



Colorado Scientific Society

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

S.F. Emmons Lecture



An actively forming, and growing, gold and silver deposit worth more than a \$billion is located only ½ mile from the ship— STRAIGHT DOWN!

The Last Frontier of Silicic Pyroclastic Volcanism

Dr. Richard Fiske

Former Director, Smithsonian Institution's National Museum of Natural History

Thursday, February 17, 2005 8:00 p.m.

**Metals Hall in the Green Center Colorado School of Mines
924 16th St (between Illinois and Arapahoe) Golden**

Abstract

The last frontier of silicic pyroclastic volcanism

By Dr. Richard Fiske, Former Director, Smithsonian Institution's National Museum of Natural History

The last frontier of silicic pyroclastic volcanism is located along submarine convergent margins in present-day oceans, where many volcanologists least expected to find it. One of the best places to explore this frontier is along the front of the Izu Bonin arc, south of Japan, where nine submarine rhyolitic calderas are lined up like proverbial beads on a string. Study of these structures is just beginning, but we already know that one of them hosts a large and actively growing polymetallic sulfide deposit rich in gold and silver. All of them produced huge volumes of rhyolite pumice during their caldera-forming eruptions and, surprising to some, much of this familiar low-density material immediately sank, forming extensive sea-floor tephra deposits. These and other seeming improbabilities will be of little surprise to geologists who have studied greenstone belts and

other ancient convergent-margin terrains, where evidence for submarine silicic volcanism has long been known to abound.

Dr. Fiske's long career in volcanology continues with active research programs in Japan and Hawaii. He is a recognized authority on subaqueous pyroclastic deposits. He is senior author on the USGS professional paper and geologic map of Mount Rainier. His studies at the Hawaii Volcano Observatory have led to many areas of fruitful research including an explanation for varying dike trends in volcanic edifices. His commitment to public education was recognized by the American Geological Institute with their 2002 award for Outstanding Contribution to Public Understanding of the Geosciences.

Colorado Scientific Society President's Note—February 2005

By Vince Matthews

2005 should be a fun year for CSS. The Emmons Lecture on February 17th will feature Dr. Richard Fiske, former Director of the Smithsonian's National Museum of Natural History, speaking about exciting new discoveries on the Pacific Ocean floor. Interesting speakers are lined up for the rest of the spring—Judy Hannah, Chair of Geosciences at CSU; Steve Veatch, President of the Friends of Florissant; and Kirk Johnson, Chief Curator of the Denver Museum of Nature and Science. May 14th is set for a field trip to the Spanish Peaks and we are working on a date for the Table Mountains volcanics and their associated intrusives. Eric Nelson is working on a repeat of his successful wine tasting event.

And, then there is Family Night on April 15th! This event is truly one for the whole family, so it is scheduled for a non-school night: Friday, April 15th. We will start with a social hour at the

beautiful, new mineral museum at CSM. If you haven't visited it yet, you are in for a surprise. If you think that this is just the same old dreary collection moved to another building, then you've got another think coming. It is a fantastic display in a beautiful setting. It is so spectacular that spouses and kids (and maybe even some geologists) will not want to leave at the end of the hour. From there we will walk up the hill a block to the Student Center for a buffet dinner. After dinner, Bob Bakker, author of *Dinosaur Heresies*, and Matt Mossbrucker, Director of the Morrison Museum, will regale us with dinosaur talk. Bob is a superb artist and will sketch dinosaurs for the kids while he talks. Save that date for your whole family. I'm planning to bring my granddaughter!

If you have ideas for other activities, please contact me or one of the other council members.

Mark Your Calendars!

Colorado Scientific Society March Talks

Re-Os and S geochemistry of sulfides in black shales: implications for the rise of atmospheric oxygen *by* Judy Hannah, chair Geosciences Department, CSU.

The Princeton Scientific Expedition of 1877 to Colorado *by* Steve Veatch, president Friends of Florissant.



Photos from the Black Hills field trip, summer 2004

CSS Past President Completes New Geologic Map of North America

From the Colorado Springs Gazette

Jack Reed watched 25 years of his life - and the entire geologic history of North America - roll off printing presses late last week in Colorado Springs on broad sheets of brightly colored paper.

Reed, 73, the Denver-based scientist emeritus for the U.S. Geological Survey, is one of three geologists who spent more than two decades compiling the data that were transformed by two cartographers, Will Stettner and Linda Masonic, into a highly detailed map measuring 6 square feet.

The map was commissioned by the Geological Society of America to update the last such map, created in 1965. Reed's late father, John, also a geologist with the U.S. Geological Survey, mapped Alaska for that effort. That map was an update of the society's first geologic map, which was created in 1906.

The latest map, which depicts the geology of the Earth from the North Pole to Venezuela and from a bit of Ireland to Siberia, reflects marked advances in scientific knowledge since the 1965 geologic map. It shows the type of rock that makes up each bit of the continent and its age. The most ancient rock - 4 billion years old - is found on the coast of Greenland, which was part of northern Canada until it fractured and drifted off. The youngest rock? The sediment being deposited in the Mississippi Delta.

Using the latest scientific evidence, the map shows impact zones where asteroids struck the Earth. Among them: a giant crater in the Gulf of Mexico that is thought to have caused the extinction of the dinosaurs and another in Chesapeake Bay that wasn't discovered until a couple of years ago.

The map also shows many fault, fold and thrust zones that indicate the tectonic forces that are pulling the continent apart.

"The good news? It will be a few tens of millions of years before Los Angeles is pushed far north and down into the Aleutian Trench," said Reed, an energetic, ruddy-faced man who sat on the floor of the print shop to trace that cataclysmic journey on a copy of the map.

Thanks to recent deep-sea exploration and Reed's colleague, Brian Tucholke of the Woods Hole Oceanographic Institution, the map now depicts the geology of the sea floor, from the deep trenches - 21,000 feet - off the Aleutian Islands to the salt domes near Veracruz to the submerged canyons just off the eastern seaboard.

Cartographer Stettner said he learned a lot about the continent while manipulating the 17,000 layers of digital data needed to construct the map. "It's very impressive. You get the big picture," he said while poring over proofs of the map. "Even as a nongeologist, I started asking questions."

The 3,200 copies of the map, along with a 3-foot by 4-foot sheet containing the keys to reading it, will be sold by the geological society for \$150 each. Reed said likely buyers will include universities, government agencies and commercial interests such as oil companies, which are interested in formations on the sea floor that might indicate the presence of oil.

"It's nice to have something finished," said Reed, who compiled his part of the map while doing other work for the Geological Survey and writing two books. The books were about Precambrian rocks in the United States and the geology of the Teton Range.

Earth Science Meetings and Talks



Newsletter items must be received by the 25th 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 American Mountaineering Center 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 Vince Matthews at 303-866-3028 or vince.matthews@state.co.us

Denver Mining Club meets every Monday (except when noted) at Country Buffet near Bowles and Wadsworth (at 8100 W. Crestline Ave.) 11:30 a.m.-1:00 p.m. <http://china-resources.net>. Feb.7, An update on the international uranium industry, T. Pool. Feb. 14, Populating the business of exploration, Leigh Freeman. Feb. 28, Resource exhaustion ...", John Tilton.

Denver International Petroleum Society meets the second Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Streets. Reception at 11:30 a.m., lunch at noon, talk at 12:30 p.m. Make reservations (required) by leaving message at (303) 623-5396. Reservations accepted until 10:30 a.m. on Wed prior to the meeting. Cancellations accepted until 11:00 am Wed prior to the meeting. Cost: \$15 for lunches; talk only-\$2. Contact Keith Murray at (303) 986-8554 for info.

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 the first Monday of each month. For information contact Jim Piper, (303) 932-0137, or the website <http://www.dregs.org>. Mar. 7, "Genesis of Carlin type gold deposits-current models and future research" by Jean Cline et al. Green Center, 7 p.m., social hour 6-7 p.m.

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 noon., 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. Talk only (no reservations)—\$3. Meeting location: Denver Petroleum Club, Anaconda Tower, 555-17th St, 37th floor. Web page: <http://www.rmag.org>.

Rocky Mountain SEPM Reception at 11:30, lunch at noon, speaker at 12:30. Reservations, Dave Uhl:303-389-5092 before noon of preceding Friday. \$15.00 lunch, \$3 talk only. Wynkoop Brewing Company, 1634 18th St., Denver. Feb.22, "Seismic geomorphologies and cycle stacking-patterns within submarine fan complexes..."by Frode Hadler-Jacobsen. David.uhl@EnCana.com

University of Colorado at Boulder, Geological Sciences Colloquium Wednesdays, 4:00-5:30 p.m., Rm. 180.Refreshments at 3:30 pm on the 3rd floor. For more information, call 303-492-8141. Web page: <http://www.colorado.edu/GeolSci>.

Friends of Dinosaur Ridge Fireside chats resume in the fall. Web page: <http://www.dinoridge.org>. Admission is free, but donations are welcome. For more information please contact the FODR Visitor Center at (303) 697-3466.

Colorado School of Mines, Van Tuyl Lectures Fridays from 3:00 p.m. to 4:00p.m. in Berthoud Hall room 108. For further information, check <http://www.mines.edu/academic/geology/calendar>. Feb 11, "Bulk rock and melt inclusion geochemistry of Bolivian tin porphyry systems" by Andreas Dietrich. Feb 18, "Life on the rocks-eating and breathing at interface" by Sue Brantley.

USGS Geologic Division Colloquium. Thursdays, 1:30 p.m., Foord Room, Building 20, Denver Federal Center. For more information contact: Peter J. Modreski, U.S. Geological Survey, Denver, Colorado tel. 303-202-4766, fax 303-202-4767 email pmodreski@usgs.gov.

Colorado School of Mines, SEG-SGA Student Chapter Evaporites, Salt Tectonics and Brines: A Practical Approach. Short course, March 2-4, Berthoud Hall, CSM, \$400. Focus on mineral and petroleum exploration. Contact-dcockbur@mines.edu.

Gem & Mineral Show, Apr. 1-3, Lincoln Center, 419 W. Magnolia, Fort Collins. Admission \$3. Children <12, free. frockhounds@yahoo.com.

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

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