GSN NEWSLETTER

April 2000, Vol. 14, No. 4

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PRESIDENT



CALENDAR OF EVENTS

Apr 5	GSN WINNEMUCCA CHAPTER 2nd Organizational Meeting, Red Lion, Winnemucca, NV; Speaker - Frank Powell, Geology of Western Areas, S. Africa. Bruce Braginton, 775/625-5606, or Peter Mitchell, 775/625-5615 for information.
Apr 14 & 28	SYMPOSIUM 2000: Organizational meeting at 12:00 noon, University Inn, UNR. Cheri Reimann, 775/358-4336.
Apr 20	GSN ELKO CHAPTER: At the High Desert Inn, Elko, NV; Speaker - William R. Petrick, Industrial Imaging Co., Inc., Depth to Basement Determination Using Gravity Data. Social-6:30, talk-7:00. Reservations not required. Jeff Pontius at 775/778-9280 for information.
Apr 21	GSN MEMBERSHIP MEETING : At Elks Club, Reno, NV; Speaker - UNR Students: Marcus Johnston and Lori Clarke with comments by Tommy Thompson. Details on
	page 3.
Apr 27	page 3. GSN SOUTHERN NEVADA CHAPTER; Lily Fong Geoscience Bldg, UNLV; UNLV Student Presentations. K. Goebel, 702/263-7600, or Jean Cline, 702/895-1091 for information.

GSN Newsletter is published monthly except June and July Geological Society of Nevada, PO Box 12021, Reno, NV 89510-2021 USA, 775/323-3500

Don't Forget to Register

GEOLOGY AND ORE DEPOSITS 2000: The Great Basin and Beyond



EXHIBITOR BADGE

Pick up an Exhibitors/Guest Badge for \$25 at the Registration Booth. The badge will provide entrance to all of the Geological Society of Nevada Symposium events located at the

Nugget except the Technical Sessions and Short Courses.

Make sure you purchase a badge so that you can take a guest to **THE BIG PARTY** sponsored by Eklund Drilling Co. and guaranteed to be FUN!

Your guest will enjoy all the great Exhibit Booths and Mineral Displays.

Thanks to Mine Development Associates and Florin Analytical Services/Kappes Cassiday & Associates for hosting the March Meeting

A Geological Society of Nevada Symposium

Reno/Sparks, Nevada, USA, May 15-18, 2000

Co-sponsored by Nevada Bureau of Mines and Geology, Society of Economic Geologists, The Association of Exploration Geochemists, and U.S. Geological Survey For more information: 775/323-4569, fax 775/323-3599 e-mail gsnsymp@unr.edu



WINNEMUCCA CHAPTER

A group of enthusiastic volunteers have stepped up to the plate and offered to involve themselves in the somewhat extensive procedure to set-up a Winnemucca Chapter of the GSN. Special recognition goes to Peter Mitchell and Bruce Braginton for their energetic participation.

The following individuals, during an informal meeting in early March, have been selected to serve as the first slate of officers. Those of you wishing to join the Winnemucca Chapter may do so at the time you complete your GSN membership renewal. Forms will also be available at the GSN Symposium May 15-18.

President, Bruce Braginton; Vice President, Mark Bradley; Secretary, Lori Clarke; Membership Chair, Travis Schwertfeger; Treasurer, Peter Mitchell; Speaker Chair, Lorne Warner; and Publications Chair, Mark Gingrich.

GSN PROPOSED OFFICERS AND DIRECTORS

The Nominating Committee is pleased to submit to the GSN membership the following officers for the GSN and the following officers and directors for the GSN Foundation:

-	
Officers:	President, Ken Cunningham Vice President, Dave Shaddrick Treasurer, Rich DeLong Secretary, Clay Postlethwaite Membership Chairperson, Greg French Publication Chairperson, Cami Prenn
Foundation Officers and Directors:	President and Director, Ken Cunningham Vice President and Director, Dave Shaddrick Treasurer and Director, Rich DeLong Secretary and Director, Clay Postlethwaite Director, Joe Kizis Director, Greg French Director, D.D. LaPointe Director, Frank Lewis

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ANNUAL GSN GOLF TOURNAMENT Sponsored by Eklund Drilling Co.

Roger Steininger, Consultant

It is time to start thinking of the annual "how many golf balls can I lose" event. The tournament will be held at Sierra Sage Golf Course on Saturday June 10, 1 P.M. tee time. A barbeque and awards ceremony will follow the playing of the golf, or killing of the rattlesnakes, whichever is fitting.

This year's tournament will have a new look to encourage a more competitive environment amongst the male participants. There has been a "handicap committee" (not Roger & Marty) formed that will make final adjustments in handicaps and pairings. So you guys can register individually or in pairs, and the "committee" will form teams. Women and couples can form teams or the "committee" will place you in an appropriate grouping. Otherwise, rules and procedures will be the same as previous years. Registration deadline is June 1.

Golf Tournament Registration Saturday, June 10, 2000			
NAME			
NK PHONE FAX			
HOME PHONE			
ADDRESS			
HANDICAP OR AVERAGE SCORE			
Cost includes greens fee, cart, prizes, and a barbeque to follow the event = $$50.00$.			
AMOUNT INCLUDED WITH THIS FORM \$			
PAID W/CHECK #			
CREDIT CARD #			
ISA MC EXP. DATE			
SIGNATURE (as it appears on card)			
NUMBER OF GUESTS EXPECTED AT BBQ			
Payment must be received by June 1, 2000, No refunds after June 1.			
Fax: 775/323-3599 or mail to GSN office: PO Box 12021, Reno, NV 89510-2021			

NEW OFFICERS!

Gregory McN. French, GSN Membership Chair

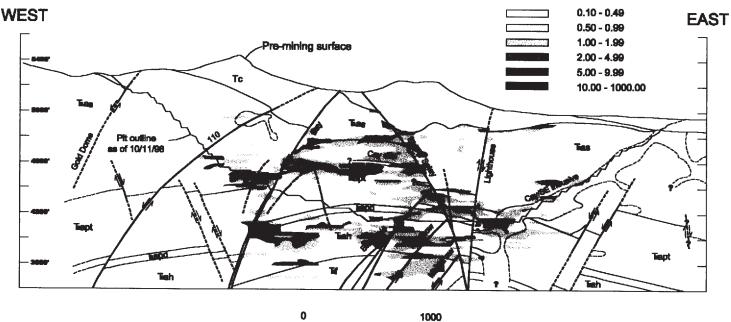
The elections are coming! The elections are coming! The elections have been moved to the April meeting. The May meeting has been canceled due to overlap with Symposium 2000. This will be the last regular meeting before the summer field season starts. I encourage members to attend the April meeting to show support for the student talks and vote for the new officers. Date: Friday, April 21, 2000 Time: Social-6:00, Dinner-7:00, Meeting-8:00 Cost: \$17.00 (dinner) Reservations: phn 775/323-3500; fax 323-3599 or e-mail: gsn@mines.unr.edu Deadline: Reserve by noon Wednesday, April 19 Location: Elks Lodge, 597 Kumle Lane, Reno, Nevada Directions: Across (W) from the Reno-Sparks Convention Center (S Virginia St), just behind the Les Schwab Tire Center Speakers/topic: Marcus K. Johnston, UNR, Lori J. Clarke, Newmont Mining Co., and comments by Tommy B. Thompson, UNR. See abstracts, p. 3-5.

Bar Hosted by Zonge Geophysics and Bondar-Clegg, Inc.

HYBRID ORE AT THE COVE GOLD-SILVER MINE, LANDER COUNTY, NEVADA: IMPLICATIONS FOR CARLIN-TYPE DEPOSITS

Marcus K. Johnston, Ralph J. Roberts Center for Research in Economic Geology Mackay School of Mines, University of Nevada, Reno

The Cove Mine is a hybrid deposit hosted dominantly by the middle to early-late Triassic Augusta Mountain Formation, a post-Sonoma orogeny passive margin sequence. Three host units have been exposed by open-pit mining: 1) the early Ladinian Home Station Member, consisting of thickly bedded silty to sandy dolomitized limestone; 2) the late Ladinian Panther Canyon Member, consisting of a lower primary dolostone submember and an upper transitional submember that grades from basal microcrystalline limestone, through middle silty limestone and calcite-cemented sandstone, to upper conglomerate; and 3) the late Ladinian to early Karnian Smelser Pass Member, consisting of medium to thickly bedded limestone with lesser carbonate shale interbeds. Ore also occurs locally in a series of Eocene porphyritic granodiorite dikes and related sills, and the entire host package is unconformably overlain by the post-mineral Oligocene Caetano Tuff.





Ag distribution relative to the W-E cross section for the Cove deposit. Au distribution is similar. Note the three stratabound occurrences in the Home Station Member (TRah), in the Panther Canyon transitional submember (TRapt) in the footwall of the Cay sill, and at the contact between the Panther Canyon transitional submember and the Smelser Pass Member (TRas). At this scale, it is impossible to accurately distinguish Carlin-style from BMVT ore distributions.

ABSTRACT (continued from page 3)

The Cove open pit has an elliptical outline, with the long axis following the N44°W trending Cove anticline. The anticline is segmented by normal faults showing four episodes of development: 1) earliest ~N-striking faults, including the Lighthouse fault array; 2) pre- and/or syn-mineralization ~NE-striking faults with steep dips and associated intrusions, including the Bay and Cay complexes; 3) pre- and/or syn-mineralization ~NE-striking faults that cut the earlier ~NE-striking faults; and 4) post-ore ~NW-striking faults, including the Striper splay off the Lighthouse fault array.

Pre-mining reserves at Cove total 3.6 million oz Au & 165 million oz Ag. Three different mineralizing systems are distinguishable. Two systems are hypogene, and consist of relatively Ag-rich Carlin-style ore and base metal vein-type (BMVT) ore. Carlin-style ore comprises disseminated Fe±As sulfides with arsenian-argentiferous-auriferous components \pm native Au-electrum in silty to sandy carbonate strata. BMVT ore comprises pyrite+sphalerite+galena-dominated veins, veinlets, crustifications, and disseminations in clastic and carbonate strata, and locally cuts the intrusions. The hypogene systems are overprinted by a later supergene system with attendant leaching and minor Ag±Cu enrichment.

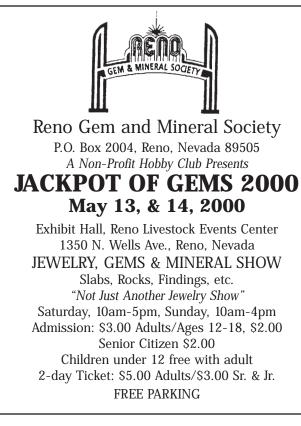
On a deposit scale, the Carlin-style and BMVT systems are difficult to separate. The strongest ore intervals for both are generally focused near the hinge zone of the Cove anticline, in a horst block between two N- and NE-striking faults. Within the horst, Carlin-style ore is dominantly stratabound within the Home Station Member and carbonate strata of the Panther Canyon Member, and occurs as irregular zones in the Smelser Pass Member. BMVT veins are generally restricted to the hinge zone of the Cove anticline, but stratabound BMVT ore dominated by veinlets, crustifications, and disseminations is widespread in the Home Station and Panther Canyon Members.

K-Ar and ⁴⁰Ar-³⁹Ar dates for fresh and altered intrusions at Cove indicate that the onset of hydrothermal alteration was essentially coeval with or just subsequent to dike and sill emplacement. Two dikes are traceable for 1.5 kilometers southwest to the ~42 Ma Brown Stock, upon which the McCoy Au-Cu skarn deposit is centered. In a district sense, McCoy and Cove can be considered as proximal and distal components, respectively, of a large magmatic-hydrothermal system. Similar zonations have been proposed for the Bingham-Barneys Canyon-Melco system in Utah, the Yauricocha District in Peru, and the Bau District in Malaysia, and clearly offer support for magmatic-hydrothermal genetic theories for the Carlin-type deposits in Nevada and elsewhere.

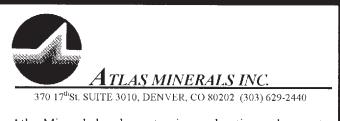
The most significant orebody mined occurred in the footwall of a large sill related to the Cay dike in the Panther Canyon transitional submember, and consisted of BMVT veins and veinlets that coalesced into stockworks and sulfide-cemented crackle breccias. Because of its wider distribution, however, Carlin-style ore is more important economically than BMVT ore.

Abstracts continued on page 5

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FOR INFORMATION CONTACT:

Gregory French, 35 N. Edison #3, Reno, NV 89502 (775) 856-2422 E-mail: GMcNFrench@aol.com

GEOLOGY AND GEOCHEMISTRY OF THE RAIN OREBODY, ELKO COUNTY, NEVADA

Lori J. Clarke, Newmont Mining Corporation Tommy B. Thompson, Ralph J. Roberts Center for Research in Economic Geology

The Rain orebody is hosted in a wedge-shaped composite breccia body in the hanging wall of the Rain fault at the unconformable contact between the Mississippian Webb Formation and the Devonian Devils Gate Limestone. Crackle breccia forms the upper periphery of the orebody, hydrothermal breccia forms the interior of the breccia body, and collapse breccia forms the floor of the breccia body. Ore is hosted predominantly in the hydrothermal breccias.

Alteration associated with the Rain orebody includes dolomitization of the Devils Gate Limestone adjacent to feeder structures, silicification of the Webb Formation, Woodruff Formation, and Devils Gate Limestone proximal to the hydrothermal breccia body and feeder structures, pyritequartz-sphalerite-barite veinlets in the hanging wall of the hydrothermal breccia body, argillization of the lamprophyre dikes proximal to the hydrothermal breccia body, and oxidation of the refractory breccias at shallow depths and adjacent to permeable structures.

Geometry and emplacement of the hydrothermal breccias are controlled primarily by the northwest-trending oblique-slip Rain Fault. Orebodies increase in area to the northwest of the open pit with the development of flower faults at a restraining bend in the Rain fault. A conjugate set of north- to northeast-trending faults influences the intensity of mineralization as well as offsets the orebody. A later set of north- to northeast-trending faults offsets the orebody. A secondary control on emplacement of the hydrothermal breccias is the favorable horizon at the unconformable contact between the Webb Formation and the Devils Gate Limestone. Oxidation of the breccias is controlled by (1) the depth of the breccia body and (2) the permeability of the breccias and the overlying units.

The Rain orebody can be divided into three paragenetic stages: passive silicification, main ore stage, and supergene. The orebody can further be divided spatially into the hanging wall, which includes the crackle breccia, and the main orebody, which includes the hydrothermal and collapse breccias. Gold was introduced as native gold, commonly encapsulated in quartz, in the passive silicification stage. Gold is also present in arsenian rims on pyrite introduced in both the passive silicification and the main ore stages.

Conduits for ore fluids can be identified by high concentrations of arsenic, mercury, antimony, phosphorus, and barium. Concentrations of these elements increase to the northwest of the open pit where flower structures have developed. The hydrothermal breccia body has anomalous concentrations of Au, As, Hg, Sb, Tl, and W. The elements Sb, Tl, W, and Ba form thin haloes above the orebody.

THANK YOU

Elizabeth Jones, GSN Education Co-Chairperson

A big thank you to the many GSN members who volunteered their time as Science Fair Judges at the Regional Science Fair at Lawlor Events Center on Thursday, March 16th. We had nearly 1000 projects to judge, and thanks to the large turn out of judges, it was accomplished with little difficulty and a lot of fun. It makes a real difference to our community to have science professionals like GSN members participating in this kind of event.

Thanks for your effort! See you next year!

SEVENTH RALPH J. ROBERTS DISTINGUISHED LECTURE IN ECONOMIC GEOLOGY

Friday, April 28, 2000, 3:00-4:00 pm

The Ralph Roberts Center for Research in Economic Geology, the Department of Geological Sciences and the Mackay School of Mines, University of Nevada, Reno, proudly announces the 7th Ralph J. Roberts Distinguished Lecture in Economic Geology, presented by David Lowell.

Subject to be announced. Lecture in Room 2030, UNR College of Education Bldg. Reception immediately following in Room 2028.

In Memoriam

12/9/19-12/11/99

The GSN regrets to report the loss of Member Charles E. Woodward, who passed away in Grand Junction, CO after a battle with cancer.

Memorial donations in his name may be sent to Mesa State College Foundation, Seventh and North Avenue, Grand Junction, CO 81501.



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MISCELLANEOUS

▶ The field trips for the GSN Symposium, May 15-18 are filling up. Don't miss your opportunity to attend one of these informative and enjoyable excursions. Register now for the symposium and the field trip of your choice!

The smile says it all: George Eliopulos and Jim Bright (background) enjoying a 1999 GSN field trip.



▶ The Dinos have NOT been edited out of existence. They've simply decided to take a sabbatical.

Thanks to **Pete Clarke** for volunteering to pack an extra GSN box to and from Toronto. How considerate!

▶ The Symposium's Big Party Committee, made up of seasoned party monsters like **Bob Hatch**, **Dave Shaddrick**, **Mario Desilets**, **Cami Prenn**, **Deb Lauder** and **Marty Dennis** (Eklund Drilling), are conjuring up one heck of a great get together Wednesday, May 17th. More details forth-coming.

MINING TERMS

The Dictionary of Mining, Mineral, and Related Terms is available on the Internet. This was originally published by the U.S. Bureau of Mines, includes over 28,000 terms and is easy to search and navigate. Check it out http://imcg.wr.usgs.gov/dmmrt/index.html

REFLECTIONS

After almost five years with the GSN, I am absolutely convinced that this is, without a doubt, one of the finest organizations in the business. The extraordinary degree of dedication, enthusiasm and generosity of spirit evident in the volunteer sector, as well as the sponsors of the Society, never ceases to amaze me.

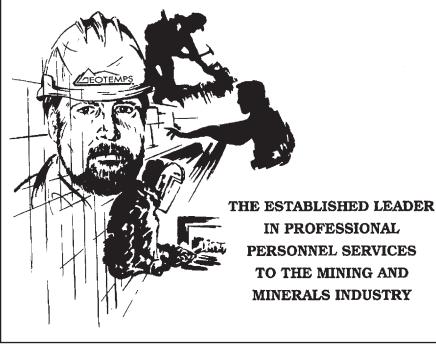
My position as Office Manager/Executive Manager of the GSN has been one of the most enjoyable, educational, and inspiring experiences of my life. But, now and then there comes a time to move on and, although it has been a tough decision, that time has come. At the end of May I'll be leaving the GSN to pursue other ventures.

I just wanted to express my appreciation to those wonderful members who have made this experience such a joy. Hope to see you at the symposium!

> De Banovich GSN Executive Manager

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UP-COMING EVENTS

Apr 10-14 Univ of Wisconsin-Madison and NV Bureau of Land Management Program, Integrated Mining & Land Reclamation Planning at Reno, NV. 925/757-7547

Apr 20 GSN Elko Chapter Meeting at Elko, NV. William R. Petrick, Industrial Imaging Co., Inc., Depth to Basement Determination Using Gravity Data. J Pontius, 775/778-9280

Apr 21 GSN Membership Meeting at Reno, NV. Tommy Thompson and UNR Students: Marcus Johnston and Lori Clarke. 775/323-3500, gsn@mines.unr.edu

Apr 25-28 Randol Gold & Silver Forum 2000 at Vancouver, B.C. 303/526-1626, www.randol.com

Apr 27 GSN SNC Meeting at Las Vegas, NV. UNLV Student Presentations. K Goebel, 702/263-7600, or J Cline, 702/895-1091

Apr 27-29 GSA Cordilleran Section 96th Annual Meeting at Vancouver, B.C. Abstracts-303/447-2020, x161, ncarlson@geosociety.org. Technical program-B Struik, 604/666-6413, bstruik@gsc.nrcan.gc.ca, D. Allen, 604/291-3967, dallen@sfu.ca, or D Thorkelson, 604/291-5390, dthorkel@sfu.ca

May 9 AEG SW Section LV Subsection Meeting at Las Vegas, NV. Pete Mote, U.S. Dept of Energy, Nevada Testing Institute's Field-Scale Earthquake Ground Motion Simulator. Social-5:30, dinner-6:30, talk-7:30. Res D Blatchford, 702/251-5449

May 10-12 CMA 2000 Annual Conf, the Odyssey Continues at Palm Springs, CA. 916/447-1977



May 15-18 Geology & Ore Deposits 2000 - The Great Basin & Beyond, A GSN Symposium at Reno/ Sparks, NV. 775/323-3500, gsnsymp@unr.edu, www.gsnv.org

May 18 CO Scientific Society Meeting at Lakewood, CO. Ren Thompson, The Self-Destructive Nature of Middle-Latitude Andean Volcanoes, and Art Snoke, Geologic Evolution of Tobago, West Indies. 303/236-7446, mhudson@usgs.gov

July 30-Aug 2 4th N American Rock Mechanics Symp, Pacific Rocks 2000: Rock Around the Rim at Seattle, WA.www.armarocks.org

July 31-Aug 3 Pacific Rocks 2000, the Fourth North American Rock Mechanics Symp at Seattle, WA. M Cramer, 303/771-2000, mcramer@expomasters.com

Aug 31st Int'l Geol Congress, Brazil 2000 at Rio De Janeiro, Brazil. 55 21 295 5847, 31igc@31igc.org.br

Sept 8-10 Nat'l Assoc of Geoscience Teachers Conference, Geology & Tectonics of the Northern Sierra NV, 7 field trips planned at Blairsden, CA. CA State Univ, E Brooks, 530/862-0415, ebrooks@csuhayward.edu

Sept 10-14 WY Geological Assoc 51st Annual Field Conf at Casper, WY. Classical WY Geology in the New Millennium. 307/268-8466, akfgeol@caspers.net

Nov 6-8 Applied Geologic Remote Sensing Integrated Solutions for Real World Problems at Las Vegas, NV. 800/582-2228, www.alexispark.com/roomres/roomres.html

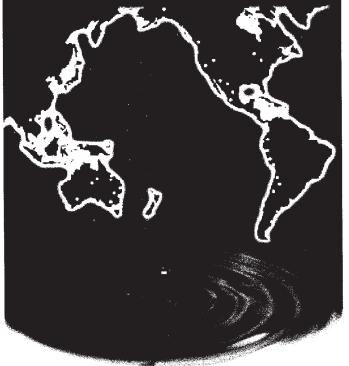
Dec 3-7 NWMA Annual Meeting & Expo at Spokane, WA. H Hoeft, 509/624-1158, www.nwma.org

2001

Sept 17-19 2001 SME Minefill 2001 at Seattle, WA. 800/763-3132 or 303/973-9550, www.smenet.org



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