

Colorado Scientific Society

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

Presidential Address for 2002

by

Eric P. Nelson

Colorado School of Mines



Tuesday, December 17, 2002

American Mountaineering Center

710 10th Street (NE corner with Washington) Golden, Colorado

Social half-hour – 7:00 pm Meeting time – 7:30 pm



A Geological Excursion in New Zealand: Collisional Shortening and Drainage Divide Migration in the Southern Alps

Dr. Eric P. Nelson, *Colorado School of Mines*

New Zealand is a geologically fascinating and beautifully scenic land that is not only tectonically very active, but also serves to illustrate many of the geological processes involved in mountain building. In 2000-2001 I was fortunate to spend a sabbatical year on South Island and to study some of these processes. I will report on the general tectonics of New Zealand and will focus on river piracy that has resulted from crustal shortening adjacent to an active plate boundary. New Zealand started its rock life as part of Gondwanaland, snuggled up against Australia and Antarctica. Cretaceous rifting relieved it of this burden and produced a passive continental margin on the east coast that has been somewhat creaky ever since; 20-10 million year old volcanoes are still exposed along this coast. Subsequently, New Zealand took the form of microplates which jostled about and finally slid past one another as New Zealand evolved from being home to a transform plate boundary to an oblique collisional plate boundary, the Alpine fault. As along the San Andreas plate boundary in California, strain is distributed for at least 220 km into the plate and is expressed as faults and folds. The Alpine fault transitions into a diffuse southwest-vergent subduction zone to the south (Puysegur trench), and it splays to the northeast into a broad zone of oblique wrench faults before changing to a northeast-vergent subduction zone (Hikurangi trough) along the east coast of North Island. North Island today contains an extensional back arc region with beautiful stratovolcanoes and geothermal springs known to be modern, active mineralizing systems.

The Alpine fault is an obliquely convergent plate boundary and shows ~480 km of dextral offset and up to 25 km of vertical separation since the Miocene. The convergent component is illustrated by the 4 km-high Mt. Cook, and by impressive exposures of mylonitic garnet amphibolite thrust over Recent gravels. The Main Divide region of the Southern Alps is being progressively shortened in response to the convergent component of plate motion, and the rocks of the Main Divide region are being transported westwards towards the plate boundary. This lateral migration of the continental divide has resulted in a jog in the otherwise linear divide,

and in the capture of south-flowing streams, which became west-flowing streams. The region of the divide jog was localized in a zone of cross faulting, along which hydrothermal fluid flow concentrated, forming quartz-carbonate-(\pm Au) veins. These and other vein systems in the Southern Alps show that metamorphic dewatering in an evolving orogen contributes to the precious-metal budget of such tectonic regimes, including some of the Au placers to the east.



A Note from the President

As the end of my presidency approaches, I reflect on the society events and accomplishments of the past year. Indeed it was a good year in my estimation, and I can only begin to summarize the society's accomplishments and can only acknowledge a few of the many who contributed to a successful year. We started the year off with an inspiring Emmons lecture by the great tectonicist John Dewey, we enjoyed a first time ever wine night with Larry Meinert, and we laughed with the wit of geologist and author Sarah Andrews at family night. Student night, although not attended well this year, was a success for those students who participated. Remember, they are our future. In addition to these special events, program chair Donna Anderson arranged a great schedule of talks, culminating in November with a fascinating talk on sulfur caves by Harvey DuChene, and a thrilling talk on natural gas fields in Wyoming by John Robinson. (This last talk, rumor has it, was part of a deal made with John Robinson, who is president of Rocky Mountain Association of Geologists; John joined CSS and I joined, actually rejoined, RMAG in a gesture that may inspire others in Denver to become more involved in local geological societies).

Although field work in Peru in May prevented my attending the spring field trip to the Lyons quarry, I happily joined the 4-day fall trip to Jackson Hole on which past presidents Ken Pierce and Jack Reed were joined by Lisa Morgan as leaders. We had perfect weather, and the geology cooperated too. Although this year saw the retirement from newsletter editor of Lisa Ramirez Rukstales, she has maintained her humorous newsletter column "A View Through the Brown Cloud" (Lisa, I know you are happy to have a new name, but can't you shorten it somehow?! What about Ramstal, or Rukirez.....?). Lisa's great contribution as past editor and continued humorist is acknowledged. This year we formed an editorial board with a chief editor (Van Williams), and three associate editors (Mary-Margaret Coates, Vince Matthews, and Scott Minor). We also started an interview column that has featured such geo-stars as Tom Casadevall, Vicky Cowart, Steve Turner, and Bob Weimer.

The society's outreach program to place geological signs in the community made headway under the leadership of Paul Belanger and a committee of past presidents Bob Weimer, Bruce Bryant, and Greg Holden, and many others. Paul also started an outreach page on our website that has links to various geological sites of interest. As in the past, the Memorial Funds program of student grants was a success. We received 26 proposals from 18 universities—16 from across the United States, one from Canada, and one from Greece. The total was five more than in the previous year. Eleven grants totaling \$8750 were awarded from the Tweto, Oriel, Eckel, and Snyder funds. Contributions were made to the Colorado State Science Fair, the Community Collaborative Rain and Hail Study, and the Rocky Mountain Nature Association for its Day-Long Field Seminar series. Possibly the greatest accomplishment this year is a 10-year update of the society history document. History committee chairperson and past president Marge MacLachlan and the entire committee are acknowledged for their hard work and for making the year-end deadline. The document will soon be published on our website, and a few hard copies will also be available.

I would like to acknowledge everyone who contributed to the many successful events and accomplishments of this year. Special thanks are due a number of past presidents for helping during my presidency: Mike Machette, Michelle Tuttle, Mark Hudson, Eric Erslev, and Karl Kellogg. It is only through the hard work and participation of society officers, councilors, committees, and active members that the society continues to be successful in fulfilling its mission. As the oldest scientific and technical society in the Rocky Mountain region, the society exists to promote knowledge, the understanding of science, and its application to human needs, focusing primarily on earth science, but welcoming members with interests in all fields of science. Let's keep that mission alive and well in the future.



I wish the best of luck to incoming president Jim Cappa, who has had a long history of geological activities in Colorado (for example as a long-time employee of the Colorado Geological Survey and as president of DREGS—Denver Region Exploration Geologists’ Society), and I feel that his experience and knowledge of Colorado geology will help him guide the society well during 2003. I pledge to him all the assistance I can give.

Emmons Lecture Scheduled

Please make plans to attend the 2003 Emmons Lecture, to be given by Dr. Kevin Trenberth on a topic related to climate change. The talk will be in Metals Hall on the Colorado School of Mines campus on January 16 at 7:30pm. Dr. Trenberth is a senior atmospheric scientist and head of the Climate Analysis Section in NCAR’s Climate and Global Change Division. You may view his CV at <http://www.cgd.ucar.edu/cas/trenbert.html>.

CSS History Document Updated

The Colorado Scientific Society History document has been updated this year. The foreword to the third edition is presented here to give an idea of what this large task involved. Acknowledged are Marge MacLachlan for heading the committee, Scott Lundstrom for his work on the text, Sherman March for his work on the Field Trip section, Michelle Tuttle for her work on the Memorial Funds section, Paul Belanger for his work on the Outreach Programs, Eric Erslev for his work on the Science Fairs, Glenn Scott for his work on the fossil list, Lisa Rukstales for her work on the photos, Cindy Rice for her work on the Membership Lists, and Jack Murphy for looking over the section on the Mineral Collection.

The third edition of the History of the Colorado Scientific Society adds 10 years to the Society’s record. It relies heavily upon the first edition (1978), which was written by Edwin B. Eckel, and the second edition (1992), edited by M.N. Machette. A number of important changes have affected the society since the second edition was completed. These include a venue change for the monthly meetings to the American Mountaineering Center in downtown Golden and the evolution of the Internet. As such, the society has moved increasingly toward electronic dissemination of society information on its website (<http://www.coloscisoc.org/>) and via email distribution of the newsletter. Because of these and other changes, it was decided that an update was needed, and Marge MacLachlan headed up a committee to compile data for, and write the new edition.

Tables updated in this edition include: list of officers, list of Emmons lecturers, list of memorial fund awards, list of field trips, and list of honorary members. New additions include: a list of past President’s awards, a list of planets named for CSS members (only one so far, small planet “Pillmore”), a list of Antarctic geographic features named for CSS members, and a list of interviewees and interviewers for an interview column started in 2002 in the CSS newsletter. The Memorial and Endowment funds are further explained and updated. Public education and outreach activities are updated, and biographies of William G. (Bill) Pierce and George L. Snyder are added in the section on memorial funds. Lastly, this edition will be placed on the society website so that it will be available to all interested.

Because the Colorado Scientific Society is the oldest scientific and technical society in the Rocky Mountain region, it is very important that the society history be updated periodically. Although many early society records were either not kept or have been lost, the volunteers of the society have kept better records as time has passed, thanks to a large degree to evolution of the digital era. Thanks go to all who helped compile and write this new edition, and to those who help keep records of society activities.



Dues and Contributions for 2003

Membership dues for the coming year (2003) are now due. You will find a dues payment form in this issue of the newsletter. 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)? Any contributions made in 2002 (i.e., checks dated before Jan. 1, 2003) will be credited toward the 2002 tax year. Please remember that your entire contribution goes towards generating interest for the grants and that your contribution is 100% tax deductible since the Society is a non-profit Section 501 (c)(3) organization.

If you are uncertain of your member status or whether you owe dues, contact Don Sweetkind by phone at 303-236-1828 or by e-mail at dsweetkind@usgs.gov. Thank you to all of you who have already paid your 2003 dues (as well as overdue 2002 dues!).

Contributions Acknowledged

The Colorado Scientific Society was very pleased to receive contributions this year totaling \$2750.00 toward our geological sign outreach project. The CSS Outreach Committee, headed by Paul Belanger, is planning the first sign to be placed on top of Lookout Mountain at the Buffalo Bill's Grave site which offers a spectacular view of the Golden and northern Front Range geology. We hope to add other signs around the Front Range region, and possibly beyond. This project continues a long-standing tradition of public outreach programs undertaken by CSS. The society gratefully acknowledges contributions from Rocky Mountain Section of AAPG, Rocky Mountain Association of Geologists, Colorado School of Mines, and Colorado Geological Survey. These contributions will continue to improve geoscience education in our community.

CSS 2002 Past-Presidents' Best Paper Award

Daniel R. Muhs (USGS, Denver) was awarded the CSS best-paper award for his excellent September talk "Sand dunes on the Great Plains and their not-so-ancient history". Congratulations Dan!



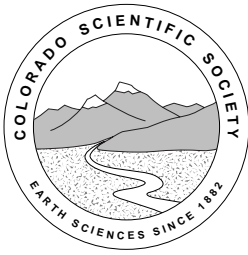
A View Through the Brown Cloud

by Lisa Ramirez Rukstales



Zounds! There is one word in the English language that sends shivers up my spine and down my rock hammer...MOVING! There can't be too many things more exhausting. Thanks to a dubious economy, interest rates have plummeted so low that even Jimmy Hoffa is relocating, so my new hubby and I decided it was time to "move up" in the housing market thanks to many factors such as the selfish desire for a two-car garage, bedrooms for the new baby arriving in

March along with "Grandma," and the obligatory hunt for "good schools." House-hunting ranks right up there with root canals on the fun meter, but moving is off the scale and can seem to induce brain damage. Why else would perfectly sane people covet cardboard boxes like the Crown Jewels? You catch yourself ogling clean boxes with the appraising eyes of an art collector. Then there's the fun of changing utilities. No, AT&T doesn't go to your new neighborhood, no, you can't keep you old phone number, yes, you're stuck with Qwest. If you haven't had to change phone service recently, count yourself as one of the chosen. You can't just call up the phone company and say, "Make it so," you must decide on service for local calls, in-state toll calls outside your local area, long distance in the U.S., and if you're unlucky enough to have foreign friends living in countries with phones, a separate "overseas" long distance service!!! I yearn for the days of that Great Monopoly....Ma Bell. She was a good ol' gal and I miss her.



2003 DUES & FUNDS CONTRIBUTIONS COLORADO SCIENTIFIC SOCIETY

(Last Name) (First Name) (Initial) (current email, if available)

DUES: Dues are for the calendar year (January-December)

Regular Members (\$15, CO Front Range) _____

Corresponding Members (\$10) _____

Student Members (\$5, enrolled in college) _____

MEMORIAL FUNDS: These funds support earth-science research grants to graduate students throughout the nation. If your contribution is not specified, it will be distributed equally among the funds:

(A) Ogden Tweto Memorial Fund _____

(B) Steven Oriel Memorial Fund _____

(C) Edwin Eckel Memorial Fund _____

(D) Bill Pierce-Heart Mountain Fund _____

(E) George Snyder Memorial Fund _____

This contribution is made in the memory of: _____

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 Colorado Scientific Society.

**Send this form
& your check to:**

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



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 information, contact Eric Nelson at (303) 273-3811, enelson@mines.edu

Denver Mining Club meets every Thursday (except when noted) at China King

12037 West Alameda Pkwy., Lakewood, 11:30 a.m.-1:00 p.m. **Precambrian Tarkwaian Gold Deposits, Ghana, West Africa**, December 5.—Thomas R. Fisher, PhD Candidate, Colorado School of Mines.

Copper Production Technology: A History of Obstacles Overcome and Human Needs Met, December 12.—Thomas G. Goonan, Mineral Information Team, U.S. Geological Survey. See past and future DMC talks at the web site: <http://www.china-resources.net>.

Denver International Petroleum Society meets the 2nd Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Streets. Reception begins at 11:30 a.m., luncheon 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 am Wednesday prior to the meeting. Cost: \$15 for lunches; talk only is available for \$2 (make checks payable to "D.I.P.S."). **"Exploration Opportunity in New Zealand," December 13**, Edgar L. Berg, Vice President - International, Thomasson Partners. Contact Keith Murray at (303) 986-8554 for information.

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water 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 information contact Jim Piper, (303) 932-0134, 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 11:30 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/>.

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 are 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. **"Deltaic Petroleum Systems - A Different Perspective,"** December 6, Peter J. McCabe, U.S. Geological Survey, Denver, CO

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/>. **A thin viscous sheet approach to Himalayan curvature**, December 4, Rebecca Bendick University of Colorado.

Friends of Dinosaur Ridge; 7:00 pm at Red Rocks Elementary School in Morrison, CO. Join now. Web page: <http://www.dinoridge.org/>.

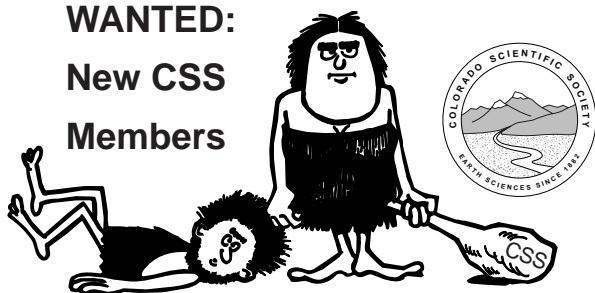
Colorado School of Mines, Van Tuyl Lectures Fridays from 3:00PM to 4:00PM in Berthoud Hall room 108: Web page: <http://www.mines.edu/academic/geology/calendar/vantuyl.html>

For a constantly updated, online geo-calendar, visit the Colorado Geological Survey at <http://geosurvey.state.co.us>

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

<http://www.coloscisoc.org>

**WANTED:
New CSS
Members**



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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

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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, pebelanger@glassdesignresources.com
Program: Donna Anderson, CSM, 273-3883, dsanders@mines.edu
Publicity: Mearl Webb, 810-1296, mf_webb@msn.com
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