list of 1 through 6 as: 1 and 2) Messages *in Stone: Colorado's Colorful Geology* and *Minerals of Colorado*; 3) the *Geologic Map of Colorado*; 4) *Cretaceous Facies, Faunas, and Paleoenvironments Across the Western Interior Basin* found in the Cretaceous Facies, Faunas, and Paleoenvironments Across the Western Interior Basin; 5) a mineral and gem identification book such as Simon and Schuster's *Guide to Rocks and Minerals* (Martin Printz, Ed.); 6) a fossil identification book such as *Invertebrate Fossils* by R. C. Moore, C. G. Lalicker, and A. G. Fischer. This current article describes the remainder of my personal picks.

Coming is at numbers 7 and 8 are good college textbooks describing important geological concepts, books that are used in introductory physical and historical geology classes. Now, publishers really inflate (my opinion) the prices of college textbooks so that new copies usually cost over \$100 per book. That price is out of my range so the solution is to purchase previous editions from used book booksellers. I have found that these older editions are just fine for readers to better understand geological concepts and history.

Physical geology is the introductory course completed by every geology major in U. S. institutions of higher learning. Most textbooks are quite similar in that chapters cover rocks and minerals, environments that produce such rocks (such as volcanism), geologic time, different geologic environments (deserts, glaciations, etc.), plate tectonics, earthquakes, mountain building, and other physical processes. The course is usually a combination of lecture and several hours of laboratory each week. The labs require a separate text/manual and completion of the lab exercises is a great learning experience.

Virtually any text on the market would be worth reading; however, I am somewhat partial to *Earth: An Introduction to Physical Geology* by Tarbucks, Lutgens, and Tasa with the 2010 edition available for \$131. BUT, the 2007 edition (9th) is available from internet book sellers for \$4 with the 2002 edition available for \$.01! *Physical Geology: Earth Revealed* by Carlson and Plummer is available for \$116 while older editions are much less in price.

Historical geology is usually the second course required for geology majors and is one that I taught every spring semester. This course explores the geological and paleontological history of planet earth. The laboratories concentrate on the interpretation of geologic maps and the identification of fossils. There are several texts on the market with *Historical Geology* by Wicander and Moore perhaps a leader (new copies at \$135 but earlier editions available for less than \$10). Another book that I really like is the 2003 edition of *The Earth Through Time* by Harold Levin available for less than \$5 (used 2009 edition at \$69). Historical geology texts make for great recreational reading and help all readers better understand geological history.

Selection number 9 is one that I carry at all times during my travels: *Roadside Geology of Colorado* (Chronic and Williams; Mountain Press Publishing; 2002; new at \$16, used much less). The authors have described the general geology along most of the major highways in Colorado. The guide contains good geologic cross-sections and several nice photos. Some highway mile posts are noted; however, I would prefer to see additional postings in a revised and newer edition. This is a great book for every traveler and I would strongly recommend it for personal libraries.

Pick number 10 on my list is one of the hiking books that explore Colorado geology when the reader is traveling "on foot". However, even if you are not a hiker the books help one better understand our wonderful geological scenery. Two books that I really like, so take your pick, are *Rocks Above the Clouds* by Reed and Ellis (The Colorado Mountain Club Press; 2009; \$13) and *Hiking Colorado's Geology* by Hopkins and Hopkins (The Mountaineers; 2000; \$17). The latter book describes the geological features found along 50 hikes, ranging from "easy" (Garden of the Gods) to strenuous (Mt. Elbert at 14,433 feet). All hikes are to areas of geological interest and the book provides explanations for readers of all abilities.

I prefer the former book; subtitle *A Hiker's and Climber's Guide to Colorado Mountain Geology*, since it concentrates on the high mountains of Colorado. The geological descriptions of the various mountain ranges are well stated and each of the state's 14ers is noted in detail. The book is small (pocket book size) and well suited for a backpack, but finds room to contain both geological and terrain maps. My copy is well used as I take it on every trip to the high country.

There are essentially four mineral/rock collecting guides to Colorado and one comes in as Pick number 11. The oldest guide, and in many ways the best, is *Colorado Gem Trails and Mineral Guide* by Richard Pear. First published in 1958, the book is very impressive for its detailed descriptions of "how to find the locality". I have the 1972 edition purchased at \$15 but used copies are widely available from internet book sellers.

Falcon Publishing (AFalconGuide) has a number of guidebooks on the market and one is *Rockhounding Colorado* (Kapple and Kapple; 2004; \$10 new). I found this to be of less interest than Pearl's book since few "exotic" sites are explored and many mineral collecting sites are for common feldspar, mica, etc. This book might be a better choice for the Pebble Pubs.

James Mitchell has written a number of state collecting guides and rockhound books and I have copies of each. In the Colorado version (*Gem Trails of Colorado*) he has included good maps for the localities (75) but the book could be greatly improved with some descriptions of the local geology. New copies of the 1997 edition (Gem Guides Book Co.) are being sold for less than \$5.

By far the most extensive of the collecting guides is *Colorado Rockhounding* by noted Colorado author Stephen Voynick. I like the fact that localities are grouped together by counties and that each locality is referenced. This is the book that I would purchase if only "one" guide is destined for your collection. New copies are \$16 with used books widely available (some at \$1). I believe the latest edition is 1996 so some items seem rather dated. Perhaps a new and revised edition is on the way?

Whatever guide one chooses please remember that: 1) several described localities are on private land and permission is needed to collect; 2) several localities might be under claim; 3) all vertebrate fossils, and some invertebrates,

are protected if they are on federal lands; Continued on Page 4) collecting on state-owned lands (and 11

city and county) is often offlimits so make certain to check with appropriate management

agencies; and 5) collecting localities described in guides are often "cleaned out" within a few years.

And, that brings us to number 12—a readers choice! *Geology of Colorado Illustrated* (Foutz; personally published; 1994) describes the geology of Colorado from a locational perspective. That is, geologic descriptions of major features, such The Denver Basin, The Grand Mesa, The Dinosaur Corner, etc., are described. Each location has a generalized geologic map and several photographs. However, the photos are in black and white and it is sometimes difficult to see details. With a publication date of 1994/1999 the book is getting somewhat outdated. New copies list at \$18 with used at \$6 or less.

Personally, I like *Guide to the Geology of Colorado* (Taylor; Cataract Lode Mining Company; 1999), a book that is well written and used by both serious students of geology and recreational rockhounders. Profusely illustrated with color photographs and printed on glossy paper, the book tackles the geologic time scale and then describes the geology of numerous localities of interest. New copies (perhaps not currently available) come packaged with a general geological map of Colorado. Used copies are available for \$16.

Since I promised a Baker's Dozen of books, pick number 13 is a wildcard, but one that I have read several times: *Ancient Landscapes of the Colorado Plateau* (Blakey and Ranney; Grand Canyon Association; 2008). The authors present wonderful colored paleogeographic maps that center on the four corners region, including western and southwestern Colorado. The historical geology of the region is well explained in a manner understood by all readers and the maps help explain the total geological history. Several color photographs also grace the volume. New from ~\$32 with some used copies available for \$25.

So, there you have it—my pick of the geology books that readers might want to include in their personal library. Did I leave out someone's personal favorite, probably? Could the list be rearranged, certainly? Could I add to the list, you bet. The prices listed are very general in nature but are quoted from numerous internet book sellers including Barnes and Nobel, Amazon, Abe Books, and Powell's Book. These latter two sellers have wonderful inventories of used geology books and I frequent their sites. And, I remind readers that these choices and suggestions are mine alone and do not represent any product endorsement by CSMS.

I might also note that the geological literature of Colorado numbers in the thousands, probably over 10,000 citations (or even more). Many of these are very site-or time-specific and are published in a variety of professional journals. The U.S. Geological Survey (www.usge.gov) produces a variety of publications including the popular Professional Papers and Bulletins as well as thousands of geological maps. Locally the Colorado Geological Survey (www.geosurvey.state.co.us) has a variety of geological publications plus their geological maps. And the list goes on and on and on. But, we live in a community (if from Colorado Springs) that has two wonderful libraries-The Pikes Peak Library District (www.library.ppld.org) and the Tutt Library at Colorado College (www.coloradocollege.edu). Both of these institutions have a great selection of geology themed books and maps and the Tutt Library (a federal repository so it receives all USGS publications) subscribes to a wide variety of professional earth science journals. I spend several tens of hours each year perusing the offerings. And, CSMS has a library in which members may contact the librarian (rp_colorado@hotmail.com) and the book will be delivered to the next CSMS meeting.

Books are a passion of mine; however, the editor appreciates some brevity so I had to restrict my list! As a final note, I encourage readers to suggest books of their choosing and submit such to the Pick & Pack editor—service with a smile.

Books serve to show a man that those original thoughts of his aren't very new after all. Abraham Lincoln

FROM THE LIBRARY by Joni Peterman, CSMS

While Frank and Ellie are on the adventure of a life time to the land down-under, Joni Peterman is staffing the CSMS library. Remember this is your library, so CSMS members take advantage of the extensive learning resource data available.

Be sure to look at CSMS website to make your selection then Email Joni at <u>rp_colorado@hotmail.com</u> We greatly appreciate donations from everyone. We don't accept only books; bring in DVDs, videos, and magazines, anything relative to CSMS.

This is your library. We encourage all CSMS members to take advantage of our fairly extensive inventory of reading material. Check the CSMS website to make your selection then Email or call Frank or Ellie to make your request. We appreciate all mineralogical book donations.



CSMS FIELD TRIPS

Field Trips for 2010 have already come and gone—were you able to participate? As usual, check the CSMS website (<u>www.csms.us</u>) for the latest list of Field Trips. Also, if you have an idea about a field trip or would like to lead a field trip, contact Yam our Field Trip Chair at <u>ron.yamiolkoski@aecom.com</u>. We are looking for ideas and leaders for the 2011 Field Trip Season!

THE GEOLOGY AND GLOBAL POLITICS OF RARE EARTHS: WHY OUR HIGH TECH LIFE-STYLE IS UNDER PRESSURE

By Andy Weinzapfel <u>acwein@gmail.com</u>

Remember that old periodic table from high school? Rare earths elements (RREs) include the entire lanthanide group plus yttrium, shown in orange. Scandium is sometimes included. These elements have similar chemical properties and therefore tend to occur together in nature. They have one other thing in common: difficult- to- pronounce names!



REE Periodic Table: The Rare Earth Elements are the 15 lanthanide series elements, plus yttrium. Scandium is found in most rare earth element deposits and is sometimes classified as a rare earth element. Image by Geology.com.

The term "rare earth" is a misnomer, because most RREs are generally not that rare. The estimated average concentration in the Earth's crust ranges from about 150-220 parts per million, exceeding that of many metals commonly mined, like copper (55 parts per million) and zinc (70 parts per million) The problem is there are few geologic processes that concentrate RREs, unlike most other elements. This has major economic consequences, addressed later.

RRE ores are characterized as either "light", dominated by cerium, or "heavy", dominated by yttrium. Some wellknown minerals that contain cerium and other light REEs include bastnaesite, monazite, allanite, lanthanite, cerite, and fluocerite. Well-known minerals that contain yttrium and other heavy RREs include gadolinite, xenotime, samarskite, euxenite, fergusonite, and yttrofluorite. The smaller ionic size of the yttrium group elements allows greater solubility in rock-forming minerals, and thus yttrium and the heavy RREs show less enrichment in the Earth's crust than do cerium and the light RREs. This has economic implications: large ore bodies of the cerium light RREs are more common, while those of yttrium and heavy RREs tend to be rarer, smaller, and less concentrated. Modern research into the diverse nuclear, metallurgical, electrical, magnetic, optical, and catalytic properties of RREs has been opening up new cutting edge applications.

The lapidary world has used cerium oxide as a polishing agent for many decades. Perhaps the most notable use of rare earth oxides for polishing is on the Hubble Space Telescope mirror. YAG, synthetic yttrium aluminum garnet, was once common in jewelry, replaced for the most part today by cubic zirconia.

The earliest color TV sets had poor quality red, until europium as a phosphor dopant was introduced. RREs mixed with tungsten improve high temperature properties for welding. Various RREs are used in high refractive index lenses, catalysts for oil refineries and selfcleaning ovens, positron emission tomography (PET scan), and wind turbines. Virtually everything in the kitchen-including microwave and coffeemaker-uses RREs. RREs are critical to iPhones, MP3 players, high temperature superconductors, lasers, hybrid car components (especially batteries and motors), and optical-fiber communication systems. Many defense-related products use RREs, including night vision goggles, rangefinders, and smart bomb guidance systems. A motor made with neodymium-iron-boron magnets is far more powerful than one made with iron magnets. One of the more interesting inventions is magnetic refrigeration and heating. Air conditioners which use RRE magnets consume 1/10th the electricity of standard systems, with the added benefit of fewer moving parts to break down.

Geology and Geographic Distribution of Rare Earths

Even after 4.5 billion years of earth history processes, natural geologic separation of RREs has been extremely poor relative to almost all other elements we consume. Even though RREs disseminated in the earth's crust are not uncommon, *economic* rare earth deposits of sufficient grade are indeed rare. The below illustration, from the USGS, shows the historic production of RREs over a 50 year period:



From 1950-65, monazite, derived from veins and placers in South Africa, India, Madagascar, and Brazil, was the

RRE Applications

While a few uses for RREs are mundane, most are exotic.

primary rare earth ore. The chief RRE in monazite is cerium. Monazite is radioactive because of the presence of thorium.

In 1949, the most important RRE discovery located in the USA was made by accident, when two prospectors in the Mojave Desert of California, using a borrowed Geiger counter, located a radioactive outcrop they thought contained uranium. Samples sent to the USGS found instead a "worthless" rare earth fluorocarbonate mineral, bastnaesite. Intrigued, the USGS conducted field investigations which uncovered a 1.4 billion year old carbonatite intrusion containing light RREs. Carbonatites are unusual alkaline intrusive rocks composed predominately of calcite and dolomite. Globally, they often have higher levels of RREs and other unusual elements than average rocks. From 1965 through the mid 1980s, the USA was virtually self-sufficient in RREs because of output from the Mountain Pass mine. However, there were environmental problems with ruptures of a wastewater pipeline, spilling thorium -laced radioactive water, derived from bastnaesite. The mine was closed in the 1990s in response to both environmental restrictions and lower global prices for REEs, although processing of previously mined ore continued at the site. There are bold new plans for this deposit, discussed below.

The green area on the chart above addresses the production of RREs from Inner Mongolia, China, beginning around 1985 and surging afterwards. China, a low cost producer, literally shut down RRE mines elsewhere by exporting cheap product. Today, China produces about 95-97% of all REEs consumed, from a poorly understood geologic ore type known as lateritic iron-absorption clays. In tropical environments, rocks are deeply weathered to form iron-aluminum rich soil profiles as much as many tens of meters thick. These soils commonly concentrate heavy minerals, leached from previously exposed rock, as residual deposits. In China, RREs are concentrated sufficiently in laterites to produce economic deposits of significant size and grade. These deposits contain both light and heavy RREs.

Granitic pegmatites, very coarse grained rocks solidifying late in the history of an intrusion, also contain anomalous RREs, both light and heavy. Often these bodies are zoned, having a quartz core, with RREs concentrated outward. While many diverse RRE minerals occur in pegmatites, usually reserves are small and therefore have been of primary interest to collectors.

On-going exploration and development efforts include work in Canada, Vietnam, Greenland, Australia, and Alaska.

Geopolitics and the Future

Today global demand for RREs is straining supply. The current Chinese near-monopoly, at a time when our high

tech society is requiring more rare earths, is a big strategic concern, having national and global consequences. Furthermore, China has been gradually reducing export quotas, with the plan to continue this trend. China is thought to sell RREs to internal manufacturers for much less than export prices, in order to stimulate internal growth. They have also cracked down on smuggling of RREs. In December, 2010, they introduced new export taxes, essentially telling the rest of the world to "go find your own RREs". Japan's supply from China is especially threatened because of souring relations, and is scrambling to find rare earths elsewhere.

The Mountain Pass carbonatite deposit in California, discussed earlier, is the largest known occurrence or economic light RREs in the western hemisphere, possibly the world. The aerial photo below is from Long et al, 2010. This property, owned by Molycorp, is in the forefront with several recent developments which will impact global supply. In December, 2010, all necessary permits were secured to ramp up production from 3,000 metric tons/year rare earth oxides to 20,000 metric tons/year by 2012. Joint ventures with Sumitomo Corp and Hitachi Metals will supply capital and expertise to meet the company's "mine to magnets" stated goal. A new production facility will be built on site to manufacture neodymiumiron-boron alloys and magnets.



Figure 6. Google Earth image of the Mountain Pass mining district, California. Molycorp's open pit mine—inactive since 2002—is at the center of this view, the pit covers about 55 acres (22 hectares) and is about 400 ft (122 m) deep. (Image used with permission of Google.)

Another recent development is extraction of RREs from electronic waste. New advances in recycling technology have made extraction more feasible. Mining and refining of RRE ores have significant environmental consequences if not properly managed, due to the common association of radioactive thorium and uranium. Continued possible price escalation, coupled with growing environmental initiatives worldwide, will make recycling of RREs an important part of future supply. Nevertheless, it appears that global demand will significantly outstrip total RRE supply in a few years without major new discoveries.

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A Rock Makes an Excellent Puppy by Kenn Nesbitt

A rock makes an excellent puppy. They're practically almost the same. Except that a puppy's rambunctious; A rock is a little more tame.

It's true that a rock's not as hyper. It may not chase after a ball. And, often as not, when you call it, It won't even hear you at all.

And maybe it doesn't roll over, and isn't excited to play, but rocks always sit when you tell them, and rocks really know how to stay.

It may sleep a little bit longer. It probably eats a bit less. But rocks never pee on the carpet. You won't have to pick up their mess.

So go ask your folks for a puppy, and possibly that's what you'll get. But, still, if you can't have a puppy, a rock is a pretty good pet.

It doesn't annoy you with barking; it sits quietly on a shelf. A rock makes an excellent puppy. That's what I keep telling myself.

CSMS 75TH ANNUAL BANQUET

CSMS Officers for 2011: (please advise if I labeled this incorrectly. tls)

Rear, Left to Right: Al Zelenak, Member-at-Large; Ron "Yam" Yamiolkoski, Past President

Center, Left to Right: Joni Peterman, Secretary; Roger Pittman, President; Sharon Holte, Member-at-Large

Front, Left to Right: Ann Proctor, Treasurer & Co-Editor; Roni Poteat, Membership Chair; Kay Thompson, Vice President

Absent was Editor, Teri Stoiber

The Passing of the Gavel: Past President, Yam, passes the gavel to Roger Pittman, 2011 CSMS President

Mike Nelson gave a very interesting and informative lecture on the physiology of Colorado

CSMS Life Members

Left to Right: Kay Thompson; Eloise Berry; Charles Webb, Jr.; Roy Wilson; Steven Veatch; Raymond Berry; Jack Thompson; Michael Wheat

Among the Rocks by Robert Browning

President Roger Pittman congratulates Roy Wilson for his 50 Years' membership in CSMS (see related article by Ray Berry in this issue.)

Bill & Betty Cain

Oh, good gigantic smile o' the brown old earth, This autumn morning! How he sets his bones To bask i' the sun, and thrusts out knees and feet For the ripple to run over in its mirth; Listening the while, where on the heap of stones The white breast of the sea-lark twitters sweet. That is the doctrine, simple, ancient, true; Such is life's trial, as old earth smiles and knows. If you loved only what were worth your love, Love were clear gain, and wholly well for you: Make the low nature better by your throes! Give earth yourself, go up for gain above!

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	February 2011	- CSMS CALEND	AR			
		1	2	3	4	5
				7 p.m. Board Meeting		
6	7	8 Micro-Mounts Cancelled until Jan. 7 p.m. Fossil Group	9	10	11	12-4 p.m. Lapidary Group- 6811 Mission Rd., Sharon Holte's place.
13	14	15	16	17 7:30 p.m. General Assembly 5:15 & 6:30 Pebble Pups & Juniors	18	19 12 p.m. Jewelry Group
20	21	22	23	24 7 p.m. Crystal Group 7 p.m. Faceting Group	25	26
27	28					

Feb—Crystal May—Jewelry Aug—Picnic

REFRESHMENTS FOR GENERAL ASSEMBLY MEETINGS Mar—Faceting June—Lapidary Sept—Projects

April—Fossil July—Micromounts Oct—Board

Area	Code	719

President	Roger Pittman		
VICE PRESIDENT	Kay Thompson		
Secretary	Joni Peterman		
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Member-at-Large	Sharon Holte	217-5683	SHolte@csu.org
Member-at-Large	Bob Germano	487-8945	(gliders1@hotmail.com
Past President	Ron Yamiolkoski	488.5526	Ron.Yamiolkoski@aecom.com
Field Trip chair	Ron Yamiolkoski	488-5526	Ron.Yamiolkoski@aecom.com
HISTORIAN CHAIR	Brenda Hawley	633-5702	bghsprings@hotmail.com
LIBRARIAN	Frank & Ellie Rosenberg	594-0948	emr80918@yahoo.com
Social Committee Chair	Maria Weisser	229-1587	mariaweisser@yahoo.com
Show Chair	Ron Yamiolkoski	488-5526	Ron.Yamiolkoski@aecom.com
Store Keeper	Ann Proctor	684-9010	annmgmt@msn.com
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Fossil Group	Mike Nelson	email	csrockguy@yahoo.com
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LAPIDARY GROUP	Sharon Holte		sholte@csu.com
Juniors & Pebble Pups	Steven Veatch	748-5010	Steven.Veatch@gmail.com
MICROMOUNT GROUP	Phil McCollum		acc@frii.com
PROJECTS GROUP	Ron Yamiolkoski	488-5526	Ron.Yamiolkoski@aecom.com
WEBMASTER	Allen Tyson	268-0775	allentyson@yahoo.com

Locations

pard Meeting: 1st Thursday 7:00p. Senior Center, David sen: 495-8720

ystal Study Group: 4th ursday of the month @ 7:00p, enior Center; Kerry Burroughs: 84-4576

ceting Group: 4th Thursday 7:00p, Senior Center, Paul erry, 578-5466

ssil Study Group: 1st Tuesy @ 7:00p, Senior Center, ike Nelson, csrockiy@yahoo.com

welry Group: 3rd Saturday 12:00p, 15610 Alta Plaza rcle, Peyton, Bill Arnson, 749-328

niors & Pebble Pups: 3rd ursday @ 5:15p & 6:30p, nior Center, Steven Veatch, 48-5010.

pidary Group: 2nd Saturday 12:00p, 6811 Mission Rd., naron Holte.

icromounts Group: 2nd esday @ 7:00p, 1514 North ancock, Phil McCollum, cc@frii.com, Moyra Lyne, 442-673

roject Group: Meeting time BD, Ron "Yam" Yamiolkoski

Page 16

PICK&PACK

DECEMBER 2, 2010 GENERAL ASSEMBLY MINUTES

BY JENNIFER BEISEL, CSMS SECRETARY

The meeting was called to order at 7:09 pm.

A motion was made to approve the November 2010 meeting minutes (sent via email). The motion was seconded and all were in favor. The motion passed.

Announcements and additional agenda items

Chef Kris is not doing the banquet. Yam advised him that we expected him to secure a business license and since he has not, we will make other arrangements.

Reports and Old/Continuing Business

President's report:

- Status of RMFMS Conv./RF/PPG&MS not much changed. We'll be having our CSMS banquet at the Best Western Academy which will help familiarize CSMS members with the facility. The Best Western Academy Hotel will be the site of the Pikes Peak Gem & Mineral Show, the **RMFMS** Convention Headquarters for all meetings, the location of the **RMFMS** Convention Banquet and the gathering point for all of the Field Trips planned in connection with the event. Note; There will be no meeting of the Show Committee in December or January because there are no regular General Assembly meetings those months. Colorado Federation Update - John Rakowski and Yam
- composed a letter on behalf of the CF to encourage the other clubs in the state to join and participate in the Colorado Federation. The letter was sent out the letter on 11/16. They're still waiting for replies.
- Holiday Gathering Update Bob & Yam working on silent auction. Yam bringing sodas, we're supposed to bring a hearty appetizer.

Vice President's report:

- Mike Nelson will speak at the Annual Banquet (General talk on Colorado Geology or whatever?)
- Dave is working on developing a "Speakers Bureau" which lists contacts and potential topics for future VPs to draw from – talked to Linda Laferty regarding previous speakers list (she's looking for it).

Secretary's report: nothing

Treasurer's report (sent via e-mail):

Membership Secretary's report: voted new members in

Editor's report: Sharon printed labels and sent out 4 months of P&P only 2 came back.

Members-at-Large report: nothing

Past President's report: nothing

Committee reports:

Finance Committee: turn it over to next treasurer Web Master issues - none

> Annual Banquet Status – Yam has arranged to have it at the Best Western. Al is going to pick up the keg.???? Tentative reservations for 40 for \$24/ meal have been made.

Lapidary Group Status – Sharon – Dec meeting cancelled.

New Business

Senior Citizen Facility Arrangements -Mike Nelson called Mindy and she hasn't had time to return his call. We're still waiting.

The meeting was adjourned at 8:07 pm.

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

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Welcome to 2011! There has been a changing of the guard, and with it, new ideas, new goals, and (hopefully) more fun! As always, we are looking for articles, poems, photos, essays, artwork, etc. This is your magazine, and contributions are both necessary and welcome. Your membership dues are now considered tardy if they haven't been received by now-be sure to contact Roni regarding cost and obtaining a new membership card. Since the CSMS is celebrating 75 years, and still going strong, Yam has generously begun to piece together our history-his first article on this journey is in this issue. Also, we have many lifetime/long-time members that are being celebrated this year. Ray Berry has written a wonderful article about one such member, Roy Wilson. Perhaps some of the Pebble Pups will consider interviewing other lifetime members and submitting those articles for publication in the P&P?! We are asking that Board Members & Club Coordinators verify the data regarding positions, dates of meetings, where held, etc., and if there are any changes, please email us. Respectfully, Teri & Ann

CLASSIFIEDS . . .

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. The sellers and buyers are responsible for the condition and ownership of any item shown.

CSMS T-Shirts, Badges, and Pins are available for sale at each meeting. See Store Keeper, Ann Proctor. Have You Picked Up Your Membership <u>Award</u> Pin?

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

Postage Here

PICK&PACK P.O. Box 2 Colorado Springs, CO 80901-0002

Time Value Do Not Delay Feb 2011

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. <u>Visitors are always welcome</u>.

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 13.

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—\$25 Family—\$35 Juniors—\$10 Corporate—\$95

If you are interested in joining CSMS or would like more information, we encourage you to attend our next General Assembly meeting or visit our web site: www.csms.us.