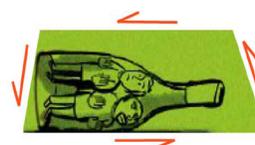


Colorado Scientific Society

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

2010 President's Address and Annual Business Meeting

**What's Up, Down, and *Sideways* about Fault Slip
on the Santa Barbara Coastal Plain and Channel
Islands, Southern California: Tests of Neogene-
Quaternary Rotation Model for the Western Transverse Ranges**



Wednesday, December 8, 2010

Colorado School of Mines—Dept. of Geology and Geological Sciences
Berthoud Hall, Room 241, Golden, Colorado
Social half-hour – 6:30 p.m. Meeting time – 7:00 p.m.

PRESIDENT'S ADDRESS ABSTRACT

What's Up, Down, and Sideways about Fault Slip on the Santa Barbara Coastal Plain and Channel Islands, Southern California: Tests of Neogene-Quaternary Rotation Model for the Western Transverse Ranges

Scott Minor, U.S. Geological Survey, Denver, Colorado

It is generally accepted that crustal blocks underlying the western Transverse Ranges (WTR) of coastal southern California have rotated $\sim 75^{\circ}$ - 90° clockwise since about 16 Ma, based largely on seminal paleomagnetic studies done in the late 1980s by Bruce Luyendyk and his students at UC Santa Barbara. Most believe that these rotations resulted from the unique geometric and geologic configuration and evolution of this part of the dextral transform tectonic plate boundary during the Neogene and Quaternary. Such large block rotations are expressed by the anomalous east-west topographic and structural grain of the province, which encompasses (from south to north) the Channel Islands, Santa Barbara Channel, Santa Barbara coastal plain, and Santa Ynez Mountains. Analog transrotational geometric models and tectonic reconstructions predict that slip on the set of parallel faults bounding and accommodating the rotating blocks should have evolved from normal and oblique normal-sinistral movement to sinistral, oblique sinistral-reverse, and reverse movement as the rotations proceeded. In this talk I present kinematic data (slip surface orientation, slickenline rake, and slip sense) from exposed faults north and south of the Santa Barbara Channel to test these rotational models and to reveal the kinematics of neotectonic deformation. The latter provide clues concerning the causes of spatially variable Quaternary uplift rates, strain partitioning of potentially seismogenic structures, and relationships between fault kinematics and landscape change.

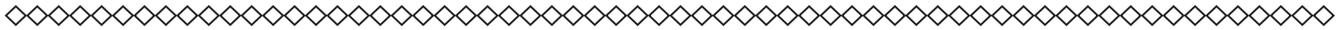
The Santa Barbara coastal plain north of the Channel is structurally dominated by the Santa Barbara fold and fault belt (SBFFB) and the Santa Ynez Mountains uplift overlapping it to the north. The SBFFB is a WNW-trending zone of potentially active folds and partly blind oblique-slip reverse and thrust faults that spans the entire coastal plain and continues into the lower southern flank of the Santa Ynez Mountains. On the coastal plain several folds of this zone deform older alluvial and marine terrace deposits and have subtle to strong geomorphic expression that is consistent with a youthful age of deformation. Kinematic data were collected from numerous small-scale (<5 m displacement) and map-scale (5 to >100 m) fault surfaces exposed in the coastal plain area within sedimentary rocks and deposits ranging in age from middle Eocene to late Pleistocene. WNW- to NW-striking faults cutting Miocene and older rocks on the lower flanks of the Santa Ynez Mountains exhibit multiple generations of slickenlines, many indicating older normal- and oblique normal-slip movement and younger oblique strike-slip and reverse movement. Structural restorations suggest that much of the folding and associated reverse faulting in the SBFFB were preceded by normal- and strike-slip faulting. Some WNW- to NNW-striking faults show evidence of both dextral and sinistral strike-slip movement, and for several of these dextral slip postdates sinistral slip. Some reverse faults in Miocene and older rocks exhibit progressive shifts in slickenline rakes that are consistent with clockwise rotation of the faults. Faults in middle and upper Pleistocene marine and alluvial sediments on the coastal plain lack evidence of early normal slip, but otherwise have slip histories similar to faults in the older rocks and show abundant evidence of late reverse and oblique reverse movement. Structural and stratigraphic age relations observed in the area imply that late Cenozoic uplift and related transpressional deformation was most pronounced during the Plio-Pleistocene, and was preceded by a possibly widespread episode of normal faulting and transtensional deformation during the middle to late Miocene. Kinematic measurements were also obtained for small- to large-displacement (<1 m to >1000 m) faults on Santa Rosa Island (SRI), one of four E-W-aligned islands on the south side of the Santa Barbara Channel. Most of these faults have W-WNW strikes, and many displace Quaternary (mostly ~ 80 - 120 ka) marine terraces and overlying deposits. One such fault, the large SRI Fault spanning the length of the island, sinistrally deflects stream channels and separates differentially uplifted and dissected blocks. The SRI fault kinematic observations suggest that normal-sinistral and sinistral strike-slip movement prevailed on \sim W-striking faults in Pliocene and earlier Quaternary time. Later Quaternary slip on these faults was characterized by greater components of reverse and, locally, dextral slip.

Fault-slip patterns in the Santa Barbara coastal plain area and on the Channel Islands broadly support the clockwise transrotational model for the WTR involving late Miocene transtension and Plio-Quaternary transpression. Not predicted by the model, however, are the observed large components of dextral slip that commonly overprint sinistral-reverse slip on some WNW-striking faults. Such overprinting may reflect increased accommodation of the regional, transform-related NW-trending dextral shear couple by dextral slip along faults as they are rotated into strikes approaching the NW trend. This study



Inspiration Point, Channel Islands National Park, Calif.

indicates that strongly oblique contractional (transpressional) deformation has prevailed in this part of the WTR throughout the Quaternary, and based on earthquake focal mechanisms, such deformation is ongoing. Despite the similarities in fault slip north and south of Santa Barbara Channel, Quaternary uplift rates (based on precise ages of elevated marine terraces) differ significantly between the two areas (i.e., larger on the coastal mainland). Thus, fault slip rates may have a greater influence on uplift rates than slip geometries.



CSS President's Farewell Message by Scott Minor

Well here it is the 1st day of December already, which means that, with some remorse, I have only one week left as your president. I'm sure many (most?) of you can relate to my view that 2010 has just flown by and that the year's activities seem like a whirlwind. However, the whirlwind did not prevent the Society from hosting several notable scientific talks, field trips, and events and achieving a few milestones during the year. With the many and varied accomplishments of the Society in 2010, a brief review of the year is in order.

In January a near-capacity crowd showed up to listen to Emmons lecturer *Jim Kennett* talk about the Younger Dryas impact hypothesis. At the February meeting the theme was landslides, so we heard excellent talks on the Rincon Mtn., Calif. (think La Conchita) "megaslide" (*Larry Gurrola*) and on Colorado debris flows (*Jeff Coe*). (Jeff was recently voted to receive the 2010 CSS Best Paper Award—see announcement on p. 4.) For our March meeting (actually held in early April), we broke from convention and successfully co-convoked a meeting with the *Western Interior Paleontological Society* (WIPS) at the Denver Museum of Nature and Science. At the meeting, *Emmett Evanoff* gave an engaging talk on his harrowing "bad day in the field" experience in the Dakota badlands, followed by a moving memorial tribute to his recently deceased field assistant and rescuer *Terry Heister*. At the regular April meeting, we were treated to the *Warren Hamilton Show*, an admirable two-prong "assault" (two talks) on conventional wisdom regarding plate tectonics and the Earth's first 4 billion years. The May meeting featured talks by *Jonathan Caine* and *Zach Wessel* addressing structural aspects of Proterozoic rocks in the Colo. Front Range, which was followed by a most intriguing and well attended spring field trip on the same topics. This year the traditional *Family Day* event was held in June at the Morrison Natural History Museum. Although the group was small, those that attended enjoyed a potluck barbeque followed by guided tours of the museum. In an exciting late summer development, we learned that *CSS was approved to be an Associated Society of GSA*, which begins a promising new partnership not only with GSA but also with 56 other associated societies. The September meeting (science talks by *Ed Dewitt*, *Lucy Piety*, and *Pete Birkeland*, and a tribute by *Jack Reed*) and fall field trip to the *Aspen region* was dedicated to past-president *Bruce Bryant* and his exceptional geologic research near Aspen and beyond. Late Oct.-early Nov. was a most exciting time for the Society. First, at the annual CSS Student Night, 6 students were awarded cash prizes commensurate with the quality of the scientific talks they each presented. The following week, CSS had a huge presence at the *national GSA meeting and convention in Denver*. Besides co-sponsoring two field trips, the Society convened a topical session focused on the historical role CSS founders and members played in geologic and paleontologic research in Colorado, and for the first time CSS had a booth in the Exhibits Hall. The final regular meeting of the year in Nov. featured excellent talks by *Anne Sheehan* on Rio Grande rift GPS results and by *Marith Reheis* on pluvial Lake Manix in the Calif. Mojave Desert.

So, I think it is accurate to say that CSS had a most active and successful year! However, there are a few items on my "CSS To-Do" list I put together when I took office that have not yet been completely crossed off the list. Still at the top of my list is the CSS website revamp. I am happy to report that the website committee is making good progress on the website redesign, and we hope to roll out the new site sometime in the late winter or spring. The other item is the ongoing challenge of increasing our student/young-professional membership numbers. Fortunately we are making some progress on this front too, thanks to some successful student recruiting at the CSS GSA booth and the efforts of our newly established Membership/Mentor committee led by *Mitch Reese* and *Liz Pesce*. Speaking of mentoring, the Society will soon be making a formal call for volunteers for future mentorship and outreach/education programs.

As I pass the torch on to our next president, I want to wholeheartedly thank all of the CSS officers, councilors, and committee members who worked with me this year to help keep the Society running. All of you did a superb job. It has been a fun ride for me as president, even if it was a whirlwind. I wish our incoming president, *Lisa Fisher*, all the best during her term!



CONGRATULATIONS JEFF COE !

2010 RECIPIENT: CSS BEST PAPER AWARD



“DEBRIS FLOWS IN COLORADO”

PRESENTED 17TH FEBRUARY, 2010

Oak St. in Telluride, July 27, 1914

Photo courtesy of Denver Public Library

Sat., Dec. 4, 9 a.m. to 4 p.m., Colorado School of Mines Geology Museum “Garage Sale”:

“Because of the growing piles of recent donations to our Museum, I would like to invite you to our winter garage sale in the conference room across the hall from our Museum entrance. There is no cost to attend this sale, and you are allowed to purchase any items that you desire, at their marked prices. Pay for your goods in our Gift Shop using cash, check, or credit card. We anticipate quite a crowd. Prices on most items will drop a certain percentage every hour, starting at 10 A.M. Thank you for all of your support!”—Bruce Geller, Director

The museum is at 1310 Maple St. (corner of 13th and Maple Streets) on the CSM campus, Golden, and is well worth a visit at any time; daily hours are 9–4 Mon. through Sat., 1–4 Sundays. “The beautiful new museum at the Colorado School of Mines is one of the treasures of our state’s legacy. Filled with fabulous mineral, ore, and fossil specimens, the collection has been amassed since the earliest days of the Territorial School of Mines in the 1870s.” **Did you know?** Evaluation of specimens is performed between 10 a.m. and noon, Tuesdays through Thursdays. If you have a mystery rock/mineral specimen that has always puzzled you, consider bringing it to the museum at the appropriate times.



FREE at the USGS Map Store...

As in past years, bundles of “government surplus” maps are being given away for use as gift wrapping (alternatively, “Suitable for Framing,” if you happen to get a map that you really like!). Available now through Christmas, in-person only at the USGS Map Sales room, Denver Fed. Ctr., Bldg. 810, Lakewood. (enter through the Main Gate, Gate #1, off Kipling St. between 6th Ave. and Alameda). The store is open from 8 a.m. to 4 p.m. weekdays only. Call 303-202-4675 for more information or directions.



Save the date for the....

49th Annual S.F. Emmons Lecture

Crete before the Cretans: Palaeolithic Mariners in the Mediterranean

by

Dr. Thomas F. Strasser
Associate Professor
Department of Art and Art History
Providence College
Rhode Island

Thursday, January 13, 2011
8 P.M.
Metals Hall, Green Center,
Colorado School of Mines
Golden, Colorado



Photo credit: Nicholas Thompson

Dateline 2/22/2010, Providence College, RI—

The discovery of early tools on the Greek island of Crete by an archeological team led by Providence College faculty member Dr. Thomas F. Strasser points to seafaring in the Mediterranean by our human ancestors much earlier than previously recorded. These stone tools, including hand axes made of quartz, date back at least 130,000 years, according to the team's findings.

Strasser, an associate professor of art history at PC whose specialty is Greek archaeology, explained that these findings may push the history of seafaring in the Mediterranean back by more than 100,000 years and have implications on the colonization of Europe and beyond by early African hominins—our pre-Homo sapiens ancestors.



Photo credit: Nicholas Thompson and Chad DiGregorio



The area around the town of Plakias may have been inhabited as early as 700,000 years ago, possibly by Homo erectus who left behind stone tools at several sites. (Photo: Wikipedia Commons)

Cool Websites! *(Thanks to Bruce Wahle for sending these to me!—ed.)*

Fire in the Nubian sky—Meteorite fall in Sudan October 7, 2008

<http://saudiaramcoworld.com/issue/201006/fire.in.the.nubian.sky.htm>

Saudi Aramco World, Nov./Dec. 2010

GIS in Geology—125 Years of Topographic Mapping

In part one of a two-part series, read how mapping evolved at the United States Geological Survey from 1884 to 1980.

<http://www.esri.com/news/arcnews/fall09/articles/125-years.html>

125 Years of Topographic Mapping—USGS History, Part 2: From the Dawn of Digital to The National Map

<http://www.esri.com/news/arcnews/winter0910/articles/125-years.html>

iGeology App for your iPhone!

iGeology is a new free iPhone App that lets you take a geological map of Britain with you wherever you go to help you learn about the rocks beneath your feet. And with the phone's GPS, you'll know exactly where you are.

<http://www.bgs.ac.uk/iGeology/home.html>

The British Geological Survey (BGS) recently launched OpenGeoscience, a free service where you can view maps, download photographs and other information. (<http://www.bgs.ac.uk/opengeoscience/>).

The Web site uses ArcGIS Online (<http://www.arcgisonline.com/home/>) and the ArcGIS API for JavaScript (<http://resources.esri.com/arcgisserver/apis/javascript/arcgis/>) to serve its wealth of spatial data. **Join ESRI's Dr. Joseph Kerski** as he explores the geology of the United Kingdom using GIS and data from OpenGeoscience:

Investigate the United Kingdom's Geology with GIS

<http://www.esri.com/news/arcwatch/0210/investigating-the-uk.html>



GeoCorps™ America 2011

This summer, GSA and its partner agencies — the U.S. National Park Service, the U.S. Forest Service, and the Bureau of Land Management — will offer more than eighty paid geoscience internships on America's most amazing public lands. All levels of geologists — students, educators, professionals, and retirees — are encouraged to apply. Jobs will be posted online by Dec. 1, 2010; the application period runs Dec. 1, 2010–Feb. 1, 2011. As in previous years, past GeoCorps participants are eligible to apply as Guest Scientists. Learn more:

http://rock.geosociety.org/g_corps/index.htm



STUDENT SCHOLARSHIP, GRANTS, and VOLUNTEER OPPORTUNITIES!!

Subaru, in partnership with GSA, has generously funded a new scholarship program to benefit undergraduate minorities considering a degree in the geosciences. The Subaru Minority Student Scholarship Program provides \$1,500 to one student at an accredited university or college in each of the six North-American GSA Regional Sections and in a World Bank designated low-income country from the International Section as nominated by a GSA Campus Representative. The student also receives a free registration to the GSA Annual Meeting that year and complimentary membership to GSA for one year. The purpose of the award is to encourage minority students to continue studies in the geosciences as a possible degree choice.

<http://www.geosociety.org/aboutus/sponsor.htm>

<http://www.geosociety.org/grants/>

50 Student Volunteers Needed—Help the USGS deploy seismometers to study fault geometries and crustal structure in southeastern California — all expenses paid!

What: Salton Seismic Imaging Project (SSIP)

When: 5–20 Feb. 2011

Where: Imperial and Coachella Valleys, California, USA

Volunteer form: <http://www.gps.caltech.edu/~jstock/VF-SSIP.doc>

Project web site: <http://earthquake.usgs.gov/regional/nca/research/salton/>

Flyer: <http://www.geophys.geos.vt.edu/hole/salton/SSIP-volunteer-ad.v3.pdf>

It's Time to Pay Dues for 2011

a plea from Don Sweetkind, CSS Treasurer



Membership dues for the coming year (2011) are now due. You will find a dues payment form in this issue of the newsletter; you will also see a reminder in the mail or email this month. Dues payments are \$20 for regular members; \$10 for corresponding members (outside the Colorado Front Range area), and \$5 for students. You may pay your dues by mailing a check to the CSS, or you can pay with a credit card using the PayPal link on the “Membership” page of the CSS website, www.coloscisoc.org.

If you are uncertain of your member status or whether you owe dues, contact CSS Treasurer Don Sweetkind by phone at 303-236-1828 or by e-mail at dsweetkind@usgs.gov.

As you renew your membership, we need—in addition to your payment—your current address, phone, and e-mail information so that we can keep our member database current. You can provide this information to us by downloading and printing a mail-in form from the “Membership” page of the CSS website. You may prefer submitting your information via the web. To do so, go to the “Membership” page and select “Online Membership Application Form” in the upper left part of the page. Members paying via PayPal will be taken first to this electronic form.

As you pay your dues, please consider making an additional contribution to one of our Memorial Funds, which support our student research grants program, or the Endowment Fund, which we use to defray operating costs. Also, we are seeking member donations for the purpose of revising and updating the look and function of our web site. Consider making a donation to help us improve how we get information to you! Any contributions made in calendar year 2010 (i.e., checks dated before January 1, 2011, can be credited toward the 2010 tax year.

Please remember that your entire contribution goes towards generating interest for the grants and that your contribution is 100% tax deductible because the Society is a non-profit Section 501 (c)(3) organization. Through interest income generated by our Memorial Funds, we have awarded over \$150,000 in research grant funding to over 200 students.

Ore Microscopy GEGN 404 at CSM—Spring Semester, 2011

3-Credit Semester Course, Tuesday evenings, 6:00 to 9 p.m. at Colorado School of Mines

John L. Lufkin, Ph.D., Course Instructor

Course schedule includes:

1. Optical methods of identifying 50 of the common ore minerals
2. Interpretation of ore textures
3. Study of ore suites from numerous deposits, including Stillwater, MT PGM and chromite deposits; Duluth Complex, MN Cu-Ni-PGM; Eagle, MI Cu-Ni; Sudbury, ONT Cu-Ni; Kidd Creek ONT Pb-Zn; Eskay Creek, BC gold; Cripple Creek, CO alkalic gold; Homestake, SD gold; Bingham Canyon, UT Cu-Mo; Butte, MT Cu; Climax, CO moly; Coeur d'Alene, ID Pb-Zn-Ag; Olympic Dam, Australia IOCG; Salobo, Brazil IOCG; Lisheen, Ireland Pb-Zn; SE Missouri Pb-Zn; Red Dog, AK Pb-Zn; Iron Springs, UT magnetite; Tilden, MI BIF, and others.



Class size is limited to 10 registrants; Mines students will receive preference; other participants must enroll through the Registrar's Office at Mines, 303-273-3200.

All registrants will receive free two comb-bound books, 8 ½ x 11, entitled, Ore Microscopy and Geology of Ore Deposits. For further information, contact Dr. Lufkin, lufk3@comcast.net or 303-975-6364



Colorado Scientific Society

Application and Membership Update Dues and Funds Contributions

(email address)	(Telephone)
(Last Name)	(First Name)
(Initial)	
(Address)	

The success of most Society activities depends on volunteer help. Please circle any activities for which you can provide assistance. We will pass your name on to the appropriate Committee Chairperson.		
Field Trips	History	Outreach
Fund Raising	Newsletter	Program/Talks

Annual Dues (January – December)

Regular Members \$20 _____

Corresponding Members \$10 _____

Student Members \$5 _____

Memorial Funds: These funds support research grants to graduate students in the Earth Sciences throughout the nation. *Please note if contribution is made in the memory of an individual.*

Ogden Tweto Memorial Fund _____

Steven Oriel Memorial Fund _____

Edwin Eckel Memorial Fund _____

Bill Pierce-Heart Mountain Fund _____

George Snyder Memorial Fund _____

Chuck Pillmore Memorial Fund _____

Endowment Fund:

This fund is used to support the Society's monthly meetings and newsletter, field trips, family night, annual Emmons Lecture, and special activities. _____

TOTAL CONTRIBUTIONS (DUES AND FUNDS): _____

Please make your checks payable to the	Or pay on-line using PayPal at:
Colorado Scientific Society	http://www.coloscisoc.org/membership/duespaypal.htm
Send this form & your check to: Colorado Scientific Society P.O. Box 150495 Lakewood, CO 80215-0495	If paying on-line, please also send this application by mail to Colorado Scientific Society.



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 Wednesday 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 Scott Minor, at 303-236-0303, sminor@usgs.gov

Café Scientifique Wynkoop Brewery, evening science talks at 6:30 in the Mercantile Room. Free, except for beer. **Dec. 14** "Could all that sugar you love be killing you?" by *Richard J. Johnson, MD, Chief, Division of Renal Diseases and Hypertension, University of Colorado Medical School.*

Café Scientifique2 Brooklyn's at the Pepsi Center, 901 Auraria Parkway, directly across the parkway from the Auraria Campus. **Dec. 6** "Rehabilitating the Neanderthals!" by *Dr. Julien Riel-Salvatore, Anthropology, UCD.* For upcoming schedule go to: <http://www.cafescolorado.org/Upcoming.htm>

Colorado Ground Water Association's 2010 Holiday Party Wed., Dec. 15 Come join us to celebrate the holidays at Braun's Bar & Grill, 1055 Auraria Parkway, Unit #100, Denver 80214. Happy Hour begins at 5:30 PM (cash bar) with dinner at 6:00 PM. **We are very excited to have a special guest speaker for the evening!** *Mr. Jeff Hart of Layne Christensen Company* will share his experiences from the San Jose Mine rescue in Chile. Reservations: by Noon Wed., Dec. 8. Please RSVP immediately; seating is limited. Cost: Dinner is \$40 per person. Reply by E-mail: RSVP@coloradogroundwater.org

Colorado School of Mines, Van Tuyl Lectures Dec. 9 *Dr. Robert J. Weimer, Professor Emeritus, Colo. School of Mines,* "Hearings before State Engineer confirms that water produced with Oil and Gas in Colorado is classed as non-tributary to streams: Example—Geology of the D-J Basin." Thursdays from 4–5 p.m. in Berthoud Hall room 241. Refreshments served prior to each lecture. <http://www.mines.edu/academic/geology>

Colorado State University, Dept of Geosciences Dec. 6 *Dr. Kevin Mahan, CU Boulder,* "High seismic velocity (7.x) lower crustal layers in cratonic North America: a view from xenoliths and Earthscope seismic data." Rm 320 Warner College of Natural Resources Bldg., Mondays, 4:00 p.m. 970-491-5661. <http://warnercnr.colostate.edu/geo-training/>

Denver Mining Club, Ltd. Dec. 6 *Ed Raines, Collections Manager, CSM Geology Museum,* "Creede, Colorado!" **Dec. 13.** Auction of Mining Memorabilia. Check your attic, closet, & garage for items to donate, or come and look for that special gift. Books, rocks & minerals, jewelry, prospecting & mining supplies & equipment, and much more: Come help us celebrate our 119th anniversary! **Dec. 20** "Holiday Story Time: share an interesting anecdote from your career with the audience, in 5 minutes or so." Country Buffet, 8100 W. Crestline Ave., SE corner at Wadsworth, Littleton, (Purchase of buffet lunch required) Every Monday, except when noted, 11:30a–1:00p (+/-) VISITORS ALWAYS WELCOME! <http://www.denverminingclub.org>

Desk and Derrick Club of Denver Dec. 14 "2010 Holiday Party" 6:30pm–9:30pm at the Curtis Hotel, 1405 Curtis St., Denver. <http://www.deskandderrick.org/>

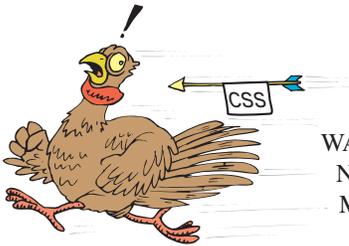
DIPS (Denver Intl. Petroleum Society) Dec. 10 *James Lowell,* "Structural geometries of deep water thrust-fold belts." Regular meetings held 2nd Friday of the month at Wynkoop Brewing Company, 1634 18th Street, Denver. Gather at 11:30 am; Lunch served at Noon; Presentation at 12:20. Lunch price: \$15 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.

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water Building, 12700 West 27th Avenue, Lakewood. **Dec. 6** *David L. Leach, Scientist Emeritus, USGS,* "Sediment-hosted Zn-Pb deposits: a two billion year history of tectonics, evaporites, and the opening and closing of the ocean basins." 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>

Rocky Mountain Association of Geologists (RMAG) Dec. 3 *Rick Fritz,* "Arbuckle play of Kansas." Luncheons are in Denver at the Marriott City Center at California and 17th St. Lunch is at Noon and the Program begins around 12:20 pm. All lunch attendees must pay prior to the lunch with a credit card, Paypal, Check, or Cash. If you do not make the \$30 payment by Thursday prior to the lunch, your lunch will be canceled or sold. Reservations are not accepted after 10:30 a.m. on Wednesday, prior to the luncheon. No reservation is required for the talk only and the cost is \$5.00. <http://www.rmag.org/events/index.asp>

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

<http://www.coloscisoc.org>



WANTED:
New CSS
Members

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Science Fair:	Chuck Weisenberg, 303-238-8806, cweisenbrg@msn.com
Webmaster:	Table Mountain Web Design, 303-278-2701, bwarden@tablemntn.com



** STOP! Do NOT recycle this until after the talk! Please help us with publicity by posting at least the front page of this Newsletter on a bulletin board. Thank you!