

# **Bulletin of the Mineralogical Society of Southern California**

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**Volume 77 Number 2**

**February 2007**

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**The 828th Meeting of The Mineralogical Society  
of Southern California**

## **Adventures in Iceland and Greenland**

**by**

**Mary L. Johnson, Ph.D., and Mark Parisi**

**Friday, February 23, 2007, at 7:30 p.m.**

**Geology Department, E-Building, Room 220**

**Pasadena City College**

**1570 E. Colorado Blvd., Pasadena**

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### **Inside this bulletin:**

- February Meeting

- The Goodsprings District (part 2)
  - Minerals and Fossils on Display at Cal State Fullerton
  - Bubble Gum Agate
  - Some Information I Learned at the GIA Gemological Research Conference
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## About February Meeting.....

**Date:** Friday, February 23, 2007

**Speakers:** Mary L. Johnson, Ph.D., and Mark Parisi

**Topic:** Iceland and Greenland: Adventures amid Young and Old Rocks, and Cold and Hot Water

The authors met as undergraduates at Caltech, and took these photographs and samples last year while on a Caltech Alumni field trip to Iceland and Greenland. Come learn something about the geology, climate, and populations of two extreme northern islands.

Dr. Johnson is a longtime MSSC member and former President. Until recently the Manager of Research and Development at the Gemological Institute of America in Carlsbad, CA, she has degrees from Caltech and Harvard, and also held a postdoctoral position at UCLA. She is now owner of Mary Johnson Consulting, a natural history consulting firm.

Mr. Parisi graduated from Caltech in Electronic Engineering, and is currently Senior Director of Technology at Qualcomm in San Diego. Past positions include System Architect of the Deep Space Network at Caltech's Jet Propulsion Laboratory, and software engineer for

Intermetrics, in Cambridge, Massachusetts. His photography is rarely seen but highly admired, and has been on display in the Caltech Geology department.

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## Minutes of the January 20, 2007, Meeting

Due to time constraints, the January minutes will be printed in a later issue.

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### The Goodsprings District

#### Part II Ore Deposits

by Walt Margerum

## Ore Deposits

The descriptions of the deposits in italics have been extracted from Hewett.

### Gold

Only half a dozen deposits were mined primarily for gold. The main one being the Keystone that have a reported production of \$600,000. Others such as the Boss produced some gold along with its main product, copper.

### Copper

In several respects the copper deposits may be considered intermediate between the gold deposits and the zinc and lead deposits. Notable quantities of copper minerals are present in most of the gold deposits, and these minerals have been encountered sporadically in the zinc and lead deposits. Several of the larger bodies of copper minerals have been found near intrusive masses of granite porphyry (Columbia and Boss mines), but none have been found in such rocks. Several, however, are remote from known intrusive masses (Ninety-nine mine). The copper in these deposits is present largely in the form of malachite and azurite, but some chrysocolla is generally present, and two oxides are recorded, tenorite and cuprite. The evidence is quite clear that the original mineral was largely if not wholly chalcopyrite and that it was deposited with only small quantities of gangue minerals in breccia zones in dolomitized limestone. Some of the oxidized cobalt minerals are persistently associated with the copper minerals, and shipments of cobalt ore have been made from four mines.

### Zinc and Lead

*Zinc and lead minerals are persistently associated in most of the ore deposits of the district, but a few zinc deposits are entirely free of lead minerals, and a few lead deposits contain no zinc minerals. Except for the Yellow Pine and Prairie Flower ore bodies, which underlie the Yellow Pine granite porphyry sill, most of the zinc and lead deposits are remote from outcropping bodies of intrusive rock, and if it were not for the regional relations of all the metalliferous deposits and the association of the widespread dolomitization of limestone and certain structural features, it would be difficult to prove a genetic relation of the intrusive rocks to the zinc and lead deposits.*

*Unweathered zinc sulphide has been observed in only two mines in the district, but lead sulphide is rather widespread. The commonest zinc mineral is earthy hydrozincite (hydrous carbonate of zinc), most of which has been formed through the replacement of dolomite by zinc sulphate. Smithsonite, the anhydrous zinc carbonate, is found in some of the mines, where it has been deposited in open fractures and watercourses. Locally, it has been altered to hydrozincite. A little calamine (hydrous silicate of zinc) is found in most of the mines. Experimental work has shown that anhydrous zinc carbonate tends to form where there is abundant excess of carbonic acid, and hydrous zinc carbonate where there is a deficiency of*

*carbonic acid. The distribution of these two minerals in this district conforms with the conclusions of experimental work.*

*Although galena is widespread, probably most of the lead in the deposits is present as cerussite (lead carbonate); some anglesite (sulphate of lead) is found in most of the mines. The simple vanadate of lead, vanadinite, was recognized at only one mine, but small quantities of the mixed vanadates of lead, zinc, and copper are widespread.*

### **Structural relations of the ore deposits**

*The broad form of most of the deposits of the district, especially of the larger deposits, is distinctly tabular, although here and there some of the smaller bodies have simple or complex rounded forms. Most of these tabular forms lie nearly if not quite parallel to the bedding; a smaller number cut the bedding obliquely. The conclusion may be broadly stated that the deposits lie along fractures that have broken the beds, especially the massive beds of limestone. In several places the fractures that lie nearly parallel to the bedding have been interpreted as thrust faults which are slightly older than the fractures that cross the bedding. It seems here that the solutions bearing the sulphides of the metals have risen along the crosscutting fractures and spread out in the breccia zones along the earlier thrust faults. Probably this explanation applies to other deposits where the evidence is more obscure. The largest ore deposits have been found in the fractures and breccia zones that trend nearly parallel to the bedding. Two large ore deposits, those of the Potosi and Bonanza mines, lie in conical or domal breccia zones, where they are cut by later, nearly vertical fractures.*

*Many ore bodies in the district, especially in the southern part, are broken by minor postmineral faults, but the extent of these is not great.*

### **Genesis of the ores**

*In this district a thick section of limestone beds has been folded, broken by several major and numerous minor thrust faults, and then intruded by dikes and sills of a granular silicic igneous rock. After more minor thrust faulting and minor normal faulting, metalliferous sulphides and gold were deposited in breccia zones and fractures. In a broad way the gold deposits lie in fractures in or near the intrusive rock, the copper deposits are more remote from the intrusive bodies, and the zinc and lead deposits are most remote. Apart from a crude zonal distribution outward from the intrusive bodies, the presence of a little copper in both the gold deposits and the zinc and lead deposits tends to link them in a common origin. It is possible, though not certain, that a deeply buried mass of igneous rock was the actual source of the metals, and it seems probable that such a body caused the ascent and dispersal of the metals.*

### **Other Ores of Interest**

**Knopf describes an interesting and unusual occurrence of platinum group minerals found at the Boss mine. The platinum occurs with gold in association with a powdery bismuth rich plumbojarosite. It has been found only in a small area of the mine. The**

**platinum and gold are fine grained, and the gold is coated with an undefined black material that can be removed by abrasion. The ore found was rich, some samples averaging over \$6000 per ton, but was limited in extent. Hewett states that platinum was found at the Oro Amigo, and possibly at the Golden Chariot mines. 506 ounces of platinum and 762 ounces of palladium are reported as having been shipped by 1962.**

Cobalt in the form of the mineral heterogenite is found in many of the mines of the district. About 5 1/2 tons are reported as being shipped.

About 5 tons of vanadium were shipped, primarily from the Hoodoo, Fredrickson, and Spectrum mines.

Silver in the form of chlorargyrite has been found at the Crystal Pass prospect, and in the forms of proustite and tennantite at the Lavina.

The antimony mineral stibnite, along with its oxides, has been found at the Yellow Pine, Lavina, Boss mines along with a prospect near the Mountain Top mine.

Trace amounts of uranium minerals are found at many mines especially at the Green Monster mine.

### **References**

Albritton, Claude C. Jr., et al (1954) "Geologic Controls of Lead and Zinc Deposits in Goodsprings (Yellow Pine) District, Nevada"; United States Geological Survey Bulletin 1010, pp. 111

Hewett, D. F. (1931) "Geology and Ore Deposits of the Goodsprings Quadrangle, Nevada"; United States Geological Survey Professional Paper 162, pp. 172

Knopf, Adolph (1915) "A Gold-Platinum-Palladium Lode in Southern Nevada"; United States Geological Survey Bulletin 620-A, pp. 18

Longwell, C. R. et al (1965) "Geology and Mineral Deposits of Clark County, Nevada"; Nevada Bureau of Mines Bulletin 62, pp. 218

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### **MSSC Bulletin goes color!**

As a member, I often hoped to see the black and white pictures in the printed Bulletin to appear in color. So my first order of business after assuming the role of editor was to look into bringing some color to our monthly newsletter. However, since most members prefer to get their Bulletins by mail, printing costs are a concern. This issue is an experiment.

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### **Don't Miss the Minerals and Fossils on Display at Cal State Fullerton**

*by Janet Gordon*



In 2005 the CSUF Department of Geological Sciences received the Mack McGraw collection of minerals and fossils. The collection consists mainly of minerals specimens plus polished slabs and some fossils. As a longshoreman on the docks of Long Beach, McGraw built his collection in a variety of ways, including buying and trading, and convincing ship captains and truck drivers to bring him precious minerals from all over the world.

The collection is presently on display as part of “Geo-Garden, an Exhibition of Minerals and Fossils” in the University’s Atrium Gallery where it will remain until March 18, 2007. In addition to the minerals, Miocene fossils from Orange County are on display outside the main gallery. The fossils have been recovered from construction sites and show what creatures were roaming Orange County 23.8 to 5.3 million years ago.



The Atrium Gallery is located between the North and South Buildings at Pollak Library and is open M-Th. 9 a.m.-7 p.m., Fri. 9 a.m.- 5 p.m., Sat.-Sun. 12-5 p.m. For more information call 714-278-7160. Specimens on display include the aragonite, tourmaline, and smoky quartz pictured below.



Photos courtesy of CSUF newsphotos.

## Show and Tell: Bubble Gum Agate

Story and photo by Shou-Lin Lee

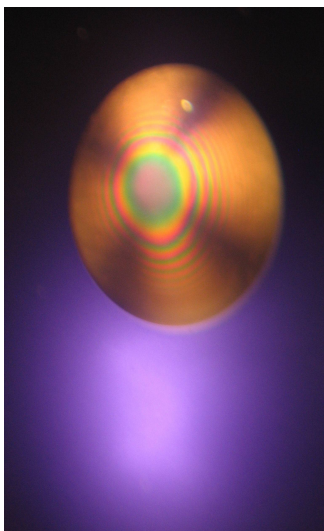
**Subject:** tumbled agate nodules found in the Kadoka grassland in South Dakota .



**Quartzsite, Arizona:** The sign said “Bubble Gum Agate.” If the vendor wanted to catch customers’ attention, it did the trick for me. I was staring at a tray of mixed-color worn out rocks. The sizes of the rocks vary from a half inch to about two inches in diameter. The colors ranged from off-white, light pink, coral pink, yellow, orange to black. Some looked unremarkable and some reminded me of decayed teeth like the one in the middle of the picture with black dots. My lapidary instinct told me that this is not something I should spend my money on.

But, they do look like chewed up bubble gum, as the sign said. I started rummaging through the tray. As my hands got fuller, I also caught the attention of the vendor, so to make some small talk, I asked the obvious: “Why do you call them bubble gum agates?” “Because they look like chewed up bubble gum,” was the answer. The vendor (sorry I did not ask his name) told me that he collected the nodules at various places in South Dakota. Those shown in the picture are tumbled by nature. He tried to improve the surface by tumbling some in a rotary tumbler. Unfortunately the shine took away the natural charms. I looked at the shiny rocks in his hand and agreed that nature did a better job than the machine and bought all the ones that looked most like bubble gum. Who knows, maybe one day I can put out a display of rocks that look like disgusting food items.

## About Show and Tell



Part of the fun of collecting is being able to show and tell. In this new section called **Show and Tell**, I hope to generate some dialogue among all members, especially those who are unable to attend the monthly meetings.

Any member who is interested in showing the world his or her collection, new find, geological formation or an interesting picture like the one at the left (I will let you know what it is in the next issue) should e-mail me one or more photos (yes, I need photos!) and a brief description or narrative about the photo(s). If writing is too big a hassle, please just answer the following questions and I will do the rest. The questions are: 1) what is it? 2) where and how did you acquire it? 3) what is special about the item? Please limit the subject matter to geology, mineralogy and related subject

matters.

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Open 10 to 6 Daily (except Sat., Feb. 10<sup>th</sup> only, 10 to 5)

## **ARIZONA MINERAL & FOSSIL SHOW**

### **5 Easy to Find LOCATIONS**

- **QUALITY INN - Benson Hwy.** - Interstate 10 at Exit 262
- **Clarion Hotel - Randolph Park** - 102 N. Alvernon, at Broadway
- **InnSuites Hotel - Downtown** - 475 N. Granada Ave., at St. Marys
- **Ramada Ltd. - Downtown** - 665 N. Freeway, at St. Marys
- **Mineral & Fossil Marketplace** - 1333 N. Oracle, at Drachman

Martin Zinn Expositions, L.L.C., P.O. Box 665, Bernalillo, NM 87004

Fax: (505) 867-0073, email: [mz0955@aol.com](mailto:mz0955@aol.com), [www.mzexpos.com](http://www.mzexpos.com)

## **Some Information I Learned at the GIA**

### **Gemological Research Conference**

The first GIA Gemological Research Conference was held on August 26-27, 2006 at San Diego. It was an eye opening experience for me to listen to topics from the down-to- earth kind, like jadeite mining in Myanmar and new gem finds to extremely technical descriptions of how to detect high tech treatments in corundum and diamonds. There were more than one hundred presentations, the following are only some of which caught my attention:

With the production explosion of Chinese cultural freshwater pearls, it was surprising for me to find out that for centuries, freshwater pearls were produced in Europe too. But European freshwater pearls are not commercially available because unlike Chinese freshwater pearls which grow in a very fast rate, the European pearls grow very slowly. To make matter worse, the European pearl producing mussel: *Margaritifera margaritifera* is on the endangered species list.

Can you guess that if you gathered together all the fashioned diamonds ever been mined since the beginning of mankind how big a pile would it be? The size of an Egyptian pyramid? The size of a football field? The answer is the size of a double-decker bus.



When speaking of demantoid, people often associate it with Russia. In October 2001, demantoid was found in Iran. Some samples contain the “horsetail” inclusions similar to those found in Russian demantoid.

A study on how to separate gems using a powerful neodymium-iron-boron (NdFeB) magnet got my full attention. The researcher, Ms Gumpesberger, demonstrated how to use NdFeB magnets to separate gems which contain essential Fe and/or Mn from those which do not contain Fe or Mn. For instance, an Almandine attracts to the NdFeB magnet while a red spinel or a pyrope will not move. This magnet method really appealed to me, because three times the “red spinels” I bought turned out to be garnet, and I found this out only after I took them home and did a refractive index reading,. The method cannot confirm whether a red gem is a spinel or a pyrope, but at least if it reacts to the magnet it is definitely not spinel. By the way, the NdFeB magnets can be purchased at the PCC monthly Sunday swapmeet.

by Shou-Lin Lee

## 2007 Calendar of Events

January 27-February 10, Tucson, Arizona Mineral and Fossil Show, Five locations: Quality Inn-Benson Hwy, Clairon Hotel, InnSuites Hotel, Ramada Ltd, Mineral & Fossil Marketplace, Details at [www.mzexpos.com](http://www.mzexpos.com).

February 8-11, Tucson, Arizona, Tucson Gem and Mineral Show: “Australia-Minerals from Down Under,” Tucson Convention Center, [www.tgms.org](http://www.tgms.org).

February 16-25, Indio, San Geronio Mineral & Gem Society, Riverside Co. Fair & National Date Festival/Gem & Mineral Building #1, 46-350 Arabia St., Hours: 10 a.m.010 p.m., Bert Grisham (951) 849-1674.

February 24 - 25, 2007, Antioch, Antioch Lapidary Club Contra Costa County Fairgrounds Flower Building at West 10th & L t's Hours: 10 - 5 both days Ellen Bauer (925) 458-2539 Website: [antiochlapidary.tripod.com](http://antiochlapidary.tripod.com)

March 2-4, Hayward, Mineral & Gem Society of Castro Valley, Centennial Hall at 22292 Foothill Blvd., Hours: Fri. & Sat. 10-8, Sun. 10-5, Larry Ham (510) 887-9007, [info@mgscv.org](mailto:info@mgscv.org).

March 2-11 2007, Imperial, Imperial Valley Gem & Mineral Society "60th Annual Gem & Mineral Show" California Mid-Winter Fairgrounds Hours: Fri, Sat, Sun. Noon - 10 p.m. Mon. Thru Fri. 4 - 10 p.m.

March 3-4, Arcadia, Monrovia Rockhounds, Los Angeles County Arboretum & Botanical Garden, 301 N. Baldwin Ave., Hours: 9-4:30 both days, [www.morocks.com](http://www.morocks.com).

March 3-4, Ventura, Ventura Gem & Mineral Society

The Ventura Gem, Minerals, Lapidary, & Fossils show. Seaside Park- Ventura County Fairgrounds, 10 W. Harbor Blvd. Hours: Sat. 10 - 5; Sun. 10 - 4.

