



Colorado Scientific Society

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

Newsletter of the Society – May 2018

May Meeting, Tuesday, May 8, 2018, 7:00 p.m.

Annual S.F. Emmons Lecture

Social time, 6:30; program at 7:00 – all are welcome

***Ben H. Parker Student Center, Grand Ballroom
Colorado School of Mines campus, Golden CO***

From Snowball Earth to the Paleocene-Eocene Thermal Maximum: Lessons Learned from Earth System Extremes

Will Clyde, University of New Hampshire

“About 55 million years ago, the Earth burped up a massive release of carbon dioxide into the atmosphere – an amount equivalent to burning all the petroleum and other fossil fuels that exist today. “And we don’t know where it came from.”



Snowball Earth, ©MIT, from Astrobiology Magazine; Eocene mammals from “Age of Mammals” mural by Rudolf F. Zallinger, ©Yale University, from American Museum of Natural History website.

From Snowball Earth to the Paleocene-Eocene Thermal Maximum: Lessons Learned from Earth System Extremes

Abstract

We study human history to provide context for understanding the present and making projections into the future. Understanding the Earth system is no different. Reconstructing the geological past offers a window into the functioning of the Earth system over long timescales – timescales over which direct observations are impossible. In particular, by identifying and studying extreme conditions of the Earth system in deep time, we are better able to constrain Earth's boundary conditions. In this presentation, I will review the key geological evidence for several extreme events in Earth history and highlight the lessons they offer for today and the future. In particular, I will focus on the causes and effects of the Paleocene-Eocene Thermal Maximum and other early Paleogene hyperthermals. These events provide an intimate window into the feedbacks and teleconnections of the Earth system during periods of rapid global warming that thus have important implications for today.

Biography

Will Clyde is the Carpenter Professor of Geology in the Department of Earth Sciences at University of New Hampshire. He is fundamentally interested in Earth history and especially in how climate change, tectonics, and other geological forces have influenced mammalian evolution and shaped the terrestrial sedimentary record. He oversees the UNH Paleomagnetism Lab where he and his students use magnetostratigraphy to help determine the age of terrestrial fossil assemblages so they can be compared across continents and to coeval marine assemblages.

Will has been doing field work relating to the PETM in the Bighorn Basin, Wyoming, and elsewhere.



* * * * *

Why is our annual lecture named the S.F. Emmons Lecture? See the next page!

Samuel Franklin Emmons

From Wikipedia, the free encyclopedia



Samuel Franklin Emmons in 1889

Samuel Franklin Emmons (March 29, 1841 – March 28, 1911) was an American [geologist](#). He was born in [Boston, Massachusetts](#). He graduated from [Harvard University](#) in 1861 and studied at the *Ecole des Mines* in [Paris, France](#), from 1862 to 1864 and at the [Frieberg \(Saxony\) mining school](#) in 1865. In May 1867, he was appointed assistant geologist under [Clarence King](#) on the [American geological exploration of the fortieth parallel](#), and in July 1879 became geologist in charge of the [Colorado](#) division of the [United States Geological Survey](#). He traveled extensively throughout the [United States](#) in connection with his work, and in 1870 made a survey, along with [A. D. Wilson](#), of [Mount Rainier](#), the highest and most inaccessible peak in the [Cascade Range](#). The largest glacier in the contiguous United States, [Emmons Glacier](#), is located along their survey route and is named after Emmons.

During the autumn of 1872, with Clarence King, Emmons discovered the locality of the [supposed diamond fields](#) in Colorado, and was active in exposing their fraudulent character. ^{[1][2]}

Emmons is the namesake of [Mount Emmons](#), Colorado, and [Mount Emmons, Utah](#).^[3]

* * * * *

From **History of the Colorado Scientific Society 1882-2002**, on the CSS website at:

<http://coloscisoc.org/wp-content/uploads/2013/12/HistoryOfCSS.pdf>

“On the evening of December 8th, 1882, a number of gentlemen interested in the formation of a scientific association met in the rooms of the United States Geological Survey, in Denver, at the invitation of Mr. Samuel Franklin Emmons.” “Mr. Emmons, in stating the object of the meeting, said that it seemed to him that the time had come for those persons in Colorado who were interested in true science to unite in forming an association or society, whose immediate object would be to facilitate the interchange of scientific observations and ideas, and promote intercourse among the observers themselves. There should be some means of recording and publishing the many interesting and valuable facts which are daily observed in different parts of the State. This could be done through the medium of a society, and the opportunity thus afforded would no doubt act as a stimulus to some to pursue investigations in directions specially open to them.” “An informal discussion ensued in which the advisability of such a step was advocated, and it was agreed to proceed at once to form a permanent organization.” “The following named persons were unanimously chosen as officers for the first year:

President—Samuel Franklin Emmons

Vice-President—Richard Pearce

Secretary—Whitman Cross”

* * * * *



President's Message, May 2018

Blue Dot in Africa

Sometimes it can be difficult to find yourself in Africa.

When in low relief terrain surrounded by acacia bushes known as ‘wait-a-bits’ --once you are caught by their recurved thorns you must pause for a moment to detach yourself – it can be challenging to find oneself on a geologic map. The wind blows hard on your paper maps, the sun beats down on your head, and one gully looks a lot like its neighbor. But lo! In this age of digital tools we discovered geologic maps can be

loaded onto Google Earth and viewed on a cell phone....and miracles of miracles, a blue dot appears indicating your spot. Even in Africa. This was the first time we had done this, blending mapping technology, GPS satellites, and perhaps local cell coverage. The students (who are digital natives) looked at me strangely and asked: Doesn't everybody have a blue dot always?

Benefiting from the blue dot and lots of footwork our Turkana Basin geological maps are improving. In areas of rapid lateral facies changes and basin margin unconformities, there are no short cuts to mapping; beds need to be traced out individually and mapped meticulously. A long tradition of walking out correlations has been established, building on many months of outcrop tracing by Iowa State University students in the 1970's. A wonderful array of volcanic ash beds punctuate the stratigraphic record. These ash beds are hard to differentiate by field observation, but once dated or chemically fingerprinted –a set of techniques perfected by the late Frank Brown of University of Utah, they are traced laterally with great fervor. Slowly a picture is emerging of basin subsidence, river flow, and important to many, patterns of fossil and archeological site preservation. The fossils are preserved in propitious environments as elaborated on by the taphonomic research of Kay Behrensmeier and the archeological sites (some dating back to 3.3 million years) are in places (facies) where our ancestors liked to sit.

Bob Raynolds, 2018 President, Colo. Sci. Soc.

* * * * *

Surplus copies of CSS “Proceedings” + the Proceedings on our website: As we reported in the past two newsletters, Beth Simmons and Chris Morrison have been scanning and uploading to our website, complete copies of the past volumes of the Proceedings of the Colorado Scientific Society (the series, volumes 1 through 17, was published from 1883 to 1956). The society has a supply of assorted past issues of the Proceedings. Retaining about two copies of each for reference, we are making the rest available for sale to our members. The Council agreed upon an initial “members price” of \$10 per issue (each volume

consisted of several issues, each containing one to several articles; some quite lengthy, some short). As the more popular issues become depleted, we may decide to lower the price in the future for those that remain. Some of these issues were displayed at our last two meetings. Beth and Chris have completed making a complete list of all the available copies of the Proceedings; the list, indexed by title, author, and year, is posted on our website. Chris also reports that the complete volume 2 of the Proceedings (as well as volume 1, and parts of some others) is now available for free download. For all this info, see <http://coloscisoc.org/css-proceedings/> . To purchase any of the available print copies, please contact Beth (cloverknoll@comcast.net; phone 303-986-9693) .

* * * * *

CSS Meetings and Field Trips Planned for the rest of 2018:

Please make note of the dates; we'll have more info available in our next newsletter and by email:

Tues., May 8, 7:00 p.m., annual Emmons Lecture sponsored by the Colorado Scientific Society, **From Snowball Earth to the Paleocene-Eocene Thermal Maximum: Lessons Learned from Earth System Extremes**, by Will Clyde, University of New Hampshire. On the CSM campus, Ben H. Parker Student Center, Grand Ballroom.

Sat.-Sun. Sept. ____ (to be determined), CSS FALL FIELD TRIP, **"Geology of the Upper Arkansas Valley"**; to be led by Cal Ruleman & Karl Kellogg. Details and exact date TBD; it will be on one of the weekends in mid to late September. This will be a CSS version of a similar "On the Rocks" field trip planned by the RMAG for Sept. 8-9.

Thurs., Sept. 20, CSS Student Paper Night. Planned for the Arbor House, 14600 W. 32nd Ave., Golden.

Thurs., Oct. 18, 7:00 p.m., October meeting, **"Structural geology of Colorado"** by Ned Sterne, plus a possible 2nd speaker. Shepherd of the Hills Church.

Thurs. Nov. 15, 7:00 p.m., November meeting, **"Geothermal Energy"**, by Jeff Winick, DOE, plus a possible 2nd speaker. Shepherd of the Hills Church.

November ____ (plans still tentative) **CSS Family Night**, perhaps at the CSM Geology Museum.

December ____ (plans still tentative; probably Dec. 13 or 20), **CSS Annual Meeting, Potluck Dinner, and President's Address**, tentatively to be held in the Denver Museum of Nature and Science, Gates Planetarium.

* * * * *

If you've not yet done so, please renew your membership in the Colorado Scientific Society for 2018! Dues are \$25 for regular members, \$10 for corresponding members (outside the Colorado Front Range area) and \$5 for students. A Lifetime Membership is \$395.00. Mail a check to the CSS or pay with a credit card using PayPal on the CSS website, <http://coloscisoc.org/membership-payment/>. Send payments to **Colorado Scientific Society, P.O. Box 150495, Lakewood CO 80215-0495**. **For more news & information about the Society**, always check our website, www.coloscisoc.org, or see our facebook page, <https://www.facebook.com/groups/511533159044226/> .

* * * * *

Calendar of Coming Events

Tues., May 8, 6:00-8:00 p.m., “Golden Beer Talks”: Johanna Kovarik, U.S.Forest Service, National Cave and Karst Program Coordinator, “**A Life Underground: Studying and Stewarding the Magical Subterranean World of Caves**”. Windy Saddle Café, 1110 Washington Avenue, Golden. “Golden’s grassroots version of TED talks, Expand your mind with a beer in your hand”, see <http://goldenbeertalks.org/>. (Talk begins at about 6:35.)

Tues., May 8, 7:00 p.m., annual Emmons Lecture sponsored by the Colorado Scientific Society, **From Snowball Earth to the Paleocene-Eocene Thermal Maximum: Lessons Learned from Earth System Extremes**, by Will Clyde, University of New Hampshire. On the CSM campus, Ben H. Parker Student Center Grand Ballroom. All are welcome.

Thurs., May 10, 7:30 p.m., Friends of Mineralogy, Colorado Chapter, bimonthly meeting, at Lakeview Event Center, 7864 W. Jewell Ave.: “**The W-Sn-Be deposit of Xuebaoding, Sichuan Province, China: current research, past, and future of a world class mineral locality**”, by Markus Raschke, CU. All are welcome.

Sat., May 12, 9 a.m. to 3 p.m., **Dinosaur Discovery Day**, featuring **Boy Scout Day** at Dinosaur Ridge, Morrison, CO. See www.dinoridge.org for full information.

Mon., May 14, 7:00 p.m., DREGS (Denver Region Exploration Geologists’ Society) annual Distinguished Lecturer, Dr. William A. (Bill) Rehrig, “**New Discoveries, New Questions – 60 Years in Exploration Geology**”. Berthoud Hall Room 241 at Colorado School of Mines; social hour with refreshments beginning at 6:00 p.m.

Mon., May 14, 7:00 p.m., WIPS (Western Interior Paleontologists Society), Denver Museum of Nature & Science, Gates Planetarium, “**Bryozoan Strategies for Neutralizing Evolution within their Colonies**”, by Carl Simpson, Paleobiologist, CU-Boulder. All are welcome. For more information see <http://www.westernpaleo.org>.

Tues., May 15, 10:30 a.m., USGS Rocky Mountain Science Seminar, Building 25 Lecture Hall, Denver Federal Center, “**Sulfur isotopes distinguish Deccan volcanic eruptions and impact at the Cretaceous–Paleogene boundary**”, by Boz Wing, CU-Boulder. Visitors are welcome; enter Fed. Center at Gate 1 on Kipling, and enter Bldg. 25 from entrance E-14. This will be the last seminar for the 2018 year.

Sun., May 20, 12 noon to 4 p.m., **Friends of Mineralogy, Colorado Chapter, Silent Auction**, at Clements Community Center, 1580 Yarrow St., Lakewood. All are welcome.

Fri.-Sat.-Sun., June 1-3, Pikes Peak Gem & Mineral Show, sponsored by the Colorado Springs Mineralogical Society; at the Norris-Penrose Event Center [a new location], 1045 Lower Gold Camp Road #3, Colorado Springs.

Tues., June 12, WMMI (Western Museum of Mining & Industry) Speakers’ Bureau Lecture, “**An Introduction to Ore Microscopy**” by Dan Kile (USGS, retired). The lecture will begin at 7:00 pm (doors open at 6:30 pm). \$5 per person, free for museum members. Please RSVP to 719-488-0880 or email rsvp@wmmi.org. At 225 North Gate Blvd., Colorado Springs.

Tues., July 10, WMMI (Western Museum of Mining & Industry) Speakers’ Bureau Lecture, “**Colorado Fuel & Iron**”, by Victoria Miller. The lecture will begin at 7:00 pm (doors open at 6:30 pm). \$5 per person, free for museum members. Please RSVP to 719-488-0880 or email rsvp@wmmi.org. At 225 North Gate Blvd., Colorado Springs.

For more lecture series during the year see:

Colorado Beer Talks (2nd Tuesday, 6-8 p.m.), Windy Saddle Café, 1110 Washington Avenue, Golden, “Golden’s grassroots version of TED talks, Expand your mind with a beer in your hand”, <http://goldenbeertalks.org/>
Colorado Café Scientifique in Denver, monthly lectures on science topics held either at Blake Street Station or Brooklyn’s, Denver; open to the public, no charge other than refreshments you may choose to purchase; see <http://cafescicolorado.org/>.

Colorado Scientific Society (3rd Thursday, 7 p.m.), see <http://coloscisoc.org/>. Meets at Shepherd of the Hills Church, 11500 W. 20th Ave., Lakewood CO, except when noted.

CU Geological Science Colloquium (Wednesdays, 4 p.m.) see <http://www.colorado.edu/geologicalsciences/colloquium>

CSU Dept. of Geoscience Seminars (Fridays, 4 p.m.), see <https://warnercnr.colostate.edu/geosciences/geosciences-seminar-series/>

Van Tuyl Lecture Series, Colorado School of Mines, (Thursdays, 4 p.m.): <https://geology.mines.edu/events-calendar/lectures/>

Denver Mining Club (Mondays, 11:30), see <http://www.denverminingclub.org/> .

Denver Region Exploration Geologists Society (DREGS; 1st Monday, 7 p.m.), <http://www.dregs.org/index.html>

Florissant Scientific Society (FSS); meets monthly in various Front Range locations for a lecture or field trip; meeting locations vary, normally on Sundays at noon; all interested persons are welcome to attend the meetings and trips; see <http://www.fss-co.org/> for details and schedules.

Nerd Night Denver is a theater-style evening featuring usually 3 short (20-minute) TED-style talks on science or related topics; held at the Oriental Theater, 4335 W. 44th Ave., Denver; drinks are available; for ages 18+. Admission is \$6 online in advance, \$10 at the door. See <https://www.nerdnitedenver.com/> .

Rocky Mountain Map Society (RMMS; Denver Public Library, Gates Room, 3rd Tuesday, 5:30 p.m.), <http://rmmaps.org/>

Western Interior Paleontology Society (WIPS; Denver Museum of Nature & Science, 2nd Monday, 7 p.m.), <http://westernpaleo.org/> . Meetings are held either in the Ricketson Auditorium or the Planetarium at the Denver Museum of Nature & Science, unless otherwise noted

* * * * *



April & May - Where is this Rock?

I did not receive *any* responses to this picture, which was one supplied by Karen Berry to accompany the announcement of her talk at our meeting last month—illustrating CGS staff at work in the field. So I'll still keep this “open” and

invite your guesses. I'll attach a pair of new images too; one looking uphill, one down; there is a small waterfall in this rock alcove. If you know where this is, send your answer(s) to the editor, Pete Modreski, pmodreski@usgs.gov .



CSS Officers for 2018

President..... Bob Raynolds, bob.raynolds@dmns.org
President Elect..... Tom Casadevall, tcasadev@gmail.com
Past President..... Marith Reheis, 303-277-1843, marith16@gmail.com
Secretary..... Lisa Fisher, 303-215-0480, lisa.fisher@alumni.mines.edu
Treasurer..... Don Sweetkind, 303-236-1828, dsweetkind@usgs.gov

Councilors

2016-2018: Linda Barton Cronoble, lbarton1611@gmail.com, 720-338-1237
2016-2018: Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484
2017-2019: Jim Reed, jim@rockware.com
2017-2019: Chris Morrison, chris-morrison@comcast.net
2018-2020: Pete Modreski, pmodreski@aol.com, 720-205-2553
2018-2020: Matt Rhoades, rhoadesgeo1@gmail.com

Committee Chairpersons

Database Manager: Paul Morgan, 303-384-2648, morgan@mines.edu
Field Trip Chair: Cal Ruleman, 303-236-7804, cruleman@usgs.gov
GSA Meeting Co-chairs, Lisa Fisher & Libby Prueher
History Chair: Beth Simmons, cloverknoll@comcast.net
Hospitality Chair: Mary-Margaret Coates, geotechedit@gmail.com
Membership Chair: Bob Raynolds, bob.raynolds@dmns.org
Newsletter & Publicity: Pete Modreski, 303-202-4766, pmodreski@aol.com or pmodreski@usgs.gov
Outreach: Joe Mestichelli, joseph.mestichelli@gmail.com
Past Presidents' Best Paper Award, Marith Reheis, 303-277-1843, marith16@gmail.com
State Science Fair: Chuck Weisenberg, 303-238-8806, cweisnbrg@msn.com
Student Programs Chair: Melissa Foster, melissa.ann.foster@gmail.com, 707-498-2484
Student Research Grants Chair: Marith Reheis, 303-277-1843, marith16@gmail.com
Webmaster: Chris Morrison, chris-morrison@comcast.net

* * * * *

CSS outreach to public non-science groups (repeating this from an earlier newsletter... please contact us if you would like to be on our list of volunteer speakers!)

As a follow-up to our participation in the March for Science, we'd like to compile a list of members who would be willing to give an occasional lecture or presentation to non-science audiences. Groups such as neighborhood organizations, churches, social groups (Elks, Rotary, etc.) sometimes ask for speakers and it would be wonderful to have a list of knowledgeable people on whom to call. We'd like to post willing speakers and their topics on our website, so that visitors to the site could see what topics might be easily available. If you'd like to participate, please email your name and topic to Pete Modreski, pmodreski@usgs.gov , or Joe Mestichelli, joseph.mestichelli@gmail.com .

* * * * *