

Colorado Scientific Society

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

Terroir - The Connection Between Wine and Geology

presented by

Larry Meinert

Department of Geology, Washington State University



Thursday, March 21, 2002

240 Union Restaurant

240 Union St., Lakewood

Meeting time 5:30

Reservations required. Contact Eric Nelson, 303 237-3811 or enelson@mines.edu

For map and restaurant information see: <http://www.240union.com/home.htm>

Abstract



Terroir - the connection between wine and geology

Larry Meinert

Department of Geology, Washington State University, Pullman, WA, Meinert@wsu.edu

Terroir is a relatively simple term to describe the complex interplay of climate, soil, geology, and other physical factors that influence the character and quality of wine. Although the term has long been used in France, it is increasingly being used in other parts of the world to try to better understand the cause and effect of great wine. This talk will focus on the terroir of Washington State, which is second only to California in terms of wine produced in the United States. This is somewhat surprising in that Washington has a relatively short history of wine production by international standards. Although the first *Vitis vinifera* grapes were planted in 1825 by the Hudson's Bay Company along the banks of the Columbia River in southwest Washington, commercial production extends back only about 100 years and most of the state's 155+ wineries were started in the past 15 years (there were only 19 wineries when the author moved to Washington in 1981).

Washington is a region of superlatives, both oenological and geological, with exposures of some of the world's largest and most spectacular flood basalts, dune and loess fields, and glacial outburst flood deposits. All of these play a part in the *terroirs* of Washington State wines. In addition, recent volcanic activity such as the well-known 1980 eruption of Mt. St. Helens continues to shape the oenological and geological landscape. Most Washington State vineyards are located between latitudes 45° and 48° N, well to the north of the more widely known California vineyards but parallel to some of the great French wine regions such as Burgundy and Bordeaux. This northerly latitude provides about two hours more summer sunlight than occurs in California wine regions. In addition, most Washington vineyards lie in the rain shadow of the Cascade volcanic arc, and many vineyard soils have a component of ash from Mt. St. Helens and other Cascade volcanic eruptions such as the much larger Mt. Mazama eruption (6,850 yr BP) which formed present day Crater Lake in Oregon.

Although there is considerable local variability, most Washington vineyards are located on Quaternary sediments and soils that overlie Miocene basaltic rocks of the Columbia River flood basalt province. Many of the Quaternary sediments are related to cataclysmic glacial outburst floods that formed the spectacular geomorphic features of the Channeled Scablands. This in itself is one of the great geologic stories of all time, and the fact that it is intimately related to superlative wine makes a discussion of Washington wine and terroir particularly worthwhile. The fact that some of the geological and soil features are unique to this part of the world suggests the possibility that Washington wines (including Cabernet Sauvignon, Chardonnay, Merlot, Riesling, and Syrah) may develop flavour and quality characteristics that set them apart from other wine-producing areas.

RESERVATION FORM

I will attend the wine tasting and "Terroir" talk at 240 Union Restaurant on March 21, 2002.
Estimated cost \$30 per person paid at the restaurant.

Name: _____

Phone Number: _____

Email address: _____

Please send to:
Eric P. Nelson, CSS President
GE Department
Colorado School of Mines
Golden, CO 80401

A Note from the President

Eric P. Nelson, President, Colorado Scientific Society

Emmons Lecture Rocks!

For those who missed the Emmons lecture this year, you missed a great talk. Plate tectonics legend John F. Dewey gave a very stimulating talk on transtension, drawing on examples from Newfoundland, Norway, and Death Valley. He showed that field geology is still alive and well, and that the theory of plate tectonics continues to expand and helps explain the variations of strain we see in rocks. Thanks go out to past president Rube Ross who had the vision to start the Emmons Lecture series in 1962. The list of internationally recognized stars in geoscience who have spoken at this annual event is most impressive.

CSS Makes Donations - CSS has donated \$250 to the Rocky Mountain Nature Association for their Day-Long Field Seminar series, specifically for the Bedrock Geology of Western Rocky Mountain National Park. This seminar will be run by Dr. Mark Longman and Keith Graham on 3 August 2002. The RMNA is a non-profit Colorado corporation, whose purpose is to assist the National Park Service, U.S. Forest Service, Colorado State Parks, Bureau of Land Management and other agencies with educational and research programs. To accomplish these purposes, the Association publishes, sells, and distributes interpretive materials to the general public. It also conducts educational seminars each summer and offers membership in the Association to the general public. Any profit gained is put towards the enhancement of educational and research programs. For more information visit www.rmna.org.

CSS has also donated \$200 to Colorado State University to help support a localized rainfall and hail study along the Front Range corridor. Volunteers are needed for this interesting and fun study. See the article on the program in this newsletter.

Geology Affects Wine (or is it the other way around?!) - Remember that this month we have a special wine tasting event accompanying our meeting. The talk will be on "*Terroir - the connection between wine and geology*," by Larry Meinert of Washington State University. As I mentioned in my note last month, this is a very excellent talk, and the wine tasting should be fun as well. Remember the meeting will be held at 240 Union Restaurant in Lakewood, will begin at 5:30pm, and the wine (5-6 varieties) will be served with light food and bread both before and after the presentation; the hors d'oeuvres will easily substitute for dinner. The restaurant meeting room will hold about 40, so reservations are required — please email or call me if you wish to attend. There are still some spaces open! Estimated cost will be about \$30/person, and will be paid at the restaurant.

Family Night Goes Hollywood! - Also remember that we have moved Family Night to 18 April this year. The theme will be "Geology goes Hollywood and other public perceptions of geoscience". We will be showing the short film "*Geology Goes Hollywood*," and author Sarah Andrews will talk about the literary side of things. This should also be a fun event, so get your kids, friends, and relatives ready. Bring the whole lot, after all, that's what Family Night is all about.

Geologic Sign Proposal Submitted - On 25 February, CSS submitted a \$7500 proposal to the Science and Cultural Facilities District to develop and install three geological signs in the Front Range area. The proposed sites are the Buffalo Bill Grave and Museum overlook, White Ranch Park, and Green Mountain. The outreach committee has already developed a prototype of the Buffalo Bill sign. Many thanks go to Paul Belanger, Bruce Bryant, Bob Weimer, Kyle Murray, Greg Holden, Sue Hirschfeld, and Pete Modreski for their hard work getting this proposal together.



Membership Drive

As you know, we are in the midst of a membership drive this year. As our new treasurer, Don Sweetkind, pointed out that, given all the recent donations and costs for out-of-town speakers, I seem to be running the society with a sort of open-checkbook policy. This is another good reason for inviting your friends and neighbors to join the society!

Interview Column

Dr. Stephen Turner, Newmont's Chief Geologist/New Initiatives

By James Shannon

Stephen Turner has been a resident of the Denver area intermittently as he received his Ph.D. from Colorado School of Mines in 1997, subsequently moved to Peru, and has recently been transferred back to Denver. Steve originally hails from Perth in Australia, and has worked extensively in southeast Asia, Peru, and many other countries in mineral exploration. He is currently Chief Geologist/New Initiatives for Newmont Mining Corporation based in Denver.

Following is a summary of Steve's response to a series of questions addressing Newmont's past and current activities in Colorado and the future importance and role of geosciences in Colorado. Currently, Newmont has its Corporate Headquarters in downtown Denver and Technical Headquarters in Englewood. Newmont has had a long history in Colorado focused mainly around mining activities at the Idarado mine in the San Juan Mountains (during 1970's). Reclamation has been completed and the project is now in the monitoring stage. The reclamation project has been viewed very positively by the local community.

Newmont does not have any active mining or exploration programs in Colorado. The main reason is the relatively low technical potential for large, bulk mineable gold deposits (Newmont specializes in Carlin-type and high-sulfidation epithermal gold systems). Probable difficulties in permitting new mines and especially land use conflicts of interest are also important deterrents to exploration. In the future, there probably will be continued low-level exploration activities by other companies in Colorado (after all, who wouldn't like to find another Cripple Creek?!). There has been a shift in the nature of geoscience activities from extractive industries to remediation industries, so there will be a continued demand for geoscientists in Colorado.

Worldwide, grassroots exploration has been cut back and there has been a shift to buying reserves and resources. Steve predicts that the consolidation of the mining industry is probably not over yet, and that with time there will be improvements in production controls and metal prices. With these changes, there will be renewed interest in grassroots and early stage exploration, perhaps by a new wave of junior and intermediate start-up companies, as well as the surviving majors. With Newmont's recently successful bid for Normandy Mining Ltd. they will become the world's largest gold producer and will have to find over eight million ounces of gold per year (assuming no decreases in production) just to replace mined reserves. There is hope.

According to Steve, the best part about living in Colorado/Denver is the proximity to the mountains for hiking in summer and skiing in winter. It is also a great location for the presence of numerous mining/exploration companies and personnel. Steve claims his favorite geologic feature in Colorado to be the Black Canyon of the Gunnison, which is spectacular both for its exposure of gneissic rocks and pegmatitic dikes, and for its unexpectedness amongst the rolling hills in that area. The hogbacks and Red Rocks Park closer to home are also endlessly fascinating as sedimentary stratigraphy set on end up against the Rocky Mountain basement rocks. He likes the Table Mountain alkali basalt flows as well!!



CSS Mourns Former President

Dave Varnes, former President of the Colorado Scientific Society (1972) and an internationally renowned USGS scientist, passed away on Sunday, February 3, 2002. Dave's long and distinguished USGS career began in 1941. Early in his career Dave studied mineral deposits in the Silverton District of Colorado where he became interested in the mechanics of rock failure in underground tunnels, leading to a remarkable analysis of plastic deformation of the rocks. He conducted the engineering geologic assessment of the future site of the Air Force Academy in Colorado Springs. His long interest in landslides and engineering geology resulted in his seminal works on landslide classification, the mechanics of giant landslides, large-scale gravity-spreading, creep-to-failure phenomena, fractal theory, and the logic of geologic maps. Virtually every project he undertook in a sixty-year career became a classic.

Dave was twice the recipient of Geological Society of America's Burwell Award, recipient of the Department of Interior's Award of Merit, Meritorious Service Award, and Distinguished Service Award, the International Association of Engineering Geology Hans Cloos Award (the highest of IAEG), several other international awards, and was knighted by the French Government for his work for UNESCO. He was a fellow of both GSA and the Geological Society of London. Dave served as chair or member of international working groups, professional committees, and national advisory boards throughout his career, feeling it was his obligation and responsibility to his profession.

Even though Dave retired from the USGS about four years ago, he continued to come to the office each day to pursue his science, offering advice and counsel to his colleagues, and generally adding energy and challenge to those around him. For the past few months he has been battling advanced cancer. He recently expressed how very fortunate he felt to be immersed for the past 60 years in scientific discovery at the USGS. His colleagues and friends around the world will miss his wit and wisdom.

Randall G. Updike, USGS Former Chief Scientist, Geologic Hazards Team

Volunteers Needed for Rain and Hail Study!

In 1998, following a severe flash flood in 1997 in Fort Collins, Colorado State University launched a cooperative study of localized rainfall and hail patterns. They have enlisted literally hundreds of volunteers of all ages to help take simple measurements of rain and hail (some do snow, too). They have a neat web page, initially developed by high school students, that is used to collect reports and display results. <http://www.cocorahs.com> (cocorahs = COMMUNITY COLLABORATIVE Rain and Hail Study)

With the help of some Denver area sponsors, the study is now expanding into the Denver-Boulder area and adjacent foothills this spring and summer. High quality, high capacity rain gauges will be supplied for qualified applicants, and "hail pads" will be handed out to quantify the number and size of hailstones from each storm (see the web page for details). Enthusiastic volunteers are needed to share about 2 minutes of their time to report rain and hail. People of all ages are encouraged to participate. The study will be able to accommodate at least 150 individuals or families scattered throughout the area in order to best depict storm patterns. Volunteers can sign up on the web page. All of the data are mapped and displayed daily on the website, so even if folks don't participate, they can enjoy watching and learning from the study. Colorado Scientific Society may become an official sponsor of this project, and I hope a number of our members will volunteer time for this study. I, personally, can't wait to get my own "hail pad"! ----- **Eric P. Nelson, President**

Current USGS Colorado Geologic Research

Dave Moore (USGS — Denver) has taken a lead role in completing a series of 1:250,000-scale geologic maps that document the distribution and character of Quaternary surficial deposits in the most populated parts of Colorado. Pamphlets that accompany these maps describe the age, origin, and geologic hazards associated with the deposits at a level of detail not previously available at this regional scale. The maps depict surficial deposits, including residuum, colluvium, landslide deposits, till, outwash, alluvium, and eolian deposits. The maps provide general physical and compositional data about the surficial environment, and they document properties of deposits that should be useful for land-use planning, siting of refuse sites, transportation and utility corridor studies, aggregate resource mining, education, and regional studies of Quaternary geology. The first map, titled "Generalized Surficial Geologic Map of the Denver 1° x 2° Quadrangle," was published in 2001(MF-2347) in digital and print-on-demand formats. A second, contiguous map, "Generalized Surficial Geologic Map of the Pueblo 1° x 2° Quadrangle," is presently in editorial review. A third map, which is in the final stages of preparation, depicts the surficial geology of Colorado south of latitude 40° N and east of longitude 108° W. This map, "Quaternary Geologic Map of the Pikes Peak 4° x 6° Quadrangle" (I-1420), is scheduled to be published in the USGS Quaternary Geologic Atlas of the United States.



A View Through the Brown Cloud

by Lisa Ramirez Bader

How can you tell if someone is originally from the East Coast? Easy. In the middle of a typical Colorado snowstorm, ask them how they like the weather here. If they gush and spew, "Oh! It's so wonderful!" you can bet your family euhedral crystals they are from the East. If they grumble and moan, they're definitely from the West coast. I admit to being a grumbler. I'm sitting in my office with feet like two chunks of Iceland spar. Why should I be happy about that? Of course part of the problem is that I'm in a federal gummint office, meaning that the weather conditions inside are problematic at any time of year. This will supposedly be cured when we move to our new DFC building 25 offices in two weeks. Yes! It's true! Go buy that lottery ticket! The planets aligned and USGS pots-o'-money were half-full/empty at the same time as GSA coffers. Even Miss Cleo is hard-pressed to predict if the new offices will be inhabitable, but building weather conditions should improve since they certainly can't get worse. The good news is that I have the thermostat that controls my office and two others. My officemates don't need Miss Cleo to know that they should invest in a bikini post haste. With a maiden name like Ramirez, I can appreciate global warming!



CU Museum Seeks Members

The University of Colorado Museum of Natural History recently surveyed its membership. We discovered that several of our members are also members of the Colorado Scientific Society. Since both of our organizations have members with similar interests, we would like to invite other CSS members to join the CU Museum.

CU Museum members support the Museum and enjoy many benefits. If you would like additional information, visit the CSS web page or contact Heidi Quist at: 303 492-3396 or heidi.quist@colorado.edu.





Earth Science Meetings and Talks



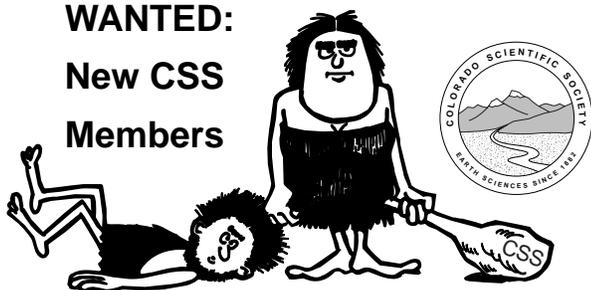
Newsletter items must be received by the 4th of each month. Items may include special events, open houses, etc...thanks!

- Colorado Scientific Society's** regular meetings are held the 3rd Thursday of the month at the Colorado Mountaineering Center in Golden (unless otherwise advertised). Social time begins at 7:00 p.m. and talks start at 7:30 p.m. For info., contact Eric Nelson at 303-273-3811, enelson@mines.edu.
- USGS Central Region Colloquium** Thursdays, 1:30 p.m., Foord Rm., Building 20, entrance W3, Denver Federal Center. For information call Laura Strickland at 303-236-5302, or email: lstrickland@usgs.gov Call for cyber talk info. March 28 - **Guidelines For Effective Model Calibration (Any Model!)** by Mary Hill, USGS/WRD.
- Colorado School of Mines, Heiland Lectures** at 4:00 p.m. on Fridays, contact Michelle Szobody 303-273-3451. Check this month's locations on website. **Van Tuyl Lectures**, March 6 - David Hyndman hyndman@msu.edu, Dept. of Geological Sciences, Michigan State University, **NGWA Darcy Lecture**, March 21 - Geoffrey Dorn, University of Colorado, Joint van Tuyl/Heiland lecture: **SEG 2002 Spring Distinguished Lecture, The Role of Visualization in Resource Exploration and Development**, March 28 - Cliff Taylor, USGS, **Greens Creek VMS, AK** Web page: http://www.mines.edu/Academic/geology/van_tuyl/van_tuyl.shtml.
- Denver International Petroleum Society (DIPS)** meets the 2nd Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Sts. Reception begins at 11:30 a.m., lunch at 12 p.m., program at 12:30 p.m. Make reservations (required) by leaving message at 303-623-5396. Reservations accepted after 8 a.m. on Friday until 10:30 a.m. on Wednesday prior to the meeting. Cancellations accepted until 11:00 a.m. Wed. prior to the meeting. Cost: \$15 for lunches; talk only is available for \$2 (make checks payable to "D.I.P.S."). Contact Keith Murray at 303-986-8554 for information. March 8 - **Contrasting Geology and Cultures: Morocco and Algeria**, Dr. John Warne, Colorado School of Mines.
- Denver Mining Club** meets every Thursday (except when noted) at The China King Restaurant, 12037 West Alameda Parkway, Lakewood, 11:30 a.m. - 1:00 p.m. March 7 - Robert Bassett, *Attorney*, Dorsey and Whitney, Denver, **New Coal Mining Opportunities in Colorado: The Lorencito Project**. March 14 - Judy Hamilton, **Consulting Groundwater and Engineering Geologist, Engineering and Environmental Aspects of the Three Gorges Dam, Yangtze River, China**. March 21 - David Vardiman, *Manager, Exploration*, Cripple Creek and Victor Gold Mining Co., **Recent Exploration Activities in the Cripple Creek Mining District, Colorado**. March 28 - Karen J. Wenrich and Peter J. "Pete" Modreski, *Geologists/Mineralogists*, USGS. **A Tale of Two Beautiful, Unique Caves - Silent Splendor in Limestone; and Clear Creek, in Granite**.
- Denver Region Exploration Geologists Society (DREGS)** meets in the Consolidated Mutual Water Company Building, 12700 West 27th Avenue, Lakewood. Social hour 6:00-7:00 p.m. Technical presentation at 7:00 p.m. Meetings are normally scheduled for the first Monday of each month. For info. contact Jim Piper, 303-932-0134, or the website <http://www.dregs.org>. Note: these meetings are at CSM Green Center. March 4th at 7:00 pm - **Mississippi Valley-Type Lead-Zinc Deposits through Geological Time: Implications from Recent Age-Dating Research**. March 5th at 12:00 - **The Giant Red Dog Shale-Hosted Zinc-Lead Deposit, Western Brooks Range, Alaska: Discovery, Geology, and Genesis**. Both talks by David Leach.
- Denver Well Logging Society (DWLS)** meets on the 3rd Tuesday of each month, Sept. through May. Lunch and a technical talk at the Wynkoop Brewery begins at 11:30 a.m., 18th and Wynkoop Sts. in Denver. Subject matter usually deals with the application of well logs to oil and gas exploration. Call Elice Wickham at 303-573-2781 for reservations. Web page: <http://dwls.spwla.org>
- Friends of Dinosaur Ridge and the Morrison Natural History Museum** 7:00 p.m. at Red Rocks Elementary School at the west end of Morrison. March 22 - **See the Stars at Dinosaur Ridge**, 7:00 pm, Dr. Dick Dietz and Jake Jacobs offer Friends of Dinosaur Ridge members an exclusive chance to view the heavens through their telescopes. Join now. Web page: <http://www.dinoridge.org/>. Call 303-697-DINO for more information.
- Rocky Mountain Association of Geologists (RMAG)** Reception at 11:30 a.m., lunch at 12:00 p.m., talk at 12:30 p.m. Reservations taken by recording at 303-623-5396 until 10:30 a.m., Wed. before the luncheon. Cancellations are taken until 11:00 a.m. on Wed. at 303-573-8621. Luncheon cost is \$20 payable to RMAG at the door. Reservations are not required for talk only---cost is \$3. Meeting location: Denver Petroleum Club, Anaconda Tower, 555-17th St., 37th floor. March 1 - **The Coalbed Methane Potential in the Upper Cretaceous to Early Tertiary Laramie and Denver Formations, Denver Basin, Colorado**, Laura L. Wray, Colorado Geological Survey. March 15 - **The Middle Jurassic Elko Orogeny - A Major Tectonic Event in Nevada-Utah**. Charles Thorman, USGS Emeritus.
- University of Colorado at Boulder, Geological Sciences Colloquium** Wednesdays, 4:00-5:30 p.m., Rm. 180. Refreshments at 3:30 p.m on the 3rd floor. For info., call 303-492-8141. Web page: <http://www.colorado.edu/GeolSci/hotlist.html>.
- For a constantly updated, online geo-calendar, visit the Colorado Geological Survey at:**
http://geosurvey.state.co.us/pubs/outreach_cal/GEOCALENDAR.htm

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

<http://www.coloscisoc.org>

**WANTED:
New CSS
Members**



Colorado Scientific Society Officers, Councilors, and Chairpersons

OFFICERS

President: Eric Nelson, CSM, 273-3811, enelson@mines.edu
President-Elect: Jim Cappa, CGS, 866-3293, jim.cappa@state.co.us
Treasurer: Don Sweetkind, USGS, 236-1828, dsweetkind@usgs.gov
Secretary: Lisa Finiol, CSM, 567-2403, lfiniol@mines.edu
Past President: Michele Tuttle, USGS, 236-1944, mtuttle@usgs.gov

COUNCILORS

2000-2002: Bob Fleming, USGS, 279-8122, juvafleming@msn.com
2000-2002: Scott Lundstrom, USGS, 236-7944, sclundst@usgs.gov
2001-2003: Graham Closs, CSM, 273-3856, lcloss@mines.edu
2001-2003: Parker Calkin, UCB, 442-2184, calkin@spot.colorado.edu
2002-2004: Jim White, UCB, 492-5494, jwhite@colorado.edu
2002-2004: John McCray, CSM, 384-2181, jmccray@mines.edu

COMMITTEE CHAIRPERSONS

Best Paper Award: Mark Hudson, USGS, 236-7446, mhudson@usgs.gov
Database Manager: Cynthia Rice, USGS, 236-1989, crice@usgs.gov
Field Trips: Emmett Evanoff, UCB, 492-8069, evanoff@colorado.edu
Graphics: Lee-Ann Bradley, USGS, 273-8613, bradley@usgs.gov
History: Marjorie E. MacLachlan, USGS-retired, 986-7192, jmemaclachlan@aol.com
Membership: Jim Yount, USGS, 236-5397, jyount@usgs.gov
Memorial Funds: Michele Tuttle, USGS, 273-8626, mtuttle@usgs.gov
Newsletter Editor: Van Williams, USGS, 236-1289, vwilliam@usgs.gov
Assoc. Editor: Scott Minor, USGS, 236-0303, sminor@usgs.gov
Assoc. Editor: Mary-Margaret Coates, TECH Edit, 422-8349, mmcoates@att.net
Assoc. Editor: Vince Matthews, CGS, 866-3028, vince.matthews@state.co.us
Outreach: Paul Belanger, Thomasson, 436-1930, p.belanger@att.net
Program: Donna Anderson, CSM, 273-3883, dsanders@mines.edu
Publicity: Mearl Webb, 810-1296, mearlwebb@qwest.net
Science Fair: Chuck Weisenberg, 238-8806, cweisnbrg@aol.com
Webmaster: Bill Wingle, 720-544-8830, wwingle@uncert.com



**** STOP!** Don't 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!!*