

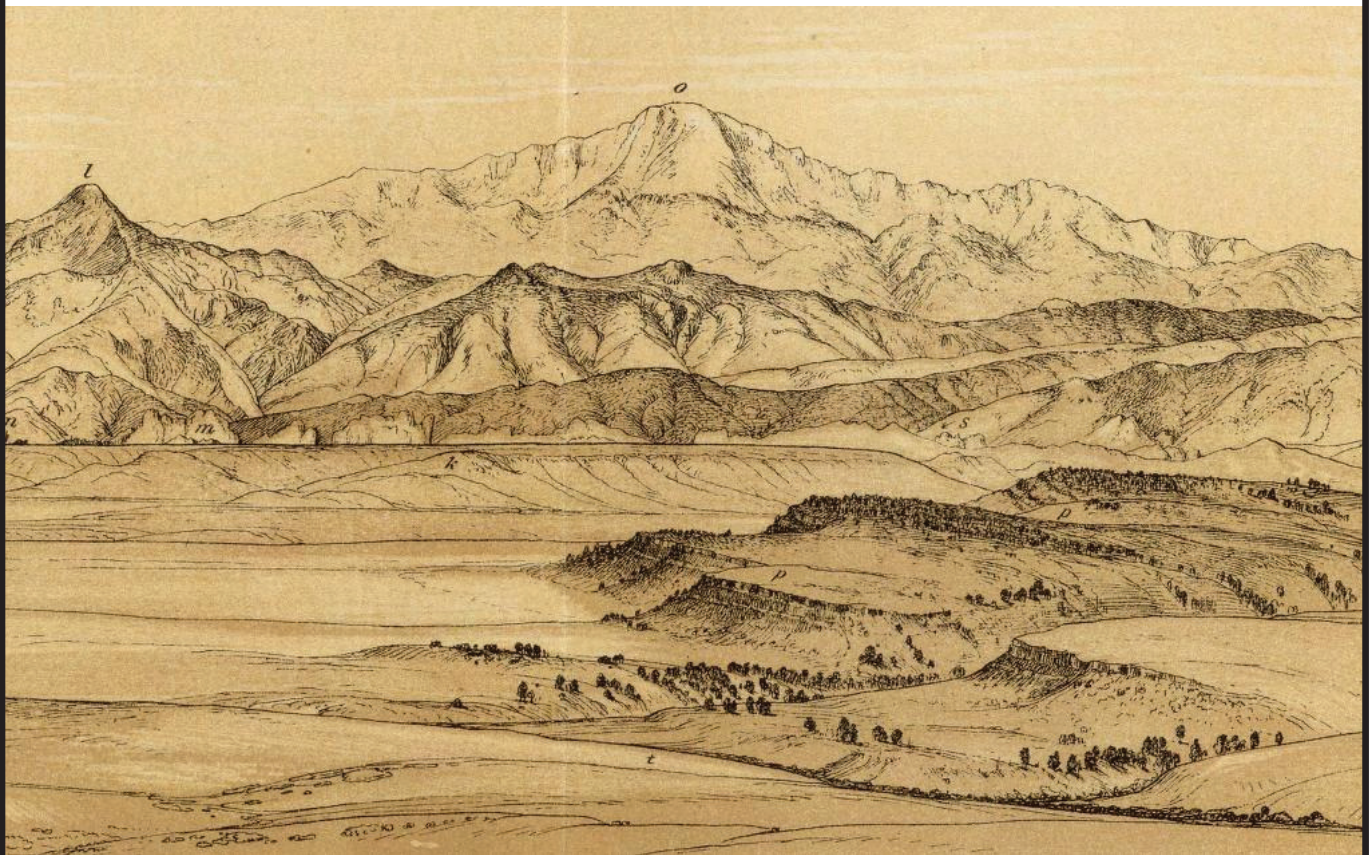
Colorado Scientific Society

*The objective of the Society is to promote
the knowledge and understanding of Earth science,
and its application to human needs*

Colorado and the Four Great Geological Surveys of 1867–1878

By Emmett Evanoff

University of Northern Colorado, Greeley



NEW Location!!



Note Date Change!!

Thursday, March 26, 2009

See map inside!!

**Colorado School of Mines—Department of Geology and Geological Sciences,
Berthoud Hall, Room 241, Golden, CO**

Social half-hour—6:30 p.m. Meeting time—7:00 p.m.

Colorado and the Four Great Geological Surveys of 1867-1878

By Emmett Evanoff, University of Northern Colorado, Campus Box 100, Greeley CO 80503;
emmett.evanoff@unco.edu

After the Civil War, the United States shifted its attention to the development of the West. Not only was the transcontinental railroad built, but mining districts were discovered and eventually agriculture spread throughout the Great Plains and Rocky Mountains. Along with this expansion was a need to learn the distribution and amounts of geologic resources such as mineral ores, coal and eventually oil. The science of geology had also developed through numerous state geological surveys, so that new techniques in mapping and geologic interpretations were available. Four geological surveys were funded by Congress in the late 1860's and 1870's to describe the geology of the West. They included the Geological and Geographical Survey of the Territories led by Ferdinand Vandeveer Hayden, the Geological Survey of the 40th Parallel led by Clarence King, the Geological and Geographic Survey of the Rocky Mountain Region led by John Wesley Powell, and the U.S. Survey & Explorations West of the 100th Meridian led by Lieutenant George M. Wheeler. These Four Great Surveys are known as the Hayden Survey, King Survey, Powell Survey, and Wheeler Survey.

Colorado benefited from all of these geological surveys. All four surveys overlapped somewhere in Colorado, but Colorado was the main focus of the Hayden Survey between 1873 and 1876. The Hayden Survey was divided into 4 groups that made topographic maps and outlined the geologic features of the entire state. The topographic mapping of Colorado by Hayden's surveyors was so good that their work was not superseded until after World War II. When the Colorado Atlas was published by the Hayden Survey in 1877, Colorado became the only state that had a detailed geologic map published on a topographic map base. The King and Powell surveys overlapped with the Hayden Survey in northwest Colorado, but the greatest overlap was with the Wheeler Survey that extended into the southwest and south-central part of Colorado. Conflicts arose between the Hayden and Wheeler surveys, both in the field and in Congress.

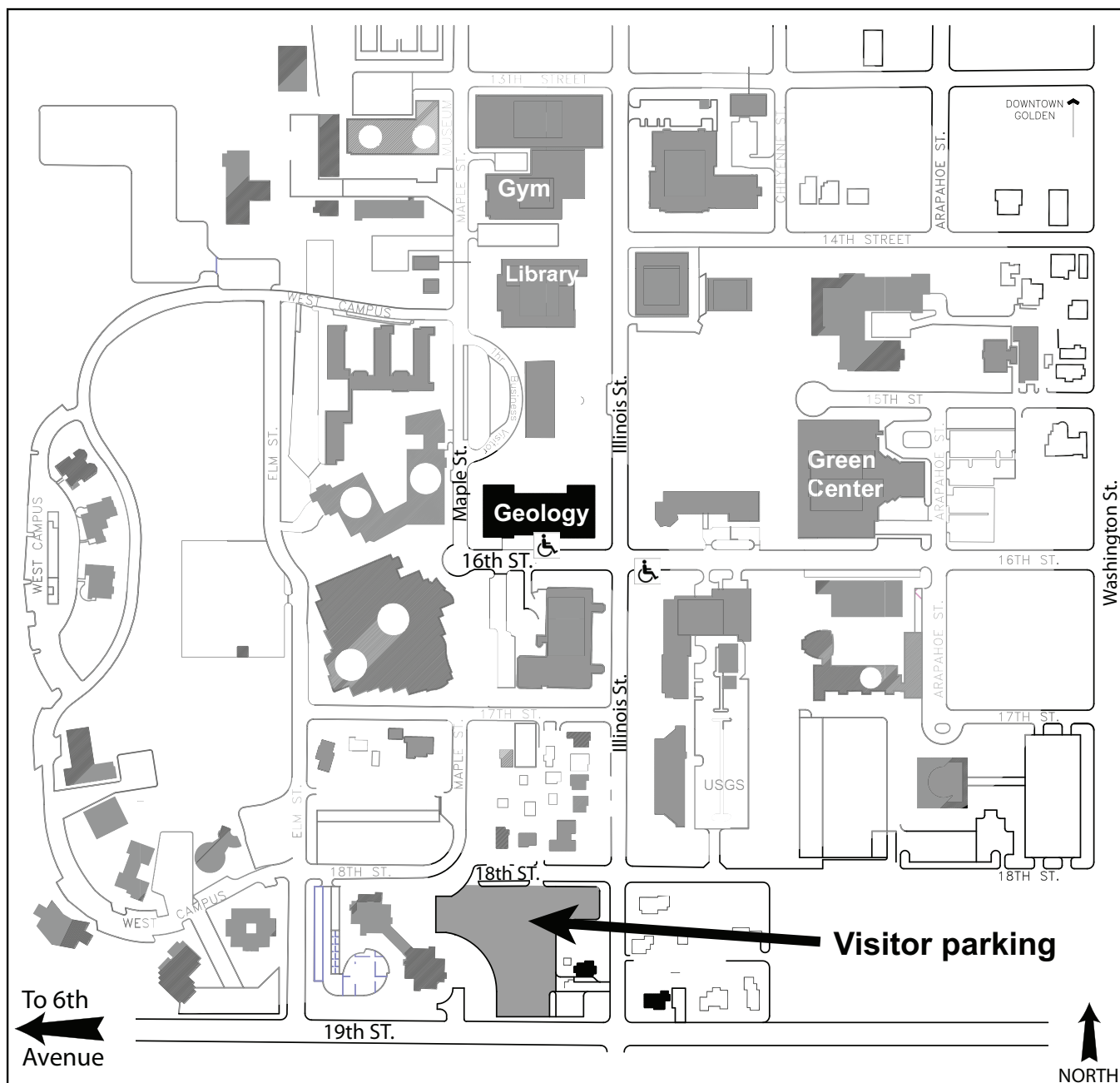
From the conflicts of the overlapping Surveys in the 1870's, and the great expense of supporting 4 geologic surveys, Congress combined all four surveys into the U.S. Geological Survey (USGS) in 1879. The first Director of the USGS was Clarence King, who served for one year and then was replaced by John Wesley Powell. Hayden was shunted to an administrative role in the early USGS, but his Colorado Atlas became the guide for the USGS maps published after 1879. The USGS set up a Rocky Mountain Division that was based in Denver. This division was headed by Samuel Emmons, who was a member of the King Survey and became one of the founding fathers of American economic geology. Emmons described the geology of the Leadville mining district, and many other mining districts throughout Colorado. He was the first president of the Colorado Scientific Society, founded in 1882.

*Illustration by W.H. Holmes with Hayden's surveyors
A.D. Wilson and Frank Rhoda on top of La Plata Peak.*

Emmett adds:

Just a short note to let you know that after my talk, I will be asking the audience for any thoughts or anecdotes about the early geologists in Colorado, and that we want YOU (the audience) to bring to the meeting maps, monographs, and other publications from the early Surveys and early days of the USGS to share and discuss with others.





Reminder!!!! CSS evening lectures: Same time....DIFFERENT place!

Just a reminder that the Colorado Scientific Society evening talks have **MOVED to a new location**. Talks are held at the Colorado School of Mines campus, Berthoud Hall, Department of Geology and Geological Sciences, Room 241. **Berthoud Hall** (labeled “Geology” on the accompanying map) is at the corner of Illinois and 16th streets, near the center of the CSM campus.

PARKING: On-street parking is available around the building **AFTER 5 p.m.** A “visitors parking lot” is at the corner of 19th Street and Illinois Street; from there it is a short two-block walk north to the geology building. Handicapped spaces are around the building, with a few more “kitty-corner” to the SE on 16th. Watch for the blue curbs and (or) blue signage.

GETTING TO THE LECTURE ROOM: Room 241 is located on the second floor of the geology building, at the north end, in what used to be the geology museum. From the entrance on the east side of the building (off Illinois Street), you will find stairways a short distance along the first floor corridor; ascend to the second floor and proceed westward almost all the way down the hall to Room 241. Room 241 will be on the left side, near the end of the hallway.



ANNOUNCEMENT: 2009 Geology and Resources Conference

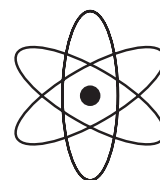
Hosted by: American Institute of Professional Geologists, AIPG Colorado Section, Grand Junction Geological Survey, Mesa State College

Join us in beautiful western Colorado's mountains, canyons, and incredible geology for a diverse program of scenic field trips, technical presentations, and social events. The formal sessions will begin on Monday, October 5 and will end Wednesday, October 7. Sessions will include a full day and two half days with field trips in the afternoon. There will be additional full and half-day field trips throughout the meeting, as well as pre and post 2-day field trips.

Our technical program covers diverse geoscience topics including road construction through mountains and landslides, the impacts of energy development (petroleum, coal, and uranium), resource and reserve classification (it's been 100 years since H.H. Hoover defined proved ore), permitting issues, and geoscience software, its use and misuse. For more info. go to: http://www.aipg.org/2009/GJ_home.htm

U2009 Global Uranium Symposium. May 9–13, Keystone, Colorado

Information and registration materials for the conference, workshops and field trips are available online at www.u2009.org.



Western Interior Paleontologic Society's Founders Symposium 2009 March 14–15

Saturday, 8 a.m. to 5 p.m.

Reception/Art Exhibit to follow
American Mountaineering Center,
Golden, Colorado

Sunday, 8:30 a.m. to 4 p.m.

National Center for Atmospheric Research &
Nat'l Oceanic and Atmospheric Administration
Boulder, Colorado

Learn more and register at:
<http://wipsppc.com/symposium.php>

April 24-26 Colorado Mineral and Fossil Show

Retail and wholesale dealers, minerals,
fossils, gems, jewelry.

10–6 Friday and Saturday,
10–5 Sunday



Holiday Inn-
Denver Central,
4849 Bannock St,
Denver, CO
(frontage road on
west side of I-70)

Free parking and
admission.

Sign-up for the 2008 Colorado Scientific Society Spring field trip: The Victor Mine and Front Range Geology. Saturday May 16, 2009

Join us and be immersed in the innards of the ancient volcano at the Victor Mine outside of Cripple Creek, Colorado. Strange rocks and volcanic structures of many types will be seen—phonolites, lamprophyres, and volcanic cooling columns. Looking at the high wall, tunnels of the old mine workings lend a respect for the immensity of the present operation.

Next the tour will go to the crusher building with its primary cone crusher and secondary crushers that prepare the ore for the leach heaps. The final stop is the Ed Hunter mill building where the solutions come from the leach pads into the charcoal filtering vats. From there the gold is poured... but no one but very trusted employees are allowed in that room!

We will make several stops as we drive down from Lakewood through the Pikes Peak Batholith, the Great Unconformity and the Cambro-Ordovician section, highly fractured and re-cemented sandstone dikes in the Sawatch Formation, and the Tertiary Divide gravel. The mine tour guides (Tim Brown and others) will meet us in Victor at 1:00

p.m. to give us a brief history of the town and mine and then we will head up to the mine for a 2.5-hour tour.

We will leave from the Cold Springs Park-and-Ride at the northwest corner of the Federal Center at 7:30 a.m. We will return to Cold Springs Park-and-Ride about 5:30 p.m. Bring your own sack lunch, beverages, cameras, and rain gear. Cost, including transportation (vans) will be \$20.00/person. Student grants from the Pillmore Fund are available to cover student expenses. Contact Lee Shropshire, 970-352-8778, leeshrop@comcast.net, to apply for a grant. Contact Cal Ruleman (cruleman@usgs.gov; (303) 236-7804) for questions or additional information about the field trip. Send the sign-up form below with remittance (checks written to Colorado Scientific Society) to:

Cal Ruleman, Colorado Scientific Society, P.O. Box 150495, Lakewood, CO 80215-0495.

Deadline is May 9 (but sooner is very much appreciated).



Photograph from www.ccvgoldmining.com.

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Victor Mine and Front Range Geology field trip sign-up form Saturday, May 16, 2009

Name(s) _____

Address: _____

Phone: _____ E-Mail _____

Number of registrants ____ x \$20 = _____ (enclosed)

Write checks to: Colorado Scientific Society

Letter from Van Williams, Mud Flow Adviser, USAID/USGS Emeritus

Hi to everyone back at the office,

Well, the mudflow continues with no hope of stopping. Subsidence destroys the control structures around the vent faster than they can be rebuilt and lowers the outer levees that confine the mud deposits. Subsidence and venting of methane has spread outside of the area where the mud is confined and endangers the main transport link between the port of Surabaya and the hinterland to the east. Other than that, things here are wonderful.

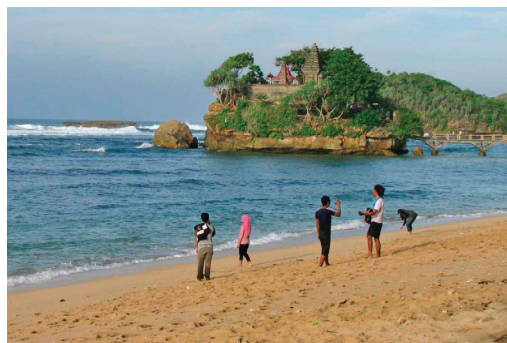
I try to get out for some adventure every weekend, which really leaves little time for physical rest. Instead of heading for the mountains this last weekend, I crossed to the south side of Java to see some of the relatively undeveloped beaches there. I had trouble getting dependable information. Some people said you couldn't get there on public transport or that it would take a long time. Others said there was no place to stay there, so I would have to come back to Malang City for the night. That was all wrong. There was not a lot of accommodation, and it was pretty basic, but it was fine.

Plenty of places to buy food, again pretty basic. This beach is primarily a park for Indonesians. There were only four "westerners" (UK, Australia, South Africa, US) including me the whole weekend. Saturday was a little cloudy, but Sunday was beautifully clear even in the peak of the rainy season. The main beach was pleasant enough although perhaps a little tacky and messy. They had a cute Hindu temple on a small rock island just off the beach. At the far end of the beach, however, was a trail through the jungle just inland from the beach, and human activities dropped off drastically as I went farther along that trail. There were about five distinct beaches along that trail separated by rocky limestone karstic headlands of uplifted reef rock, becoming progressively more beautiful and wild. In the jungle, there were wildflowers and beautiful butterflies. It was amazing to find such a perfect wilderness in a place as densely populated as Java.

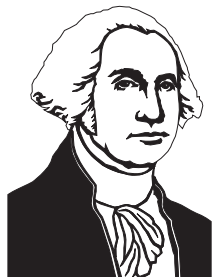
After the fifth beach I came out into a large bay with several more small beaches, one of which had five or six colorful small boats pulled up above high water. I waded across a clear clean flowing creek and found a small fishing village of bamboo and thatch. There were some fishermen there who were a little surprised to see me, but very friendly. They gave me a cup of tea and we sat down in the shade and had a conversation that pushed the limits of my Indonesian. One of the old men (my age) had worked on cruise ships around the world as a cook and could speak some English. He fondly remembered Miami and told me he is Buddhist. There are some Buddhists (including a Tibetan monastery in Surabaya) and many more Hindus in this part of Java, reflecting the closeness to Bali.

The foreigners back at the lodge were English teachers working at a school near my project at the mudflow. The Australian was of Sri Lankan ancestry, and she had gotten into language teaching when she volunteered to teach orphans in Nepal for a few months, so we had some common ground to talk about.

By my standards it was almost a perfect weekend. South Java is noted for huge waves that grow for thousands of miles crossing the Indian Ocean from the storms of Antarctica, so swimming can be a little tricky. We did find "safe" places to swim, but I didn't go far enough offshore to see many big fish. The water temperature is perfect. I wish some of you could have come along, but here are a few pictures to give some of the flavor.--Van



President's Message by Don Sweetkind



The room was perfectly set up as the guests began to arrive...the lights were dazzling...the presenters entertaining.... No, I am not talking about the Academy Awards—I am talking about our new meeting room in the geology building on the School of Mines campus (Room 241, Berthoud Hall). Over fifty people were in attendance for the February CSS talks, the best turn-out in a couple of years. Jeff Bader gave a well-researched and thought-provoking talk on possible wrench-fault origins of the Douglas Creek arch; Tom Casadevall gave a highly entertaining talk on the LUSI "mud volcano" in Indonesia, touching on geology, culture, politics, Boots and Coots, and more! And the new lecture hall was a hit: better acoustics, a space that fits the size of our group, and a few new faces in the crowd as well.

Prior to the meeting, the Society Council met and discussed plans for upcoming programs including Family Day in April (we hope to get into the Edgar Mine, the CSM experimental mine in Idaho Springs); the back-to-back talk/CSM museum visit and Victor-Cripple Creek field trip to the Cresson open-pit mine in May; and began formulating plans for a 2-day symposium in the fall. Stay tuned for more information on all of these upcoming events.



Earth Science Meetings and Talks

Newsletter items must be received by the 25th of each month.



Colorado Scientific Society's regular meetings are held the 3rd Thursday of the month at the Colorado School of Mines Geology Building in Golden (unless otherwise advertised). Social time begins at 6:30 p.m. and talks start at 7:00 p.m. For more information, contact Don Sweetkind, at 303-236-1828, dsweetkind@usgs.gov

Café Scientifique Wynkoop Brewery, evening science talks at 6:30. Free, except for beer. <http://www.cafescolorado.org>

CO-AIPG (American Institute of Professional Geologists, Colorado Section) 11:30 a.m. social gathering; Noon luncheon and subsequent speaker presentation. **Mar. 17**—The Honorable John Hickenlooper, Mayor, City and County of Denver, CO, "Comments on the Current Scene (tentative)." 2009 luncheons to be held at the Petroleum Club (in the Denver Athletic Club building), 1325 Glenarm Street, Denver. Please make an advance reservation so seating and food preparation are adequate to cover attendance. Cost is \$25 with advance reservation and \$30 at the door. Paid parking is available along the street (metered) or in the adjacent parking lots and parking structure. Contact Jim Russell by Noon on Mar. 12 for reservations or via e-mail at csmminer@msn.com

Colorado School of Mines, Van Tuyl Lectures Thursdays from 4–5 p.m. in Berthoud Hall room 241. **Mar. 19**—*Chunmiao Zheng, 2009 Birdsall-Dress Distinguished Lecturer, University of Alabama*, "Understanding solute transport in extremely heterogeneous porous media: Lessons learned from 25 years of research at the MADE site ("MADE"—Macrodispersion experiment)."; **Mar. 26**—*James Burnell, Colorado Geological Survey*, "Resource Constraints on Alternative Energy Development." <http://www.mines.edu/academic/geology>

DIPS (Denver Intl. Petroleum Society) **Mar. 13**—*Maria Henry and Mike Pentilla*, "Trinidad Mud Volcanoes: A Drilling Example and Exploration Implications." Regular meetings held 2nd Friday of the month at Wynkoop Brewing Company, 1634 18th Street, Denver. Gather at 11:30 am; Lunch served at Noon; Presentation at 12:30. Lunch price: \$15 for members, \$18 for non-members, \$3 talk only. Please e-mail Bob Zilinski, at rezilin@aol.com or call him at 303-885-0615 to make reservations before Wednesday, noon, Mar. 11, 2009.

Denver Mining Club, Ltd. **Mar. 16**—11:30 a.m., CSM Geology Museum tour, with Bruce Geller, Director, CSM Geology Museum. Meet at the museum. Bring your own lunch. **Mar. 23**—*Jim Jehn, President, and Gina Burke, Senior Project Manager, Jehn Water Consultants, Inc.*, "Liquid Gold from the Hock Hocking Mine, Park County, Colorado." **Mar. 30**—*Michele White, President, All One River GIS Services*, "Core Logging at Tameapa, a Moly Porphyry in Sinaloa, Mexico: A Cultural Photo Essay." Meetings held at: Country Buffet, 8100 West Crestline Ave, SE corner at Wadsworth, Littleton. Purchase of buffet lunch required. Every Monday, except when noted. 11:30 a.m. - 1:00 p.m. (+/-). VISITORS ALWAYS WELCOME!

Denver Museum of Nature and Science **Mar. 18**—7:00 p.m., Natural Disasters on Other Planets, by David Grinspoon, Ph.D. Gates Planetarium; use Ricketson/evening entrance. **Mar. 19**—7:00 p.m., Climate Change and its Threat to Wildlife, by Terry Root, Ph.D. Ricketson Auditorium; use Ricketson evening entrance. \$12 member, \$15 non-member. Call for reservations at 303.322.7009. <http://www.dmns.org/main/en/General/Education/AdultProgram/Lectures>

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water Building, 12700 West 27th Avenue, Lakewood. Social 6:30–7:00 p.m. Presentation at 7:00 p.m. Meetings are normally scheduled for the first Monday of each month. For information contact Jim Piper, (303) 932-0137, or the website <http://www.dregs.org>

Denver Well Logging Society (DWLS) meets on the third Tuesday of each month, Sept. through May. Lunch and a technical talk at the Wynkoop Brewery begins at 11:20 a.m., 18th and Wynkoop Sts. in Denver. Call Sarah Voight at 720-946-1374 by prior Thursday for reservations. **Mar. 17**—*Matt Bratovich, Baker Hughes*, "Application of Pulsed Neutron Elemental Spectroscopy Measurements in Heavy Oil and Shale Gas Reservoir Evaluation." <http://dwls.spwla.org>

Rocky Mountain Association of Geologists (RMAG) **March 27**—15th Annual 3-D Seismic Symposium, Marriott Hotel, downtown Denver, Colorado. Attendance last year: 700. <http://www.rmag.org/events>

Rocky Mountain SEPM 11:30 Reception, lunch at noon, speaker at 12:30. Reservations: luncheons@rmssepm.org, before noon of preceding Friday. \$20.00 lunch, \$3 talk only. Wynkoop Brewing Company, 1634 18th St., Denver. **Mar. 31**—*Brian Berwick*, "Deposition Environment, Mineralogy and Sequence Stratigraphy of the late Devonian Sanish member (Upper Three Forks), Williston Basin, North Dakota." <http://www.rmssepm.org/luncheons.shtml>

Colorado Scientific Society
P.O. Box 150495
Lakewood, CO 80215-0495

<http://www.coloscisoc.org>



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Best Paper Award:	Don Sweetkind, USGS, 303–236–1828, dsweetkind@usgs.gov
Database Manager:	Erik Oerter, CGS, erik.oerter@state.co.us
Field Trips:	Cal Ruleman, USGS, 303–236–7804, cruleman@usgs.gov ; Karl Kellogg, kkellogg@usgs.gov
Graphics:	Lisa Rukstales, USGS, 303–236–5547, lrukstales@usgs.gov
History:	Beth Simmons, cloverknoll@comcast.net
Membership:	Thom Fisher, Libby Prueher, TC Wait, Eric Nelson, Beth Simmons
Memorial Funds:	Matt Morgan, CGS, 303–866–2066 matt.morgan@state.co.us
Newsletter Editor:	Lisa Rukstales, USGS, 303–236–5547, lrukstales@usgs.gov
Outreach:	Sue Hirschfeld, 720–565–9302, eqdoc@ix.netcom.com
Pillmore Fund:	Lee Shropshire, UNC, 970–352–8778, leeshrop@comcast.net
Program:	Emmett Evanoff, 303-444-2644, emmettevanoff@earthlink.net , Libby Prueher, Christine Turner
Publicity:	Emily Taylor, 303–236–5050, emtaylor@usgs.gov
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