

## Colorado Scientific Society

*In pursuit of the promotion of knowledge,  
the understanding of science,  
and its application to human needs.*

### **3D Solution to a 2D Pitfall: Seismic Detection of Carbonate Buildups, Kiva Field, Paradox Basin, San Juan County, Utah**

Cindy Crawley Stewart

Kiva field produces oil and associated gas from carbonate buildups in the Upper Ismay zone of the Paradox Formation at a depth of 5,800 ft. The stratigraphic trap is formed by a lithologic change within the Upper Ismay zone from a limestone and dolomite reservoir facies to a thick offmound anhydrite facies. The estimated ultimate recovery under waterflood is 3,106 MBO + 3,689 MMcfg. Cumulative production from Kiva field as of January, 1993, is 1,991 MBO + 3,023 MMcfg.

The 1984 discovery of Kiva field was the result of a geologic model that was confirmed by conventional 2D seismic data. The seismic data was carefully processed and took into consideration the cyclic nature of the geology in the Paradox Formation.

After the confirmation well flowed 1,050 BOPD + 750 Mcfgpd from the Upper Ismay, Meridian Oil and BWAB proceeded in January 1985 to acquire a 3D seismic survey over the possible extent of the new field. The results of that survey show that the 3D images the porous part of the algal mound and demonstrates mound morphology. The survey also demonstrates that the conventional 2D strike line images the crest of the mound from out of the plane of the section (sideswipe), and the 3D migration of the data volume is able to place the image of the mound into its proper position.

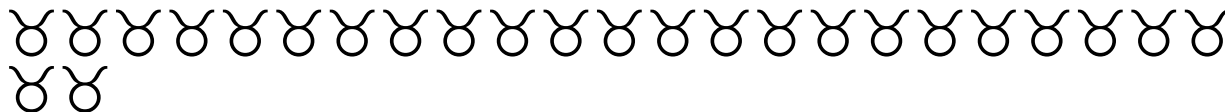
The ability to detect these prospective algal mounds using high quality seismic data makes these shallow oil reservoirs an excellent exploration target.

**In the Tracks of Hayden**

Dr. Mike Foster, author and historian

Dr. Foster will be able to join us this month after having undergone back surgery in mid-February. Fortunately, he is back in the saddle. Dr. Foster's talk retraces the surveying party of Ferdinand Vandever Hayden, which conducted the first careful government survey of Colorado between 1873 and 1876. The purpose of the Hayden Survey was to characterize the geology, natural history, and resources, and to produce maps. The Hayden Survey published a number of volumes, most notably the Atlas of Colorado, originally published in 1877 and reprinted in 1881. Dr. Foster's talk combines scenery, geology, and history, and discusses the progress of the Hayden Survey through their active years. Dr. Foster is the author of two books on Hayden and his surveying party. He will be available during the social time and break period to sign books for anyone wishing to purchase them.

## Society Notes



### Colorado Scientific Society Research Grants Available

The Colorado Scientific Society invites graduate students to apply for monetary research grants to be awarded by the Society in early May 1995. Applicants must be enrolled in a Masters or Ph.D. program at an accredited private or state college or university. Four to six grants ranging from \$500 to \$1,000 each will be awarded for field-oriented earth-science thesis projects in Colorado and the Rocky Mountain region. Also, one or more grants of \$500 to \$1,000 each will be awarded for engineering geology theses (with no areal restriction) and a study of the Heart Mountain fault in northwestern Wyoming.

Interested students can obtain grant applications from their department chair or by mail from the Chairman, Memorial Funds Committee, Colorado Scientific Society, P.O. Box 150495, Lakewood, CO 80215. **Deadline for applications is April 8.**

[--- Unable To Translate Box ---]

### New members of the Colorado Scientific Society

Welcome!!

Roger E. Knight, President, KLM Environmental  
Christine A. Staples, student member  
Bart A. Weis, student member

[--- Unable To Translate Box ---]

### Books

The History of the Colorado Scientific Society\_1882-1993 is available for \$4.00 by mail (postage and handling included within the United States) or for \$2.50 at Society meetings. If ordered by mail, please include your return address and allow 4 weeks for delivery.

[--- Unable To Translate Box ---]

### History Committee

**Field trip photo album**\_Ed Johnson (USGS, Branch of Sedimentary Processes; 303-236-7751), a member of the History Committee, is in charge of the Society's field trip photo album. Anyone who wants to contribute pictures (prints or slides) of members and guests, and of interesting localities taken on Society trips, should send them to Ed at MS 939. Please include information on the identification of all individuals, localities, and dates with each photo.

[--- Unable To Translate Box ---]

### Items for Newsletter

We would like to include any items of general interest regarding members, new programs, scientific meetings, etc., in future newsletters. Please submit materials (hardcopies and/or computer disk) to Brad Van Gosen, USGS, Box

25046, M.S. 905, Denver Federal Center, Denver, CO 80225, or call (303-236-1566) or fax (303-236-5603). Please send items to the editor before the 20th of the month to ensure inclusion in the next newsletter.  
[--- Unable To Translate Box ---]

## Earth Science Meetings



**Colorado Scientific Society.** The next regular meeting will be held on April 11, 1995, in the Green Mountain Room (second floor, southwest corner), Sheraton Hotel, 360 Union Boulevard, Lakewood, Colorado. Social time is 7:00 p.m., meeting starts at 7:30 p.m.

"Expansive soils, Heaving Bedrock and Modern Development: New Legislation for Respecting Geological Hazards in the West Denver Metro Area, Colorado" by Dr. William M. Brown III

"Predicting the Chemistry of Water Which Fills Inactive Open-Pit Mines" by Dr. Andrew Nicholson, PTI Environmental, Inc.

**Denver Mining Club.** All regular meetings are on Thursdays, from 11:30 a.m. to 1:00 p.m. at the Denver Federal Center, Building 41 Cafeteria (south entrance), Lakewood. For more information call Jane Ohl, Program Chairperson (303-237-4043).

Mar. 2 "Bed placers of Tarryall, Park County, Colorado (better known as those S.O.B.'s at Tarryall)" by George Copenhaver, Consulting Geologist and Principal, Antra Resources Corp.

Mar. 9 No DMC meeting.

Mar. 16 Talk by Miles L. (Bill) Silberman, USGS. Title to be announced.

Mar. 23 "Mining and minerals in 3-D" by Chauncey Walden, Owner, Ophir mine at Mosquito Gulch.

Mar. 30 "Touring an operating gold mine. The Hidee, near Central City, owned by Choppo Fetterhoff" by Ed Lewandowski, mine owner.

Apr. 6 Pete Parsley, USMX. To be announced.

**University of Colorado Department of Geological Sciences, Boulder.** Lectures are held on Wednesdays at 4:00 p.m. in the Geology Building, Room 121 (unless otherwise noted). For more information about lectures call Joseph Smyth (303-492-6109) or the Geology Department (303-492-8142).

**Rocky Mountain Association of Geologists.** Regular meetings, held on the first and third Fridays of each month, consist of a lunch at 11:55 a.m. and a lecture at 12:25 p.m. in the New Banquet Room of the Wynkoop Brewing

Co., 18th and Wynkoop Streets, lower downtown Denver. Cost of the luncheon buffet is \$11. Reservations are taken on a recording line (303-623-5396) until 10:30 a.m. on the Wednesday before the luncheon. Reservations are **not** necessary to attend the talk only; however, there will be a \$2 charge at the door.

Mar. 3 "Innovative Financing Alternatives for Today's Oil and Gas Ventures" by Phil Delozier, Tenneco Ventures

Mar. 17 "The Cane Creek Clastic Interval of the Pennsylvanian Paradox Formation\_An Exciting New Horizontal Target: Horizontal Drilling Technology, A Case Study" by Kenneth W. Grove, Consultant

**Rocky Mountain Section-SEPM (Society for Sedimentary Geology).** All lectures held at the Denver Press Club, downtown Denver, 1330 Glenarm Place, unless otherwise noted. Cash bar at 11:30 a.m., lunch at 12:00, speaker at 12:30 p.m. For reservations, call and leave message at 303-697-6698 by 5:00 p.m. of the Friday prior to the luncheon. For further information, call Dave Eby at 303-738-9697. Lunch reservation **not** required to attend lecture. Next luncheon to be held on March 28.

**Denver International Petroleum Society ("D.I.P.S.")**. Meetings held on 2nd Friday of the month at the Wynkoop Brewing Co., 18th and Wynkoop Streets, lower downtown Denver. Reception at 11:30 a.m., luncheon at 12:00, program at 12:30 p.m. Reservations required by calling RMAG recording line (303-623-5396). Reservations accepted after 2:00 p.m. on Friday and before 10:30 a.m. on Wednesday before the meeting. Cost: \$13.00. Contact Keith Murray, 303-986-8554, for information.

Mar. 10 "Hydrocarbon Potential of Extensional Basins Generated by Simple and Pure Shear Crustal Processes" by Charles W. Harris, Consulting Geologist.

**Colorado School of Mines Department of Geology and Geological Engineering, Golden: Van Tuyl Lecture Series.** Lectures are on Thursdays at 4:30 p.m. in Berthoud Hall, Room 108, followed by a social hour in the Fireside Lounge at the Student Center. For further information, call Greg Holden (303-273-3855) or the Geology Department (303-273-3800).

Mar. 2 Michael S. Harrington, Consultant.  
"Assessment of the developing gold industry in Russia."

Mar. 9 Spring Break - No lecture

Mar. 16 Travis L. Hudson, ARCO Coal Co.  
Manager of Remediation Technology & Support  
"Technical challenges for remediation of mine-related waste."

Mar. 23 Kenneth R. McClay, University of London.  
"3-D fault systems in rifts." (AAPG Student Chapter Sponsor; AAPG Distinguished Lecturer).

Mar. 30 Duane Smith, Ft. Lewis College.  
"Mining and the environment: A historical perspective."  
(SEG Student Chapter Sponsor).

Apr. 6 Michael West, Michael West & Assoc.

**American Institute of Hydrology – International Mine Water Association.** The next annual meeting "Water Resources at Risk" will be held on May 14-18, 1995, at the Red Lion Hotel near Stapleton Airport in Denver, Colorado. For more information, contact Joe Downey or Ed Gutentag at 303-425-0419; fax 303-425-1053; Internet e-mail address is 76330.3650@CompuServe.COM.

**Association for Women Geoscientists.** New and prospective members are encouraged to find out more about AWG. For information contact Peggy Ganse, AWG President, 303-832-9636; fax 303-832-9616.

**Friends of Dinosaur Ridge.** Friends of Dinosaur Ridge and cooperating institutions conduct guided tours for visitors to the Ridge, and many people visit on their own. In all, at least 38,000 people visited Dinosaur Ridge during 1994. Friends wishes to spread the word that they plan to accommodate all groups interested in a tour, but do need to schedule groups in advance to avoid conflict. Groups can call Friends at **303-697-DINO** to schedule a tour or for information about Dinosaur Ridge activities and location of lectures. In addition to tours of the Ridge, Friends can provide talks, lectures, and slide shows. Call Bob Kosiba at 303-399-7556 and he'll arrange a trained volunteer to speak to your group.

"Open Ridge" tours of Dinosaur Ridge will take place on the following dates during 1995. All are Saturdays except July 4th.

April 22, May 13, June 10, July 4, August 12, September 23, and October 14.

For new and present members of Friends of Dinosaur Ridge who are interested in helping as volunteer guides, two orientation training field trips to Dinosaur Ridge are scheduled: Saturday, March 25 and Saturday, April 8, 1995. Prospective volunteers may call Karen Hester at 697-DINO or 420-0059 to register.

**Teacher's Workshops.** The Dinosaur Ridge Teacher's Workshop, a two-day one-credit class about Dinosaur Ridge for teachers, will be held on April 22 and 29, and on July 10 and 11. Register with the Colorado School of Mines Continuing Education Office at 273-3303. The continuing education fee is \$85.00.

**Tracking Dinosaurs Exhibit.** A new exhibit on "Tracking Dinosaurs" opened in November, 1994 at the University of Colorado Museum, Henderson Hall, Boulder Campus (near Euclid and Broadway). The exhibit will remain open through 1995. The exhibit includes casts of iguanodon tracks newly discovered at Dinosaur Ridge during excavations of the past several years.

# **3RD ANNUAL GEOLOGIC LEGISLATIVE RECEPTION**

**HOSTED BY THE COLORADO SECTION,  
AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS (AIPG)**

**SPONSORED BY COLORADO LEGISLATORS**

**TUESDAY, MARCH 7, 1995**

**5:00pm - 7:00pm**

**ADAMS MARK HOTEL - Grand Ballroom  
(formerly the Radisson Hotel - 16th Street and Court Street)**

**THEME: Geologists Manage Resources and Lead Colorado's Evolution into a Regional and International Business Center**

This year's reception will highlight the economic contributions geologists make to Colorado. This annual event offers an excellent opportunity to meet, and interact with, your legislators and other members of state government. This year, Colorado's geologists have the opportunity to convey information about their work and their industries to many newly-elected legislators.

## **INFORMAL PRESENTATIONS BY:**

1. Vicki Cowart, State Geologist and Director, Colorado Geological Survey: "Economic contributions of Colorado's Extractive Industries"
2. Frank Waller, engineer and President of Woodward Clyde with worldwide headquarters in Denver: "Denver's Evolution into a Regional, National, and International Hub of the Environmental Industry"
3. Mike Cruson, Ph.D. and P.E., Cruson & Panszie, Golden, Colorado: "Managing International Mining Activities from Colorado"
4. Lawrence Cerrillo, CPG - 2763, Louis Berger & Associates, Evergreen, Colorado: "A Geologist's Role in Managing the Ground Water Resources from the Front Range of Colorado to Somalia"

The \$18.00 entry fee for professional geologists and others includes a drink ticket and hors d'oeuvres. To pre-register, send a check in the amount of \$18.00 per person made out to "Colorado Section, AIPG" to: Anne Weber, 1801 Broadway, Suite 350, Denver, CO 80202. For additional information, contact Anne Weber at 291-0878, AIPG Chair of the 1995 Geologic Legislative Reception.

## **USGS Environmental Geoscience Seminar Series**

This series, presented by members of the U.S. Geological Survey, includes presentations with discussion and questions to follow. The seminar series is sponsored by the Environmental Team and Center for Environmental Geochemistry and Geophysics. The talks are held 1:00-2:30 p.m. in Lecture Halls A & B, Building 25 of the Denver Federal Center, Lakewood, Colo.

- March 1 "Climate Change" by Tom Ager, Platt Bradbury, and Ian Ridley.  
April 5 "Agrogeology" by George Desborough, Larry Gough, and Pete McMahan  
May 3 "Mineral Environmental Studies" by Roger Clark, John Gray, and Sherm Marsh

[--- Unable To Translate Box ---]

### **SME Annual Meeting and Exhibit**

March 6-9

Colorado Convention Center, Denver

Sponsored by Society for Mining, Metallurgy and Exploration Inc.

Contact (303) 973-9550, fax (303) 979-3461

[--- Unable To Translate Box ---]

### **7th International Symposium on the Ordovician System**

- June 4-10 Field excursion from beach to carbonate platform to slope and basin facies. Relationship of facies to tectonics. The standard Lower Ordovician (Ibexian) for North America. Nailing down the date of the Tippecanoe Sequence of Sloss. Eugeosynclinal beds and gold. Limited to 40 persons and filling fast.
- June 12-16 Technical sessions at University of Nevada, Las Vegas. Excursion to Meiklejohn Peak on June 14.
- June 17-20 Three post symposium excursions to choose from.

Contact Dr. Margaret N. Rees, 7th ISOS, Department of Geosciences, University of Nevada at Las Vegas, Las Vegas, NV 89154. Telephone (702) 895-3890. Although the deadline for registration was January 15th, some spaces may be available on excursions.

[--- Unable To Translate Box ---]

### **SPE Joint Rocky Mountain Regional Meeting and Low Permeability Reservoirs Symposium, Denver**

March 19-22

Sponsored by the Society of Petroleum Engineers. Contact (214) 952-9393.

[--- Unable To Translate Box ---]

### **3-D Seismic Interpretation Class**

March 21-23

Presented by Dr. Alistair Brown. Held in Denver. Contact Betty Jones or John Krupa, Geo-Insight, Inc. (303) 446-0709; fax (303) 446-0228.



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

## Colorado Scientific Society

...

### OFFICERS

### COUNCILORS

President:	Susan M. Landon, Consultant, 436-1930	1993-95:	Marith C. Reheis, USGS, 236-1270
President-Elect:	Richard F. Madole, USGS, 273-8607	1993-95:	Karl S. Kellogg, USGS, 236-1305
Treasurer:	Paul L. Williams, USGS, 236-1256	1994-96:	Kathleen M. Haller, USGS, 273-8616
Secretary:	James A. Cappa, CGS, 866-2611	1994-96:	Frank J. Alder (retired)
Past President:	Jack Reed, USGS, 236-1276	1995-97:	Mark R. Hudson, USGS, 236-7446
		1995-97:	Susan Bartsch-Winkler, USGS, 236-8289

### COMMITTEE CHAIRPERSONS

...	Arrangements:	William E. Brooks, USGS, 236-5627
....	Best Paper Award:	Stephen A. Sonnenberg, Consultant, 238-8708
.	Field Trips:	Robert G. Reynolds, Consultant, 762-9379
.	Fund Raising:	David E. Eby, Consultant, 738-9697
.	History:	Marjorie E. Mac Lachlan, USGS-retired, 986-7192
.	Membership:	Mary-Margaret Coates, 422-8349
.	Memorial Funds:	Michael M. Machette, USGS, 273-8612
..	Memorial Funds Treasurer:	Vera H. Sable, USGS-retired, 526-9250
..	Newsletter Editor:	Brad Van Gosen, USGS, 236-1566
.	Outreach (signs):	Peter J. Modreski, USGS, 236-5639
..	Program:	Richard B. Wanty, USGS, 236-1819
....	Publicity:	
...	Science Fair:	Eric A. Erslev, CSU, 491-6375