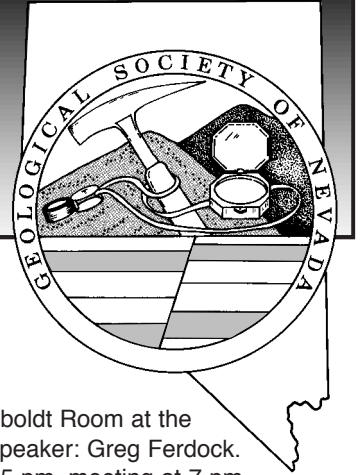


# GSN NEWSLETTER



January 2002, Vol. 16, No. 1

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## CALENDAR OF EVENTS

**Jan 10  
Thursday**

**WINNEMUCCA CHAPTER MEETING:** Humboldt Room at the Red Lion Hotel/Casino, Winnemucca, NV. Speaker: Greg Ferdock. Topic: Minerals of Nevada. Bar opens at 6:45 pm, meeting at 7 pm. Contact Sheila Bunch, sbunch@lambdacom.com, 775/623-0202.

**Jan 17  
Thursday**

**ELKO CHAPTER MEETING:** Western Folklife Center (**NOTE CHANGE**), Elko, NV. Speaker: Ted Theodore, USGS, Menlo Park, CA. Topic: Northern Carlin Trend Geochemistry. Refreshments at 6:30 pm. Contact Leslie Creel, 775/468-4400.

**Jan 18  
Friday**

**GSN MEMBERSHIP MEETING:** Reno Elks Lodge, Reno, NV. Speaker: Steve Garwin, Newmont Mining Corp., Elko, NV. Topic: The Geologic Setting of Intrusion-related Hydrothermal Systems near the Batu Hijau Porphyry Copper-Gold Deposit, Sumbawa, Indonesia. Social-6 pm, dinner-7 pm (\$17), talk-8 pm. Contact Laura Ruud, 775/323-3500, email: gsn@mines.unr.edu.

**Jan 24  
Thursday**

**SOUTHERN NEVADA CHAPTER MEETING:** Lilly Fong Geoscience Building, Rm 102, UNLV, Las Vegas, NV. Speaker: Nick Saines, Consulting Hydrogeologist, Las Vegas, NV. Topic: Lost Afghanistan. Social-5:30 pm. Contact Chris Riecken, 702/435-5664.

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

## FROM THE PRESIDENT

Dave Shaddrick, GSN President 2001-2002

### HAPPY NEW YEAR

Well, we've finished up another year and a new one brings a whole new world of opportunities. The GSN is in the middle of it's meeting and fiscal year and everything is functioning pretty much as it is supposed to.

The past calendar year has been a good one for GSN. All of our events went off well and were enjoyed by everyone who attended. Barring any major catastrophes I expect this will continue through the upcoming year.

Our membership has not collapsed as predicted by some "doom and gloom" merchants. Greg French tells me that membership is down only slightly from last year and only a few hundred below our all time high. Many are choosing to remain members even though they have moved away and even out of geology. There is something to be said for staying in touch with old friends and with a profession that is truly the "first love" for many of us.

Dues and publication sales, which are our primary source of income, are doing fine, the organization remains financially sound and we are on track with the annual budget. Cami Prenn has been working very hard to organize and summarize the complex finance and accounting issues related to the end of Symposium 2000 and the 2000 – 2001 fiscal year. She will be reporting on this in the next couple of months.

continued

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## News and Announcements

### FROM THE PRESIDENT continued from page 1

Bob Thomas put on a great field trip in the fall but wait until you open this newsletter and see what he has planned for the spring. This one will be a real standout. I recommend getting a reservation early.

For the remainder of the meeting/fiscal year things will go along pretty much as usual. The executive committee has been working on some procedural and housekeeping changes to the bylaws and you will see the details of those in the next couple of months. We hope to present the changes for a vote of the membership before the end of the meeting year.

Programs for the remainder of the year are shaping up well – just a bit slowly. “Mergeritus” is having it’s effect on everyone. And, believe it or not, it’s time to start work on Symposium 2005.

Finally, in case any of you missed it, one of the funniest events of the year was when one of our members submitted a plan of operations to the BLM and they blew it up! Talk about explosive issues! Check with Steve Craig for the full story.

### SPRING 2002 GSN FIELD TRIP

The spring field trip is coming together, with plans to focus on Jurassic magmatism, hydrothermal alteration, and metal deposits in western Nevada. Tours of the Yerington District and the Humboldt Mafic Complex are currently being lined up. John Dilles, David Johnson, and Mark Barton will be participating. These folks have completed considerable recent work in these areas, and we are fortunate to have their participation. The trip is currently scheduled for June 15-16. This date is a little later in the year than our normal spring trip, but it turns out to be the best collective time for our field trip leaders. We’d like to welcome additional papers for the field trip guidebook. We are particularly interested in regional geologic contributions, however small or large. Interested contributors should contact Bob Thomas at 775-331-4032, or email [rdtxplore@charter.net](mailto:rdtxplore@charter.net). We have the ingredients for a great trip, and additional paper contributions will make it even better.

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“Geological time is not money.”

Mark Twain

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The GSN Foundation wishes to thank the following new Founding Donors for their support:

**“Silver” Level**

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**“Donor” Level**

Kelvin Buchanan

Gregory McN. French

Eric Lauha

Robert W. Schafer

W.L. Wilson

### NEVADA BUREAU OF MINES & GEOLOGY Publications Available

The following publications are now available in the Publication Sales Office (SEM 310):

**L-8** - Oil and gas wells drilled in Nevada since 1907 (November 2001 update): Ronald H. Hess, David A. Davis, and Karen Boldi \$8.00 printout or free at <ftp://ftp.nbmjg.unr.edu/pub/web/oil.htm>

**MI-2000** - The Nevada mineral industry 2000 (2001) \$5.00 or free at [www.nbmjg.unr.edu/mi/00.pdf](http://www.nbmjg.unr.edu/mi/00.pdf)

The following publications are now available for viewing in the Information Office (SEM 311):

**USGS OFR 99-250** - Selected ground-water data for Yucca Mountain region, southern Nevada and eastern California, through December 1998 by Glenn L. Locke (2001)

**USGS OFR 00-479** - Selected ground-water data for Yucca Mountain region, southern Nevada and eastern California, through December 1999 by Glenn L. Locke (2001)

**USGS OFR 01-351** - Facies analysis of Late Proterozoic through Lower Cambrian rocks of the Death Valley regional ground-water system and surrounding areas, Nevada and California by Donald S. Sweetkind and Diane K. White on the Web only at: <http://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-01-0351>

**DOE/RW-0545** - Site characterization progress report, Yucca Mountain, Nevada: Nuclear Waste Policy Act (Section 113) - April 1, 2000 - September 30, 2000, Number 23 (August 2001)

You may place an order or check charges for shipping by calling (775) 784-6691 x2 or through our shopping cart at [www.nbmjg.unr.edu/sales.htm](http://www.nbmjg.unr.edu/sales.htm)

# GSN January 18, 2002 Membership Meeting

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**Date:** Friday, January 18, 2002  
**Time:** Social-6:00, Dinner-7:00, Meeting-8:00  
**Cost:** \$17.00 (dinner)  
**Reservations:** 775/323-3500; fax 323-3599 or e-mail:  
gsn@mines.unr.edu  
**Deadline:** Reserve by noon Wednesday, January 16

**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:** Steve Garwin, Newmont Mining Corporation  
See abstract below.

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## THE GEOLOGIC SETTING OF INTRUSION-RELATED HYDROTHERMAL SYSTEMS NEAR THE BATU HIJAU PORPHYRY COPPER-GOLD DEPOSIT, SUMBAWA, INDONESIA

Steve Garwin, Newmont Mining Corporation, Nevada Mine Geology and Exploration  
University of Western Australia, Centre for Global Metallogeny

The Batu Hijau deposit, 914 million tonnes at an average grade of 0.53% copper and 0.40 g/t gold, lies within a 12 by 6 km district that contains several mineralized centers. The oldest rocks exposed consist of an Early to Middle Miocene andesitic volcanoclastic succession. This sequence has been cut by several phases of intermediate to felsic intrusion, Middle Miocene to the mid-Pliocene in age, and a late, andesitic diatreme and dike complex. The volcanoclastic rocks and intrusions in the district, typically of low-K, calc-alkaline affinity, form part of the Sunda-Banda magmatic arc, which is underlain by oceanic crust near Sumbawa.

The margins of easterly-elongate quartz diorite plutons focussed brittle deformation, dike emplacement and quartz vein deposition throughout the Neogene to Holocene. The reactivation of pre-existing faults and zones of crustal weakness, and the intersection of fault and fracture zones with the complex margins of pre-mineralization composite plutons, are inferred to have localized emplacement of felsic intrusions associated with porphyry-style mineralization at Batu Hijau and three peripheral porphyry systems.

Hydrothermal alteration centered on the Batu Hijau deposit and peripheral porphyry systems, shows a progression of alteration from central biotite-magnetite±oligoclase, through proximal actinolite and distal epidote-chlorite, to background chlorite-calcite. Late, structurally controlled feldspar-destructive alteration that overprints all types of early alteration includes intermediate argillic, sericitic/paragonitic, illitic and advanced argillic types. The geometry and clay-mica mineral assemblages of these zones indicate higher temperatures and more acidic fluid conditions near Batu Hijau than indicated for late alteration zones elsewhere in the district.

At Batu Hijau, hypogene chalcocite, digenite, bornite and native gold compose part of early "A" veinlets and chalcopyrite±bornite occur in transitional "B" veins. Late pyritic "D" veins contain chalcopyrite±minor bornite. The peripheral porphyry systems lack the early copper-sulfide assemblages, and are characterized by late-stage pyrite-chalcopyrite in re-opened parts of early, copper-poor "A" and "B" veins. Elevated gold and silver values are associated with pyrite±sphalerite±galena±chalcopyrite ±tennantite-bearing, comb and banded quartz veins that occur in late, structurally controlled zones. The general patterns of metal zoning with respect to the porphyry centers indicate central Fe, Cu, and Au, proximal Mo, and distal Pb, Zn, Ag, Au and As anomalies. Silver/gold ratios also display a systematic decrease from >50 in the Pb-Zn halo to ~1 to 2 in the Cu-Au core of each center.

SHRIMP <sup>206</sup>Pb/<sup>238</sup>U geochronology indicates four major felsic intrusive episodes, each separated by 0.6 to 0.9 m.y. and related to a distinct porphyry center with ages that range from 5.9 to 3.7 Ma. The duration of the Batu Hijau hydrothermal system is 80 ± 80 k.y. (2σ), as determined from the <sup>40</sup>Ar/<sup>39</sup>Ar closure of early biotite and late sericite (3.73 ± 0.08 Ma vs. 3.65 ± 0.02 Ma). The causative tonalite intrusions at Batu Hijau were emplaced at a depth of ≤2 km (± 0.5 km), with formation of hornblende phenocrysts in magma chambers that reached at least 9 km below the mid-Pliocene paleosurface, as indicated by the results of amphibole-plagioclase thermobarometry.

The Batu Hijau deposit displays many of the characteristics of global porphyry copper systems. However, significant differences are related to the low-K, calc-alkaline composition of the tonalitic melts at Batu Hijau. The resultant magmatic-hydrothermal fluids are responsible for the K-poor alteration types that distinguish this deposit from others, particularly those porphyry systems associated with quartz monzonite in continental settings. At Batu Hijau, secondary oligoclase supplants K-feldspar in the central biotite-magnetite zone, and locally paragonite proxies for sericite.

## TOP 10 SIGNS YOU MIGHT BE A GEOLOGIST

1. You have ever responded, "yes" to the question, "What have you got in here, rocks?"
2. You have ever taken a 22-passenger van over "roads" that were intended only for cattle.
3. You have ever found yourself trying to explain to airport security that a rock hammer isn't really a weapon
4. Your rock garden is located inside your house
5. You have ever hung a picture using a Brunton as a level and your rock hammer as your hammer
6. Your collection of beer cans and bottles rivals the size of your rock collection
7. You consider a "Recent event" to be anything that has happened in the last 20,000 years
8. Your photos include people only for scale and you have more pictures of your rock hammer and lens cap than your family
9. You have ever been on a field trip that included scheduled stops at a gravel pit and/or a liquor store

And the #1 sign you might be a geologist...

10. You have ever uttered the phrase "Have you tried licking it?" with no sexual connotations involved

## BATTLE MOUNTAIN – ARMPIT OF AMERICA?

On Dec. 2 the Washington Post published an article written by Gene Weingarten in which he chronicled his search for the town most befitting the designation of "Armpit of America". He settled on Battle Mountain but in describing the town and residents, he also spoke of the particular spirit of the people there. It is well worth reading, particularly for the many GSN members who've spent much time in various Armpits across Nevada and way beyond.

The Washington Post ([www.washingtonpost.com](http://www.washingtonpost.com)) charges a fee to access archived articles (more than 2 weeks old), but this article is well worth the \$3 fee. We can't reprint it due to copyright issues. Lorrie Baumann, editor of the Battle Mountain Bugle, lost her job over the article – that's a pity.

During a discussion about this article, stories started being told about some of the places geologists have spent time; Beatty, Valmy, Goldfield, etc. Those stories narrate a history of the exploration industry and the spirit of the people who work in it. We oughta be writing these down cuz there might not be another generation that's gonna travel to these places and see the things you've all seen. So – write them down and send them to us at GSN. They don't have to be long – just a memory of a place or an event that most people will never see or experience. We might publish them. We'll compile them into a kind of living history before the stories disappear altogether.

## 2001–2002 MEMBERSHIP DIRECTORY

Gregory McN. French, GSN Membership Chairman

The 2001-2002 directory should be completed and shipped by the end of the month. A little delayed due to the flurry of last minute renewals and directory advertising. On behalf of the membership, I wish to thank all who advertised this year. Their support is vital in offsetting the costs associated with the preparation and printing of the directory.

## 2<sup>ND</sup> ANNUAL FOUNDATION ROCK RAFFLE AND CHRISTMAS MEETING



By the look on the winner's faces and the shouts of "Yeah" coming from the audience, I think it is safe to say that the GSN's 2<sup>nd</sup> Annual Foundation Rock Raffle and Christmas meeting was a huge success. From the cigar won by Rachel Dolbier to the 5 gram Round Mountain gold ore sample won by Jim Collord, everyone was happy

with whatever they were lucky enough to take home that night.

107 well-dressed members and their guests enjoyed prime rib and chicken cordon bleu, followed by Jeff Doebrich's fascinating talk and great slide show on Saudi Arabia. The highlight of the evening was the announcement of the numerous raffle prizewinners. We had over 60 prizes donated by generous individuals and corporations. The GSN would like to sincerely thank everyone who donated something to the cause. Thanks also to all of those who bought raffle tickets and bid on the two Round Mountain gold specimens. With your support, the GSN Foundation was able to make \$2,067 that night. It was nice to see so many people turn out for a fun and social evening. It goes to show you that no matter what hard times our members are having they are always supportive of GSN and each other.



Jim Collord winning the gold.

# ROCK RAFFLE WINNERS

(Donors listed in parenthesis)

2 gram Gold ore sample, Round Mountain Mine (Homestake/Echo Bay Mines) – Eric & Debbie Struhsacker (high bidders)  
8 gram Gold ore sample, Round Mountain Mine (Homestake/Echo Bay Mines) – Dennis Bryan (high bidder)  
5 gram Gold ore sample, Round Mountain Mine (Homestake/Echo Bay Mines) – Jim Collord (raffle winner)  
1999 Turley California Old Vines Zinfandel (Patrick Highsmith) – Gene Saucier  
Sleeping Bag (CGS Inc.) – Marty Dennis  
Chalcopyrite specimen (Miner's Lunch Bucket Minerals, Scott Werschky & Alan Day) – Al Coyner  
Pyrite crystals (Miner's Lunch Bucket Minerals, Scott Werschky & Alan Day) – Dave Greenan  
Carved calcite eagle (Miner's Lunch Bucket Minerals, Scott Werschky & Alan Day) – Paul Renken  
Cigar (Lane Griffin) – Rachel Dolbier  
Orthoceras "tree" (Stone Age Quarry) – Tom Nimsic  
Onyx chess set (Stone Age Quarry) – Jessica Muehlberg  
Halite lamp (Stone Age Quarry) – Tom Irwin  
Nevada rock shapes (Al Coyner) – Jim Collord, Neil Prenn, Al Kirkham  
Troy pound silver bar (Nevada Mining Association) – John Pierson  
Quartz on barite specimen (GeoPrime Minerals) – Neil Prenn  
Barite crystals, Meikle Mine (GeoPrime Minerals) – Shea Clark Smith  
Calcite crystals with 1 oz silver bar label, Santa Eulalia Mine (Global Hydrosearch, Mark Stock) – Marty Dennis  
Wulfenite, Silver Bill Mine, AZ (Neil Prenn) – Marty Dennis  
Quartz crystal cluster, Phillipsburg, MT (Neil Prenn) – Linda Shipp-Bonham  
Garnet and citrine cut stones (Cami Prenn) – Joe Kizis  
Hanksite crystals, Searles Lake, CA (D.D. LaPointe) – Tom Irwin  
Deep sea manganese nodule (Lew Gustafson) – Carol Callaghan  
Native copper, northern Michigan (Lew Gustafson) – Armando Valencia  
Modern stromatolite, Shark Bay, Western Australia (Lew Gustafson) – Carol Callaghan  
Colemanite crystals, Boraxo Pit, Death Valley (Tom Troutman) – Ann Carpenter  
Copper ore, Kennicott Mines, Alaska (Ed MacKevett) – Gary Fechko  
Nevada rock tie tack pins (Jon Price) – Rachel Dolbier, Clark Smith, Rich DeLong  
Sphalerite crystal specimen, Elmwood Mine, Tennessee (Keck Museum) – Dennis Bryan  
2 Rock eggs (Maureen Leshendock) – Carol Callaghan  
Dinosaur (Maureen Leshendock) – Diane Bryan  
Calcite crystal cluster (anonymous donor) – Marty Dennis  
Arsenopyrite – dipyramidal crystal specimen (anonymous donor) – Al Kirkham  
Jerritt Canyon commemorative goldplated silver round (AngloGold Mining Co.) – Paul Renken  
One ounce silver round (Nevada Mining Association) – Ticket #2116064  
Bottle of wine (Opal Adams & Rich DeLong) – Marty Dennis  
Handmade chocolates (Opal Adams & Rich DeLong) – Laura Ruud  
Box of golf balls (Ken Cunningham) – Al Coyner  
NMA Notebooks (Nevada Mining Association) – Rachel Dolbier, Mack Taylor  
Hat and sweatshirt (Newmont Mining Corporation) – Gary Fechko, Marty Dennis  
Newmont jacket (Newmont Mining Corporation) – Bill Johnson, Raye Buckley  
Galileo thermometer (Richard Vineyard, Nevada Dept of Education) – Bill Kohlmoos  
Nevada publications (Nevada Bureau of Mines & Geology) – Bill Klud  
GSN publications (GSN) – Rachele Boskie, Greg Ekins, Jim Collord  
Cake (Phyllis Brock, Nothing To It) – Pete Dilles  
Alaskan Outhouses Book (Eric Ruud) – Herb Duerr  
Cashman Equipment belt buckle (Al Coyner) – Gary Fechko  
Cortez Gold Mines belt buckle (Al Coyner) – Shea Clark Smith  
NWMA long sleeved T-Shirt (Al Coyner) – Carol Callaghan  
Weather Receiver (Maureen Leshendock) – Tom Irwin  
Mini microscope (Maureen Leshendock) – Ruth Buffa  
Dynamite T-Shirt (Lane Griffin) – Tom Temkin  
Powder Box End (Lane Griffin) – Bill Neumann





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*Happy New Year  
Everyone*

The GSN Staff

# UP-COMING EVENTS

**Jan 8, Tuesday** – Nevada Petroleum Society Meeting: Austin's Restaurant, Mt Rose Room, 7671 S Virginia, Reno, NV. Speaker: Mike Price, ESRI, Inc., Redlands, CA. Topic: GIS for Petroleum and Mineral Exploration and Production. Contact Marilyn Miller, 775/334-2772 x26.

**Jan 10, Thursday** – WINNEMUCCA CHAPTER MEETING: Humboldt Room at the Red Lion Hotel/Casino, Winnemucca, NV. Speaker: Greg Ferdock. Topic: Minerals of Nevada. Bar opens at 6:45 pm, meeting at 7 pm. Contact Sheila Bunch, sbunch@lambdacom.com, 775/623-0202.

**Jan 11** – Northern NV section of SME meeting. Noon at the Bonanza Casino, Reno, NV. For more information: www.smennv.org.

**Jan 17, Thursday** – ELKO CHAPTER MEETING: Western Folklife Center (NOTE CHANGE), Elko, NV. Speaker: Ted Theodore, USGS, Menlo Park, CA. Topic: Northern Carlin Trend Geochemistry. Refreshments at 6:30 pm. Contact Leslie Creel for information, 775/468-4400.

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**Jan 24, Thursday** – SOUTHERN NEVADA CHAPTER MEETING: Lily Fong Geoscience Building, Room 102, UNLV, Las Vegas, NV. Speaker: Nick Saines, Consulting Hydrogeologist, Las Vegas, NV. Title: "Lost Afghanistan". Social-5:30 pm. Contact Chris Riecken for information, 702/435-5664.

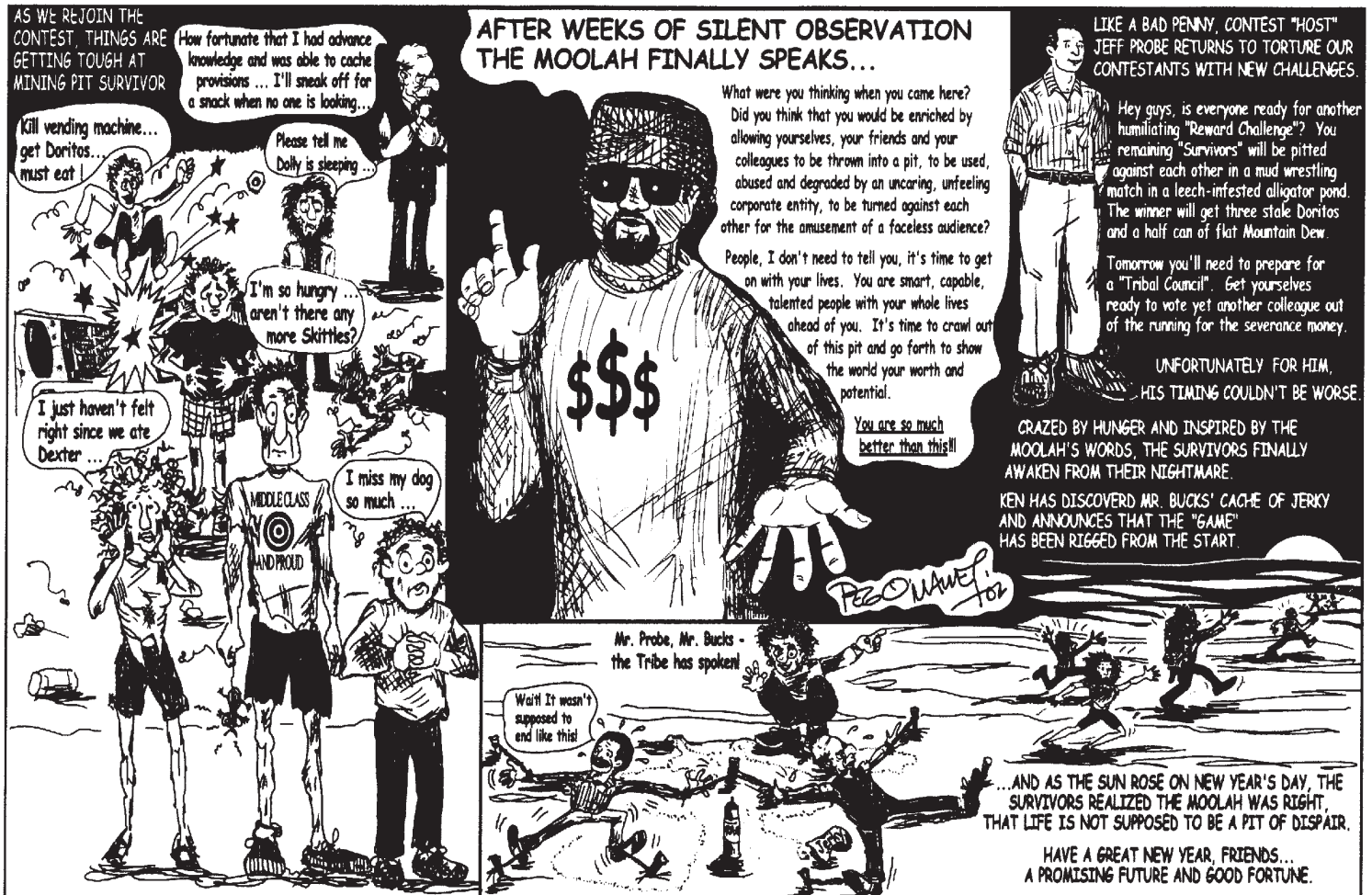
**Jan 22-25** – Cordilleran Roundup – Hotel Vancouver, Vancouver B.C. Contact B.C. and Yukon Chamber of Mines, 604/681-5328 or visit the website: www.chamberofmines.bc.ca.

**Feb 6, Wednesday** – WINNEMUCCA CHAPTER MEETING: Humboldt Room at the Red Lion Hotel/Casino, Winnemucca, NV. Speaker and topic to be announced. Bar opens at 6:45 pm, meeting at 7 pm. Contact Sheila Bunch for information, sbunch@lambdacom.com, 775/623-0202.

**Feb 25-27** – SME Annual Meeting, Phoenix, AZ. Contact SME 303/973-9550 or 800/763-3132.

**March 10-13** – PDAC Annual Convention, Toronto, Canada. 416/362-1969 or email: hsklarz@pdac.ca

**April 14-16** – SEG Annual Convention, Global Exploration 2002: Integrated Methods for Discovery; Denver, CO. For information go to: www.seg2002.org.



Dear Friends: With all the gloom and doom I've had a lot of trouble lately getting my head into a space where I can create anything that's even remotely funny. It's hard to make jokes and poke fun when so many of your friends are out of work and fearful of the future, and some nut case overseas is trying to end civilization as we know it. I'm putting the GSN cartoon on the backburner, just for awhile. I don't think I'm very funny these days and I want to give you my best, not just whatever I struggle to come up with in desperation. To draw something just to draw it isn't where I want to be going for you. You deserve more than that.

One of my favorite comedians, Harry Shearer, said that when the going got tough, the tough got timing. I'm hoping that by taking a little time off to regroup I can come back very soon with my sights locked on all our favorite targets.

**Have a great New Year, everyone. And here's wishing for good health, good friends, good fortune and better times for us all.**

# GEOLOGICAL SOCIETY OF NEVADA



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