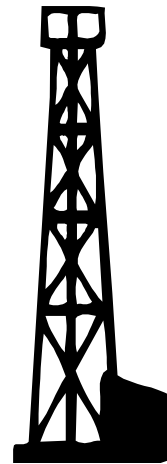


Colorado Scientific Society

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

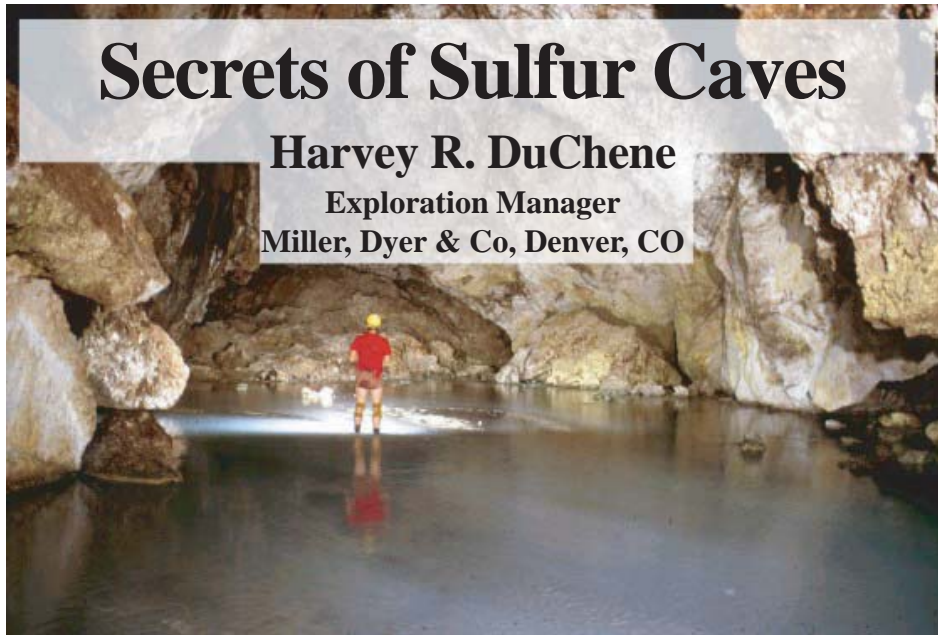
Jonah and Pinedale Fields, Green River Basin, Wyoming – Case Study of Two Emerging Giant Gas Fields



John W. Robinson,
Consultant, Littleton, CO

Secrets of Sulfur Caves

Harvey R. DuChene
Exploration Manager
Miller, Dyer & Co, Denver, CO



Thursday, November 21, 2002

Colorado Mountaineering Center

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

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



Jonah and Pinedale Fields, Green River Basin, Wyoming – Case Study of Two Emerging Giant Gas Fields

John W. Robinson, Consultant, Littleton, CO

The Jonah-Pinedale area has undergone a renaissance in the last decade to become one of the fastest growing producing trends in the Rocky Mountain region. Combined production from both fields is rapidly expanding and pipeline capacity will be hard pressed to keep up with future production growth.

Jonah Field was discovered in 1986, but due to market conditions and ineffective methods for stimulating gas release, the production was not economic. In 1992, McMurry Oil Company bought the field and used new drilling and completion technology to unlock the full potential of the play. The acquisition of 3D seismic data resulted in a revolutionary new image of the subsurface, including the existence of the Western Bounding Fault and the Southern Boundary Fault that form the boundary of the pressure compartment. In the last few years, Jonah Field has become the largest gas-producing field in the Rockies.

The first drilling activity in the Pinedale area was in 1939. In 1971 the area became widely recognized as a proposed site of an experimental subsurface nuclear blast to stimulate gas release, but the experiment never occurred. The field was dormant until the successful application of drilling and completion techniques similar to those in nearby Jonah Field revitalized the area. Recent acquisition of 3D seismic data over the anticline has generated an improved image of the structure and will allow optimization of development drilling. Estimates vary, but up to 500 wells may be drilled on the anticline when it is fully developed.

Secrets of Sulfur Caves

Harvey R. DuChene, Exploration Manager, Miller, Dyer & Co, Denver, CO

Many caves in the Guadalupe Mountains of New Mexico and west Texas contain sulfates, clays, and other minerals that are byproducts of the dissolution of limestone by sulfuric acid. Guadalupe caves such as Carlsbad Cavern and Lechuguilla Cave also contain enigmatic mineral formations with shapes that suggest that they were formed by, or nucleated around, filamentous or colonial bacteria. However, the processes that formed Guadalupe caves ceased about 4 Ma, and the characteristics of these possible life forms are unknown. To test the hypotheses that life existed in these caves while they were forming, several modern sulfur caves were studied. These include the Kane Caves of Wyoming, Cueva de Villa Luz in Mexico, the Frasassi Caves of central Italy, and Movile Cave in Romania. These caves are being formed today by the action of sulfuric acid on limestone. In addition, they support a remarkable abundance of life forms, including microbes that thrive in total darkness in low-pH environments and in an atmosphere filled with toxic gases. The life forms in these extreme environments attracted the attention of scientists who see them as possible analogs for life elsewhere in the universe.

A Note from the President

As the annual GSA meeting approached last week I was torn. On the one hand I looked forward to attending field trips before and after the meeting, and hoped for some dry sunny days in the mountains. On the other hand I wished it would snow heavily as the drought continues and the ski season looms. As it turned out, I had a wonderful, sunny, two-day field trip to view the Idaho Springs-Ralston and Homestake shear zones before the meeting, and I cancelled out of a post-meeting field trip to view pseudotachylites in the Homestake shear zone as there was probably a foot of snow on the ground in the Sawatch Range! Anyway, I am glad we finally have some moisture on the ground. In fact, I can't remember a November that started so snowy.

Emmons Lecture Scheduled

Thanksgiving is around the corner, and not far behind is 2003! Our president-elect, Jim Cappa, is already preparing for his year as president. Dr. Kevin Trenberth has accepted Jim's invitation to give the annual Emmons Lecture on a topic related to climate change. 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>.

Student Night a Success, I think.... ?

This year student night was a success in that we had participation from some excellent, intelligent young student geoscientists, who constitute the future of the geosciences community in Colorado, and hopefully some of our future leaders in the CSS. See the summary by Mark Hudson in this newsletter which outlines who won and what their talks were about. Here's the bad news: This is the second year that student night has seen reduced participation, both from students, the audience, and one major university in the Front Range area. I am very disappointed, as I would like to see more participation from students in our society because they do ultimately represent our future. One must ask, how can we encourage student participation if our non-student members do not show an adequate level of participation and enthusiasm? One suggestion, from Mark Hudson, is that we schedule the 2003 student night *after* the national GSA meeting. This might reduce the stress on all involved.

Annual Business Meeting and Presidential Address

This year the Annual Business meeting and presidential address will be held on 17 December, which is the third *Tuesday* of December. The venue will be at the American Mountaineering Center in Golden.

The topic for the Presidential Address was difficult for me to define as I am presently doing research in Australia, Peru, New Zealand, and here in Colorado. However, while living in New Zealand for a sabbatical year (2000-2001), I discovered that New Zealand offered the most beautiful scenery and amazing geology and that this would make a good theme for the presidential address. The title of the talk was then the next problem.... Was it to be "Collisional shortening and drainage divide migration in the Southern Alps, New Zealand" (pretty scientific sounding), or "A geological excursion in New Zealand" (nice and simple, won't chase away anybody not directly interested in the hard-core science), or maybe some combination, like "A geological excursion in New Zealand: Collisional shortening and drainage divide migration in the Southern Alps". Stay posted, I will have to decide for sure by the December newsletter!



Council Meets -- Ballot

The CSS Council met briefly on 24 October. The Nominating Committee (Jim Cappa, Karl Kellog, and Mike Machette), which I appointed in early October, presented the Council with nominations for next year's officers. For the 2003-2005 Councilor positions, two names appear: John Lufkin and Chuck Kluth. John and Chuck have both recently moved back into the Denver area and look forward to volunteering for the society. John Lufkin was previously a member of the teaching staff at Colorado School of Mines, and Chuck has recently retired from Chevron where he had a long career. He acted as treasurer for CSS in 1985-86. Emmett Evanoff, who has agreed to the nomination of president elect, has acted as CSS councilor and is currently our field trip chairperson. He holds a lectureship position at CU Boulder and research associate positions at CU Boulder Museum of Natural History and Denver Museum of Nature and Science. You may vote for any of these candidates either by mail (using the ballot below) or with a show of hands at the annual business meeting on December 17. Please keep in mind that regular and honorary members may nominate other candidates at the November meeting.

Ballot to Elect Colorado Scientific Society Officers for 2003

To be elected at the December 17th annual business meeting:

President Elect 2003:

_____ Emmett Evanoff

Councilors 2003-2005:

_____ John Lufkin

_____ Chuck Kluth

A conversation with Bob Weimer

by *Donna S. Anderson*

As past president (1980) and distinguished scientist, Bob Weimer needs little introduction to the membership of the Colorado Scientific Society. A Wyoming native, Bob is among a group of Rocky Mountain geologists that has had the opportunity to map, ponder and explore the geology of a frontier region during times of resource extraction and later great population growth. Bob says that he has four careers: education and research at Colorado School of Mines (CSM), advisor working with state and national policy makers, resident of his Mt. Vernon mountain community, and consultant. As a professor at CSM he educated several generations of geologists from 1957 until his "retirement" in 1983, and he maintains a strong connection with the campus. Throughout his educational career, he also contributed to the worldwide scientific communities of sedimentary and petroleum geology by offering lectures and short courses and as a visiting professor. His career as an advisor to public policy makers reflects a lifelong involvement in science for the public interest. Perhaps his "least known" career has been as a 45+ year resident and volunteer practicing water-supply sustainability from metamorphic rocks within the Mt. Vernon watershed. Our conversation focused on sustainability as it pertains to resources and population growth in Colorado and the West and the related topic of science for the public interest.

Problems facing Colorado and other western states today are directly tied to resource sustainability in the face of burgeoning population growth. Our conversation turned naturally to water resources, the current dry cycle (according to Bob, the word "drought" is a human perception), and Bob's experience as a homeowner in the Mt Vernon municipal water district. Bob's philosophy, "base your use on minimum needs and availability," is a statement supporting resource sustainability. It has been the guiding philosophy in the water district since the dry cycle of 1954-1957. During that time, the Mt Vernon community, which depends entirely on groundwater, got together to plan for the then current and all potential future "droughts." With the help of technical advisors like Bob, a committee composed of homeowners set up a land-use and groundwater development plan that required preservation of recharge area and aquifer yield through land purchase and ultimately purchase of senior water rights on a tributary stream to Bear Creek. In Bob's experience, continuity of community and a willingness to work things out were two elements that made the concept of watershed sustainability workable.



Resource sustainability is not limited to water. It also extends directly to energy resources such as natural gas, of which Colorado and other western states have a large supply. Natural gas is a unique resource in the sense that it is not processed much between coming out of a well bore and going into a home. The down side is that because natural gas is not stored in reservoirs like water, continual production drilling maintains the supply. Market dynamics of natural gas include large fluctuations in supply, demand and price. In Colorado and other states with large gas resources, the situation creates a boom and bust dynamic that hurts consumers during the boom and industry during the bust. Natural gas exploitation in Colorado and the rest of the Rockies also faces the question of how we balance our needs and desires for energy with our conflicting needs and desires for non-developed open space in the face of increasing population. Gas development issues reminiscent of those arising during the energy boom of the late 1970s have cropped up, creating contentious encounters between landowners, environmentalists, state and local governments, and the energy industry.

From 1978 to 1983, Bob was an active resource person in the Energy Minerals Field Institute (EMFI) at CSM. The EMFI was a consortium in which citizens and other private and public decision makers were involved in a sustained effort to create dialogue over conflicting land use and resource issues. With the downturn in the energy and mineral resource industries in the mid-1980s, the pressing political issues faded, and the EMFI was curtailed. However, we are in a similar position today with a great need for continued dialogue. Bob used this example to point out a cyclicity of public awareness that is driven by cycles of conflicting interests and values, which all in turn lead back to the sustainability issue. How do you make resources last and for how long? The approach to these questions involves education and dialogue. However, the difficult part is not in educating the K-12 population, which is where everybody focuses attention. The difficulty is in educating legislators, regulators and their staffs who have diverse backgrounds and must operate in the political arena, which doesn't necessarily work on a science logic basis. Public understanding of science and engineering is also part of the problem. Here then are the essences of Bob's career as an advisor to policy makers: how to foster communication among journalists and scientists and how to diminish the unhappy role that junk science has come to play in political, judicial and media arenas.

Our conversation turned to the question: What is the most significant aspect of Colorado geology? Bob views the significance in two ways: public impact and science. Public impact includes natural resources and surficial processes (natural hazards). Colorado has a long tradition of people exploring for and producing oil and gas. It has a much longer minerals history, but the minerals industry has fallen on hard times economically and environmentally. In spite of this, resource extraction still contributes over \$4 billion per year to the state economy. The Colorado Geological Survey receives funding from taxes levied on natural resource extraction, which Bob views as a sign of the State's commitment to geology. This money helps the Survey do things for those living outside the Front Range urban area, specifically in areas with potential geologic hazards that directly impact people. The State requires geologic review by the Survey of all subdivisions in unincorporated areas. Even though non-binding, this requirement makes communities aware of geology and hazards. As urban sprawl increases and leapfrogs into outlying areas, more encounters with geologic hazards are likely. In this regard, science for the public interest becomes an issue of protecting homeowners from the vagaries of surficial geologic processes that operate on the human time scale.

From a purely scientific viewpoint Bob is fascinated with the last big stratigraphic "cycle" in Colorado. Specifically he is interested in current landscape evolution from the crustal stability of Cretaceous to the orogenies since then, especially during the last 20 million years. For example, the Mosquito Fault displaces the 32 Ma Climax ore body by 7000 feet. Why did that happen? Mid-Tertiary events are becoming better dated and increasingly will yield more information bearing on current landscape evolution. Bob thinks that radiometric dating is still a big frontier in stratigraphic research. In his view, chronostratigraphy has to be coordinated with physical stratigraphy and biostratigraphy.

In our wide-ranging conversation we covered many topics, but we kept returning to the themes of sustainability and science for public policy and understanding. Hopefully, our conversation captures some of the essences of Bob's thoughts and experiences about Colorado and the west.

Colorado Scientific Society Student Night

By Mark Hudson

Last month, the Colorado Scientific Society was treated to three fine talks during its annual Student Night competition. As always, the judges had a difficult time in choosing the winner but the top honor was awarded to Paula Jo Lemonds (Colorado School of Mines) for her talk “Determining the Effects of Wastewater Pollutants on the Dillon Reservoir Watershed, Colorado, Using a Watershed-Scale Water Quality Model.” Jamey Watt and Aaron Zimmerman (Colorado State University) received honorable mention awards for their fine talks on water quality monitoring and Re-Os dating, respectively. Thanks and congratulations to these students.



Colorado Scientific Society Student Night winners, from left to right, Paula Jo Lemonds, Jamey Watt,

Jackson Hole Field Trip Report and Pictures

By Emmett Evanoff

The Colorado Scientific Society sponsored a field trip to Jackson Hole, Wyoming, September 20 to 23, 2002. The leaders were CSS past-presidents Ken Pierce and Jack Reed, and Lisa Morgan and Pat Shanks, all of the USGS. In addition to the leaders and their spouses, 22 others participated.

To view a complete report on the recent CSS field trip to Jackson Hole illustrated with several photos go to the CSS web site (<http://www.coloscisoc.org>) and follow the link to the field trip report.



A View Through the Brown Cloud

by Lisa Ramirez Rukstales



...and what a brown cloud it is! Yipe! There were a couple of days recently when I thought the turd-colored haze was following me around since it stretched from Ft. Collins to south Denver. Unpleasant! I realize now that when John Denver was talking about his “Rocky Mtn. High,” it was from carbon monoxide. My plan is to move behind the Dakota Hogback and hide for the duration. While I’m hiding I can avoid the drone of politicians calling each other names, the bleating of the Amendment 31 radio ads, and the hollow thunk of George W. beating his chest and calling for war. When did our air, politicians, and voting choices become so noisome? And why haven’t we done anything about it? Are we all so overwhelmed by talking heads and evildoers that we just roll over and play dead? I hope not. I hope that the members of the CSS and their families will continue to get out and do good works in any capacity, whether it be supporting the research of local college students, voting, volunteering, or continuing your scientific endeavors so when the hard questions come, we’ll have answers. November is the month for “thanksgiving” and it’s up to us to make sure that **everyone** has a reason to give thanks. Happy Turkey Day everybody! (Happy Tofu Day to Bob Scott and all you vegans)





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. **A Potpourri of SEC Observations Concerning Mining Companies**, November 7—**David M. Abbott**, Senior Associate, Behre Dolbear and Co., Inc., Denver, CO. **Practices Which Cause Problems in Assessing Environmental Liability for Mining Projects — A Contractor's Viewpoint**, November 14—Ron Schmiermund and Barbara Filas, Knight Piesold and Co., Inc., Denver, CO. **Copper Heap Leach Design and Practice**, November 21—Randy Scheffel, Consulting Metallurgical Engineer, Castle Rock, CO. 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."). 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. **Assessment of Unconventional Gas Resources of the Western Canada Sedimentary Basin, Mannville Fm and Equivalents - A More Promising CBM Target?**, November 15—Brian McKinstry and Garth Sloan, GTI E&P Services Canada, Inc., Calgary AB, Canada.

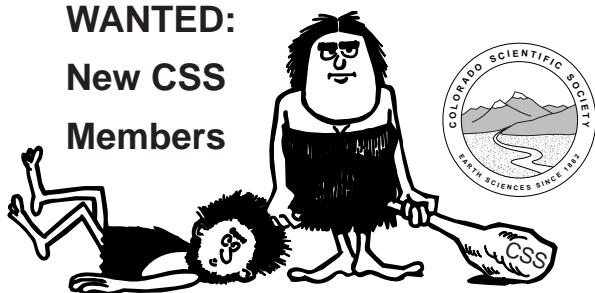
University of Colorado at Boulder, Geological Sciences Colloquium Wednesdays, 4:00-5:30 p.m., Rm. 180. Refreshments at 3:30 p.m. on the 3rd floor. For info., call 303-492-8141. Web page: <http://www.colorado.edu/GeolSci/>.

River activity and watershed uplift in the Early and Middle Pleistocene in Britain, November 6—Professor J Rose, Royal Holloway College, University of London. **Reconstructing the Front Range uplift during the Laramide Orogeny from the synorogenic rock record**, November 13—Bob Reynolds, Denver Museum of Nature and Science. **Proterozoic Snowball Earths**, November 20, A. Jay Kaufman, University of Maryland.

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: **Flood Hazards**, November 1—Perry Rahn, South Dakota School of Mines and Technology, Dept. of Geological Engineering. **Lithospheric Evolution of the Rocky Mountain Region: From the Basement Up**, November 8, Karl Karlstrom, University of New Mexico. **Vertical and Horizontal Laramide Tectonics in the Rockies: Gladiatorial Battle or Scientific Progression?**, November 15, Eric Erselev (CSU) and Vince Mathews (CGS). **Summitville, Alamosa River and a comparison to Questa and the Red River**, November 22, Dr. Geoff Plumlee, USGS. Web page: <http://www.mines.edu/academic/geology/calendar/vantuyl.html>

**WANTED:
New CSS
Members**



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