That climate changes is well understood among geoscientists. What should be a static and unwavering world to most, geoscientists see as constantly changing on some scale, as documented in the rock column. Would it ever stop changing? Geoscientists peer back several orders of magnitude more days than the average Joe, the earth’s history laid before us in the pages of time that are the layers of rock (and in climate’s case, ice), like the wrinkled and hardened face of a seasoned underground miner or the soft and smooth one of a newborn. One more like the soft kind is the bug dust of August. This unwelcome partner blankets much of northern Nevada, the uppermost layer—the latest page in our history book. That layer of windblown silt that mantles hillsides and fills the playas, that obscures our ability to look back further is the Pleistocene residue of a freshwater sea. To look on northern Nevada then, with its sinuous island-ranges poking above sparkling blue waters like backbones of prehistoric ichthyosaurs would have been a sight! Lake Lahontan peaked but... (Continued on page 2)
(Continued from page 1)

a mere 12,700 years down the road, its Sehoo Highstand covering an area of over 22,000 km². Its older and fuller-figured sister to the east, Lake Bonneville, covered an area of over 52,000 km² at its peak at 15.5 ka. What change, to see the Great Basin today. The major variables controlling the demise of these spectacular lakes: temperature and precipitation, yes, climate change of the notably non-anthropogenic variety.

There is little argument that earth’s average surface temperature is warming and has been for several thousand years on the whole, despite a few short-lived cooling trends from the 13th through early 19th centuries, which resulted in small glacial advances including in our own Sierra Nevada. More difficult to reconcile is the effect we humans have on global temperature and thus, climate. No doubt, we are smarter about understanding the influences and nuances of our varied and complex climate from the hundreds of studies undertaken on the global climate in the last two decades. However, we must also recognize the differences in methodologies used to compare present with past changes in climate. The global warming debate can’t be approached strictly through Huttonian glasses. While the present is the key to understanding the past, the past isn’t what’s debated in this case. Could it be that the past is key to understanding the present in the case of global climate change?

The controversy on climate change has reached a critical point as policymakers now ponder legislation brought on by a consensual army of climate scientists and backed by an impressive and nearly unanimous group of science organizations whose collective clout make it hard to dissuade. From a societal perspective, the impact of the current climate controversy dwarfs those created by other recent scientific revolutions, specifically, those of plate tectonics and evolution. Unusual in this case are the relative lack of debate and the swiftness of adoption by generally slow-moving governments, the latter no doubt brought on by scientific urgency stemming from the magnitude of the changes in temperature and of greenhouse gas concentrations in the last 50 years. It might be that the cause cited for the precipitous spike in temperature over five decades is wrong, that a consensus of scientists from multiple disciplines is also wrong as are their predictions for the consequences. However, the hindsight right answers to the global warming question won’t creep up on us for years, well after we start feeling its socio-political impacts. As the controversy on global warming heats up, we owe it to ourselves to ask the relevant questions and assess the bases for the interpretations.

Scott Price gave a splendid and thought-provoking talk on the Battle Mountain-Eureka belt as a relatively young (i.e., late Cretaceous to Eocene) thrust-related uplift with flank collapse. Look for those older on really younger relationships. And while his talk was uplifting, so too were his commentaries on Nevadûh, including “People who don’t fit in the rest of America, end up in Nevada,” and “People who don’t fit in the Nevada, end up in Battle Mountain.” Aaah, yes, how many of us have called B-Town our home? Many thanks to Boart-Longyear for sponsoring a fine night of entertainment.

Next month’s meeting will be on October 16th and features a talk by Joe Kizis of Bravo Venture Group, Inc. on "Homestake Ridge, British Columbia: A Gold-rich, Jurassic Sub-seafloor Replacement Deposit." Be sure to catch Smokin’ Joe as he spews forth talk of bonanza grades and telescoped mineralization on a Hubble scale.

The fall field trip (November 6-8) will be heading 1,500 feet underground to Newmont’s Leeville mine and to surface tours of the Cortez district, which will address the significance of the Caetano Caldera to gold mineralization. Space is limited, so sign-up soon at www.gsnv.org/membership.html.

Finally, in celebration of its 150th anniversary, the Comstock will be on display at the Knowledge Center at UNR from now until February 2010. Events will include several exhibits of historical significance never before on public display and the Wednesday evening Comstock Conversations series during the month of October. More information is available at: www.knowledgecenter.unr.edu.
Bravo Venture Group’s Homestake Ridge Deposit, British Columbia
A Gold-rich, Jurassic Sub-seafloor Replacement Deposit
J.A. Kizis, Jr., R.W.J. Macdonald, & B. Kasper
October 2009

The Homestake Ridge property is located approximately 32 km southeast of Stewart, British Columbia. Bravo acquired the property in 2003 from Teck Cominco Ltd. and a private vendor. Through 2008, Bravo spent approximately CD$12.5 million and drilled 120 core holes (~27,200m), the majority at the Main Homestake deposit. During 2009, Bravo plans to spend ~$5 million drilling 40 additional holes (~8,500m) and conducting other work.

Lower-Middle Jurassic Hazelton Group rocks host several precious- and base-metal showings on the property and consist of andesitic to latitic volcanic rocks, tuffaceous and carbonaceous sediments, local rhyolitic domes, and multiphase feldspar-hornblende porphyry subvolcanic intrusions. Other deposits hosted in the Hazelton Group include Barrick’s rich Eskay Creek deposit, ~115km to the north and now in closure.

The Main Homestake deposit includes bonanza-grade gold/silver and is interpreted to be a sub-seafloor replacement deposit, with characteristics of porphyry, VMS, and epithermal mineralization as the system evolved. Our working model is as follows:

(Continued on page 4)
Stage 1 – Andesitic volcanic rocks are intruded by shallow intrusions and strongly altered to sericite + pyrite. These strongly altered rocks form the generally barren footwall.

Stage 2 – Rifting developed along NW-trending, steeply dipping normal “growth” faults, with subsidiary NE-trending faults that broke step-like footwall blocks further into segments. Both sets of faults appear to have guided mineralizing fluids. Limited exhalite mineralization may have formed early.

Stage 3 – The subsiding graben filled with a complex sequence of talus debris and debris flows, latitic volcanic flows, and volcaniclastics; these host most of the mineralization identified to date in the Main zone. Alteration is generally less intense than in footwall rocks, with original rock textures often well preserved.

Stage 4 – As faulting and volcanic activity decreased, widespread matrix-supported, carbonaceous debris-flow sediments covered older units. Rip-up clasts of finely banded, massive pyrite without base or precious metals occur locally in these rocks. Most precious- and base-metal mineralization probably occurred just prior to this stage at the Main zone, with local silver-rich mineralization continuing along a few structures that remained active and to the south at the Homestake Silver zone.

Stage 5 – Cobble to boulder conglomerates and basaltic flows were then deposited over debris-flow sediments. These rocks are mottled greenish gray and maroon, possibly indicating subareal deposition. Barren, late-stage rhodocrosite + calcite epithermal veins cut these and all older rocks. Textures range from finely banded to coxcomb to open vugs lined with coarse crystals. Strong alteration occurs in these rocks at Homestake Silver.

Fluids apparently followed several growth faults. In general, however, the deposit is well zoned from deeper, higher temperature to shallower, lower temperature assemblages as follows: 1) gold-rich “stringer ore” consisting of black (manganese?) chlorite + chalcopry-rite veinlets; 2) gold-rich, silica + K-feldspar flooded rock +/- copper, lead, and zinc; 3) similarly altered gold-rich rock with less base metals but more arsenic; 4) sulfosalt-rich silver +/- gold with strong antimony; 5) barium-enriched sediments; and 6) barren rhodo- crosite/calcite “epithermal” veinlets and veins above and overprinting other altered rocks.

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**Upcoming Events**

**Oct 12**
**Monday**
**6:00 PM**

The Northern Nevada Chapter of SME will be holding their monthly dinner and talk starting on Monday, Oct. 12th, 2009. The following is the topic for our meeting:

**Characterization of Arsenic Geochemistry in a Historical Mining Area Prior to New Mining Operations**

The speaker for the evening is Dr. J. Gillow, ARCADIS U.S., Inc.

The SME meeting will be held at 6:00 PM at the Circus-Circus. Email neville.rhoden@gmail.com for reservation.

Members $22
Non Members $25
Social Hour begins at 6:00 PM
Dinner starts at 6:45 PM
Technical Talk begins at 7:30 PM

**Nov. 6-8**
**Fri-Sun**

**GSN Fall Field Trip**

Featuring **Underground Tour of the Leeveille Carlin-Type Au Deposit**

See page 11 for the field trip signup form.—Space will be limited.
The Geological Society of Nevada invites you to attend our sixth symposium, *Great Basin Evolution and Metallogeny*. We strive to maintain a tradition of excellence, emphasizing descriptive accounts of ore deposits, new theories on deposit formation and innovative concepts of how to find the next district or deposit.

**Technical Sessions:**

- Carlin-Type Deposits I and II
- Great Basin Metallogeny
- Nevada Geology and Tectonics
- Discovery Case Histories
- New Mine Developments
- Volcanic-Hosted Epithermal Deposits
- Young Au-Ag Hydrothermal Systems
- Styles of Tertiary Magmatism and Metallogeny
- Exploration Geophysics
- Intrusion-Related Deposits
- Geothermal
- Rumors from the Bush—Great Basin Exploration Update
- Outta the Box—Concepts in Great Basin Geology and Ore Deposits
- Exploration Remote Sensing
- Regional Exploration Roundup
- World Exploration
- Exploration Success—Americas

**Field Trips:**

- CARLIN GOLD DEPOSITS—THREE DIFFERENT TRIPS
- EPITHERMAL DEPOSITS—TWO DIFFERENT TRIPS
- PORPHYRY AND IOGC DEPOSITS
- MODERN AND ANCIENT GEOTHERMAL SYSTEMS
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- STRUCTURAL SYSTEMATICS
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GSN Elko Chapter Meeting
October 15, 2009
“West-Vergent Thrusting on Richmond Mountain, Carlin Trend, Eureka County, Nevada”
Clay Postlethwaite,
Senior Exploration Geologist, Newmont.

The Paleozoic strata exposed in the northern Richmond Mountain uplift define an elongate, asymmetric doubly-plunging anticline with sub-vertical to overturned east-dipping strata exposed on the west limb and more gently east-dipping strata on the east limb. Structural relief, based on exposures of Eureka Quartzite at the top of Richmond Mountain, and Vinini Formation strata nearly 600 meters below on the western range front could be as much as two kilometers, although that relief includes post-mineral normal faulting of uncertain magnitude. The west-limb strata are folded into west-vergent folds and are cut by east-dipping thrusts originally mapped by Evans (1974) as the West Lynn thrust system.

Regional cross sections reconstructed using balanced cross section techniques, suggest that a thrust duplex is necessary to explain the structural relief. The Sheep Creek fault, which omits section as a moderately east-dipping normal fault, may have developed as a west-directed thrust that underwent extensional reactivation during the Tertiary. This may explain some of the problematic relationships between different strands of the Castle Reef fault.

The western continental margin of North America experienced several episodes of east-directed thrusting from middle Paleozoic to the end of Mesozoic time. Less common west-directed thrusting has been described in the Toiyabe and Toquima ranges, and the East and Humboldt Ranges. These events are generally poorly-constrained as being pre-Late Jurassic in age. Trexler et al. (2004) tightly constrain northwest-directed thrusting in Carlin Canyon as a Middle Pennsylvanian event. The west-vergent thrusting on Richmond Mountain must have preceded the intrusion of the Goldstrike stock and associated dikes at approximately 159 Ma.


GSN Winnemucca Chapter Meeting
October 14, 2009
“Copper Basin”
Justin Davenport
Geologist, Newmont. Mining Corporation

Copper Basin is located approximately 5 miles southwest of the town of Battle Mountain on the eastern flank of the Battle Mountain Range, Nevada. Copper Basin is a complex system consisting of a Mo-Cu porphyry deposit, porphyry-related Au±Cu deposits, and supergene Cu deposits. Mining in the area began in the 1860’s when copper was first discovered. Early exploration and small scale mining identified several zones of economic secondary copper mineralization with adjacent gold zones hosted in the Cambrian Harmony Formation. In the early 1960’s large scale open pit mining by the Duval Corporation and later by Battle Mountain Gold Co. further identified economic Au/Cu deposits. Mining continued in the area until the mid 1990’s recovering approximately 100 million lbs of Cu, 370,651 ozs Au, and 1.9 million ozs Ag. The property is currently owned by Newmont Mining and is being evaluated for economic Au/Cu mineralization.
I didn’t stand a chance, it was in the blood. While growing up, I was told that my Great Great Grandfather Tregaskis had sailed around the Horn in 1849 to get to the California Mother Lode Country to make his fortune (his wife walked with a wagon train). At that point, I knew I’d caught the first bit of gold fever.

When my Maternal Grandfather took me out gold panning on his Depression Era placer claim in the Klamath Mountains when I was eight, he salted my pan with some monster gold nuggets and then I was really hooked. From there on it was “rocks on a board” and “smoking volcanoes” for Science Fairs and eventually to Oregon State University in 1971. At OSU, I had the great fortune to have Dr. Cyrus W. Field as a senior advisor and had the opportunity to take his Graduate Economic Geology series which were superb. The summers allowed opportunities to work for the OSU Marine Geology Department and Homestake and Bear Creek Mining Companies and to really learn about exploration.

In 1975 I headed east to Penn State where I was going to “make my mark” getting a Ph.D. in the geochemistry of the genesis of ore deposits with some of the legends like Barnes, Burnham, and Ohmoto. It was a great learning experience, but one thing I learned was that I wasn’t a research geochemist and I opted for a Master’s working for Dr. Art Rose on a geological and geochemical exploration research project. During this period I took a couple of breaks to work for Exxon and Noranda in Washington, Idaho, and Montana searching for porphyries and massive sulfide deposits and enjoying the business.

After completing the MS degree, I took a bit of a walk-about through Yugoslavia where my PSU office mate was a Professor and had arranged tours of various base metal and uranium projects with the Yugoslav Geological Survey and then through Greece and Western Europe learning to live large on $10 a day.

After returning to the real world, I took a position with Bear Creek Mining in Spokane searching for shale-hosted Pb-Zn-Ag deposits in Washington and Idaho and headed south to Nevada just as St. Helens blew. Nevada turned out to be such a great place to work that I joined forces with two other geologists and we started up the US side of Garrett Geoservices Consulting and Wescord Exploration as a property holding company. We started out in Ely and hired most of Fort Lewis’s 1981 graduating geologists as our field crews and hit the ground running doing project management and regional exploration in the Western US and BC. After a couple of great years, we hit a down-cycle in the industry and dispersed the group, and I went into solo consulting. The consulting life can be great if you can save up enough through the good times to weather out the bad. You get to see a lot of new places, eat unusual foods, learn a lot about geology and people and hope that your spouse is patient and understanding.

The consulting years transitioned into a position with Lacana/Corona Gold with the heady days of Hemlo and Eskay Creek followed by the assimilation by Homestake. As the challenging 90s progressed, I had the opportunity to work on advanced development projects like San Cristobal, Bolivia and Getchell-Turquoise Ridge, Nevada. A brief hiatus into the Asbestos and Mold remediation world in 2000 showed me “the light” and when a contract with Placer Dome was offered I jumped at the chance. The contract with Placer continued through to the Barrick buyout and at that time I took a position with a junior miner, Bullion River Gold, where I learned more about the difficulties of mining in California than I’d ever wanted to know. I accepted my position with Kinross Gold in 2007 as the Nevada Exploration Project geologist and have been enjoying the Company and the great team of people ever since. Life is Good.
Jason Craig is the Local Name to Watch in Kayaking

On September 6th in Thun, Switzerland, Reno’s Jason Craig (16yrs) won the International Canoe Federation’s World Championships in freestyle kayaking in the junior men’s division (15-18 yrs). The event occurred over two weeks of formalized training schedules that lead into preliminary, semifinal and final completion rounds where Jason crushed his fellow competitors round to round.

Jason was born into a family of adventurers. His uncle Steven Craig (consultant) started the family in white water sports back in Colorado in the late 1960’s and was making kayaks for his friends and family by the early 1970’s. Subsequently, he got his entire family and many others into the sport during those years. Steven’s brothers, Kim (Barrick Gold) and Lindsay (Jason’s dad at AuEx Ventures) both developed skills in kayaks by the mid 1970’s and many family-kayaking adventures have been hatched since.

Jason learned freestyle kayaking over the past five years with the manufacture of kid’s kayaks and the concurrent development of the Reno Whitewater Park where he now lives. Prior to this time, Jason had been on many river trips across the west in canoes, rafts and old-style kayaks that were really too big for him to fully enjoy. Since then, his passion for freestyle grew because of his family’s encouragement, love of the sport and a strong desire to push the sport competitively. He is currently working his way through

Photo Courtesy: University of Nevada, Special Collections

On this 150th anniversary of the discovery of the Comstock Lode, exhibits in UNR’s Mathewson-IGT Knowledge Center portray life in the Virginia City area through writings, business records, photographs, and other rare items from the University Libraries’ Special Collections that have never been on display. Exhibits are available from October 2009 through February 2010. To enhance your appreciation of the Comstock Era, join us for evening “conversations” with noted local experts each Wednesday evening in October. For details, visit www.knowledgecenter.unr.edu<http://www.knowledgecenter.unr.edu>. Admission: Free
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GSN Board of Directors Summer Quarterly Meeting

The first GSN Board of Directors’ quarterly meeting for the 2009/2010 fiscal year was held on August 20, 2009 in Elko, Nevada. The Board attempts to meet outside of Reno in Elko or Winnemucca one or two times a year in order to develop a closer and better relationship with the respective chapter and its members.

Among the ten members attending the summer meeting were newly designated one year term members Matt Hofer, President of the Winnemucca Chapter, Jim Essman, President of the Elko Chapter and Mike Ressel, President of the GSN. Also attending were newly elected three year term members Kim Craig from Winnemucca and Lynne Volpi from Elko.

Highlights of the reports from the six Board Committees include the following:

Dave Caldwell of the GSN Foundation Oversight Committee reported the only fund raising activity during the summer was the $1,440 raised from mulligan shots during the GSN golf tournament. Current assets in the Foundation are $255K.

Cami Prenn of the Fiscal Committee reported GSN’s investment portfolio was successively moved to Wachovia under Eric Smith’s management. His intent is to greatly diversify the GSN portfolio.

Dave Shaddrick of the Policy Committee discussed the need for coordinating fund raising efforts so that the same contributors are not constantly being asked to donate. Coordination is especially needed this fiscal year between the normal fund raising associated with GSN field trips, directory, foundation, etc and the GSN Symposium, which is scheduled for May, 2010. The goal is find new sponsors for GSN activities particularly from Winnemucca and Elko.

Marcus Johnston informed members of the Nominating Committee to be prepared for nominating future officers and Board members by April, 2010.

Kim Craig of the Audit Committee is preparing to audit GSN’s finances for fiscal year 2008/2009.

Dieter Krewedl of the Symposium Oversight Committee presented Nancy Wolverson’s status report of the 2010 GSN Symposium, which includes plans to have the schedule “complete” and registration to begin by early October. There are over 90 oral presentations scheduled, nine field trips planned and at least 50 poster abstracts submitted.

The meeting was especially beneficial in promoting communication between the GSN “mother-ship” and its Chapters with each President giving an update of his group’s activities. Mike Ressel expressed appreciation of working with this year’s GSN Executive Committee members, reviewed the fall field trip and discussed the 2010 membership drive, which will begin in September. Matt Hofer and Jim Essman discussed a potential joint Winnemucca/Elko Chapters field trip and the Winnemucca GSN chapter is celebrating its tenth anniversary this year.

The next Board meeting is scheduled for Wednesday, November 11 in Winnemucca just prior to the Chapter’s monthly meeting. The Board always appreciates input from the GSN members on any issues they want to be discussed or are currently under consideration.

GSN members are encouraged to go to the GSN web site at www.gsnv.org to learn more about the activities of the GSN and, in particular, the Board of Directors, the Executive Committee, the Foundation, and its Chapters.
A Volunteer is needed from the GSN membership to be “Road Log Editor” for guidebooks for the Symposium 2010 field trips.

The task is to update existing logs for the nine planned field trips, which will entail tracking down updates on mines and significant exploration projects. Some of the updates will affect several road logs; thus, one person is sought to minimize the overall effort.

Contact Joe Kizis (775-746-3780 or jkizis@sbcglobal.net) if you are interested.
Geological Society of Nevada
2009 Fall Field Trip
Carlin-Type Gold Deposits: by Daylight, by Caplight, and by the Caetano Caldera
November 6-8, 2009

The fall field trip will visit two Carlin-type gold mines, the Leeville mine on the Carlin trend, and the Pipeline mine on the Battle Mountain-Eureka trend, and examine the geology of the Caetano caldera adjacent to the Pipeline and Cortez Hills deposits. The field trip provides an opportunity to tour Carlin-types deposits being mined underground (Leeville) and by open-pit (Pipeline), to get recent developments on a large deposit under development (Cortez Hills), and to hear firsthand about the current investigation of the Eocene Caetano caldera and its stratigraphic, temporal, and structural relationships to gold deposits of the Cortez district.

Friday, Nov. 6th 1:30 PM
Depart from Reno (UNR north parking lot); overnight in Elko with an evening overview presentation on the Carlin Trend

Saturday, Nov. 7th
Tour Newmont’s underground Leeville mine with Sean McCann followed by a narrated surface tour of geologic features and mines along the Carlin trend; overnight in Elko with evening presentations on Pipeline, Cortez Hills, and the Caetano Caldera

Sunday, Nov. 8th
Tour Barrick’s open pit Pipeline mine with Kevin Creel followed by examination of the eastern end of the Caetano caldera near Cortez Hills

Because of logistics of the underground mine tour at Leeville, the field trip will be limited to 40 participants. Participants are encouraged to bring personal hard hats, safety glasses, and protective boots; lamps and rescuers will be provided at Leeville but the availability of other required safety equipment at the mines is limited.

Payments must be made by October 29, 2009
No refunds after October 29, 2009

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*Non-members are encouraged to become members of the GSN for $50 annual dues in order to take advantage of the reduced rate.

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