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The 865th Meeting of The Mineralogical Society of Southern California

Sapphires of Montana

By

Dick Flaharty

Friday, May 14, 2010 at 7:30 p.m.

Geology Department, E-Building, Room 220

Pasadena City College

1570 E. Colorado Blvd., Pasadena

Featuring:

--April program brief

--MSSC 2010 Membership list

--The 8th John Sinkankas Gem Feldpars Symposium

May 14 Program

Mr. Flaharty has been rockhounding in the northwestern states of Montana, Idaho, Oregon, Washington and Wyoming since the mid 1970s, and has developed a library

of slide programs on his exploits in the field. His program, "Sapphires of Montana" concentrates on his several visits to the sapphire mines along the Missouri River near Helena, Montana, and another mine west of Anaconda, Montana. The slides picture the various pieces of equipment and techniques used to extract the sapphires from the river gravels. The program begins with several rockhounding and fishing stops on the way through Idaho, including the remote Copper Basin area east of Sun Valley, and a run up along the Salmon River. There are also a few shots of displays at the American Federation of Mineralogical Societies Show held in Spokane, Washington one year. Mr. Flaharty will have a small display of sample materials he collected on these trips.

Dick Flaharty began collecting at the age of 10. He moved to California in 1966 and has been active in several mineral clubs. He has taught lapidary for 12 years in Jackson Hole, Wyoming as well as at ZZYZX (CFMS workshop). He particularly enjoys collecting sapphires in Montana.

April Program Brief

By Bruce Carter

The April program was "Diamond Occurrences in North America" by Walter Lombardo. Walt began by describing the origin and host rocks in which diamonds occur. He then focused specifically on diamond occurrences in North America where there has been increasing production over the pasts 10-20 years.

Diamonds originate in the Earth's aesthenosphere at a depth of 150 km or more. They all appear to be 2.4-3.2 billion years in age. They originate in peridotite or eclogite and are emplaced into the near-surface crust in explosively erupted kimberlite or lamprolite pipes. Lamprolites are ultrapotassic volcanic rocks concisting mainly of forsteritic olivined, phlogopite, diopside, richterite, leucite and sanidine. Kimberlites are potassic volcanic rocks that commonly include xenoliths of peridotite mantle rocks and sometimes diamonds.



Look like a pile of ice cubes but these are high quality gem diamonds from Diavik. Photo courtesy of the Diavik Diamond mine.

He mentioned the Argyle mine in Australia that currently produces about 25% of the world's diamonds (many of them brown or "chocolate"). Canadian diamonds were discovered above the Arctic Circle in 1991 and several mines now have significant production, including the Ekati (6.5 million carats in 2007) and the Diarek (10 million carats per year). Major mines such as these may take up to 20 years to develop and currently are open pits but plan to continue as underground mines in the future. They typically run 0.4 to 3.2 carats per ton of host rock.

United States diamonds have mostly been found in alluvial gold deposits in the Southeast and West, and in glacial deposits in the upper Midwest. The Arkansas Crater of Diamonds State Park accounts for several diamonds each month. In 1872, diamonds (as well as faceted rubies and emeralds) were found in abundance (even in trees) and showed that investors and financial operators can be quite gullible (as reconfirmed by more recent events).

More than 600 diamonds have been found in California in alluvial deposits, mostly in the western Sierra Nevada (many near the town of Volcano) and the Klamath Mountains. A few complex, heavily overgrown diamonds up to 32 carats in size found in subduction complex rocks of Trinity County are very hard to explain.



The remote Diavik Diamond Mine is located 300 kilometres northeast of Yellowknife, capital of Canada's Northwest Territories, 210 kilometres to the north is the Arctic Circle. Photo courtesy of the Diavik Diamond mine.

List of 2010 MSSC Membership

Below is the list of 2010 MSSC membership. Please check for your name. If your name is not in the list this will be the last bulletin you will received. If you believe that your name should be included, please contact the

Membership Chair, Herman Ruvalcaba by phone at (562) 944-4855 or by email or by mail at 14728 Nanry St., Whittier, CA 90604-1850. A copy of membership form is included as the center insert.

Ruben Acosta	Gary Alford
Roger Barnett	Hal & Carole Beesley
Carl R. Biggs	Norman Bradley
Garth & Janice Bricker	Toni Callaway
Geoffrey & Patricia Caplette	Bruce Carter
Marek & Bozena Chorazewicz	John Clinkenbeard
Robert & Bonnie Commins	Rock Currier
Anne Davila	Fred & Linda Elsnau
Dorothy Ettenshon	Dr. Peter H. Farquhar
Al Gillette, Jr.	Janet and Paul Gordon
Catherine Govaller	Wesley Greenamyre
Jim Grothuesmann	Dale Harwood
Robert Housley	William Hudson
James Imai & Leslie Ogg	Robert W. Jones
Dr. Anthony Kampf	Ed Kiessling
Steve Knox	Shou-Lin Lee & Chris Fromm
Wayne & Dona Leicht	James & Laura Lloyd
Paul H. Malone	Daniel J. McHugh
Ann Meister	Elizabeth Moller
John Moore	Siegfried Muessig
Douglas Neves	Robert E. Pedersen
Wendy Rader	Louis & Carol Rector
Eugene A. Reynolds	Robert Reynolds

Kay Robertson	Jennifer Rohl
George Rossman	William Rowland
Herman Ruvalcaba	Carolyn Seitz
Christopher Sibel	Joseph Siefke
Ronald Sleeper	Richard Stamberg
Julia Steele	Ronald S. Thacker
Helen Vore	Wendell Wilson
Dr. Michael Wise	Dr. William Wise
Martin & Rose Zinn	

The Eighth Annual Sinkankas Symposium

By Shou-Lin Lee

Since I started attending the annual Sinkankas Symposium several years ago, every year I looked forward to the day. This year I was particularly excited, partly because the featured gem, feldspar, is one of the gem materials that I am very fond of cutting, and partly because an article I wrote on cutting gem feldspars would be included in the sixty-some page booklet to be handed out in the Symposium, and the finished stones that were featured in the article would be part of the display during the Symposium.

So after many days of staring at my computer screen trying to rein in my wildly running thoughts (which run in all directions) into a coherent and concise article, trying to figure out how to make my camera record the images of the stones exactly the way I saw them, and fighting with the stones that refused to be polished, the long anticipated April 17th finally arrived. As before, the symposium was held at the headquarters of Gemological Institute of America (GIA) at Carlsbad, California. Despite the heavily overcast weather and loss of sleep due to the uncomfortable motel bed, I arrived at GIA an hour early with bright eyes. After checking in, I first checked the booklet for my article. My article, entitled "In Search of Sun, Moon and Rainbow-A Lapidary's Notes on Cutting Feldspar" was on pages 17 through 23. The editor did a good job in arranging the photos. The pictures turned out better than I had expected. I patted my trusty camera.

Several display cases were already full. Mr. Bill Larson's display had many high quality blue sheen moonstones from India, Burma, and Sri Lanka. I spotted a green translucent cabochon next to a rough with similar color and was wondering why a jadeite was on display. Then I saw the label read "amazonite." I know some green amazonite has been passed off as jadeite, but I did not

know that it can be so translucent with such a pure, even green color, and no white banding that is characteristic in many amazonite. My shopping list just got one more item added.

The program started at nine o'clock promptly. There were ten speakers and all had impressive resumes. The speakers were as follows:

- Bob Weldon was Senior Writer and Director of Photograph at *Professional Jeweler Magazine* and currently on the staff of GIA.
- Dr. Simmons is the Director of the MP2 Research Group at the University of New Orleans.
- Si and Ann Frazier are writers for both rockhound magazines and professional publications.
- Lisbet Thoresen is volume editor and a contributing author of a forthcoming pioneering reference book, *On Gemstones: Gemological and Analytical Studies of Ancient Intaglios and Cameos*.
- Meg Berry is a professional faceter and gem carver.
- Rock Currier is the owner of a gem and mineral wholesale business, Jewel Tunnel Imports.
- Bill Larson is the President of Pala International.
- John Koivula is the Chief Gemmologist of GIA.
- George Rossman is a professor of Mineralogy at California Institute of Technology.
- Shane McClure is the director of West Coast Identification Services, GIA Laboratory.

Mr. Weldon started the program by introducing "The Many Faces of Feldspar." His presentation included pictures of different kinds of feldspar from the most abundant and no monetary value kind, such as gravel under our feet, to feldspar used as kitchen counter tops, to those that we are more familiar with, such as sunstone, moonstone, labradorite, sanidine and amazonite, to a necklace which set with a suit of blue sheen moonstones and diamonds which sold for almost half a million.

Dr. Simmons gave the audience a crash course on the chemical compositions and crystallography of different species of feldspar. Just like his presentation in previous years, Dr. Simmons' explanations on the molecular structures of feldspar made a serious subject quite entertaining.

Mr. Frazier often had stories to tell on gems, be it jade, or garnet or feldspar. This time he told us how spectrolite was discovered and how his fascination of spectrolite led him to visit the one and only place where spectrolite was mined, Ylaaml, Finland.

Lisbet Thoresen's "Archaeogemology of Amazonite" gave me a new perspective on amazonite. Of all the gem feldspars, amazonite attracted me the least, mainly because it does not have much mystery as far as cutting it concerned. According to Ms. Thoresen, gem feldspars were known in ancient times, but not commonly used. Amazonite is one of the oldest carved gem materials found in ancient burials. Amazonite beads had been found in Neolithic populations in North Africa, in Old Babylonia of Mesopotamia, and the Indus Valley Civilization of South Asia. Amazonite was coveted by the ancient Egyptians, especially during the 12th and 18th dynasties. Ms. Thoresen mapped out the archaeological sites where amazonite pieces were discovered, the sites of ancient

amazonite mines and modern amazonite mines. However, because there were no data available to distinguish amazonite from different localities, Ms. Thoresen's research could not positively identify the mine where the amazonite found in the burial site originated. Apparently, no research had been done on distinct characteristics of amazonite from each localities.

Meg Berry presented her "Tricks to Cutting Gem Feldspar." Her presentation was a pictorial journal, step by step of several faceted feldspars from start to finish.

Rock Currier presented his slides show on "Amazonite Specimen Production in Colorado and Ethiopia." In the 80's Mr. Currier did some amazonite mining in Colorado with heavy machinery under snow and hail conditions. In a more recent times, Mr. Currier went to Ethiopia to purchase amazonite specimens that were already mined by the locals. The presentation also include Mr. Currier's observation of the Ethiopian country side.

Bill Larson presented a collection of "World Class Collectible Gem Feldspars." His presentation included some rainbow moonstones that could rival the best jelly opals, and some golden moonstones that I only heard about, but had never seen.

John Koivula's presentation of "The Microworld of Gem Feldspars" gave us an intimate view of what's inside feldspars. According to Mr. Koivula, many minerals can be found in feldspar as inclusions, but feldspar is rarely an inclusion in other minerals. Mr. Koivula had found amphibole, apatite, hematite, pyroxene, olivine, copper platelets, epigenetic iron, phlogopite, pyrrhotite, ruby and gas bubbles as inclusions in feldspar. The gas bubble is a particularly interesting one, because the same gas bubble, if found in ruby, would be conclusive evidence that the ruby is a synthetic.

Before Dr. Rossman started his presentation on "Colors in Feldspars," Roger Merk, the organizer of the symposium, informed the audience that a two part presentation on the controversy of Chinese andesine by Dr. Rossman and Shane McClure would be followed by "Colors in Feldspars." Mr. Merk asked everyone to save their questions regarding red andesine for after that part of presentation. (For those who are not familiar with the controversy surrounding Chinese red andesine, please refer to MSSC Bulletin January 2009, March 2009 and April 2009 issues.)

Dr. Rossman started by saying that feldspar as a mineral does not have colors. The various colors seen in different kinds of feldspar are caused either by trace elements, or interference by the laminate structure within the crystal. He then explained his methodology in determining how amazonite get its blue. Amazonite is a potash feldspar. The radiation from potassium interacts with the presence of both water and lead in amazonite creates Pb^{3+} . Pb^{3+} is the cause of the blue color. The radiation from potassium also explained why quartz found within amazonite clusters is often smoky quartz, because the color of smoky quartz is caused by irradiation.

Shane McClure presented "Gemological Distinction of Treated and Natural Plagioclase Feldspar." Mr. McClure talked about how the introduction of so-called "Chinese red andesine" in the market since 2002 stirred up a whole array of studies of feldspar in particular plagioclase and andesine. Mr. McClure stated that using sophisticated scientific instruments in the laboratory, they were able to distinguish the treated materials from the natural ones due to the higher copper content in the treated material. However, the instruments were expensive and not readily available to most gemologists. The goal of his study was to find the gemological features that would enable

gemologists to separate treated red plagioclase from the nature red plagioclase definitively, using the standard gemological instruments such as refractometer, dichroscope, polariscope, spectroscope, and microscope. Many people offered their opinions as to how to distinguish the two, such as the pattern of the color zoning, the distribution of red and green, just to name a few. For each opinion, Mr. McClure presented pictures of both naturals and treated samples from each locality and disputed their credibility. In the end, the visible difference between natural and treated are the size of the copper flakes. The natural one, have larger copper flakes. But this conclusion is only valid until someone figures out how to make copper flakes bigger in the treated red andesine. And for those who thought that all red sunstones from Oregon are natural, Mr. McClure showed a picture of treated red sunstone from Oregon. So buyer beware, if the origin of color matters to you don't let your guard down.

Dr. Rossman's "The Great Red Feldspar Controversy" dispelled some of the rumors circulated in the web. Rumor had it that the so-called Chinese red andesine were really Mexican stones sent to China for diffusion treatment and resold in the US as Chinese feldspar. According to Dr. Rossman's electron microprobe analyses, the feldspars from Mexico, Oregon, and China had different chemical compositions and are considered three different species. However, feldspars from China, Tibet, Mongolia and Congo cannot be distinguished by the range of major element composition. Although copper can be diffused into plagioclase feldspar, it is not definitive proof of treatment. Dr. Rossman determined that the Chinese red andesine was treated by comparing the ratio of argon isotopes, Ar-40/Ar-36, in the yellow rough versus the red variety. Dr. Rossman's analyses on the red feldspar roughs brought back by an expedition team that visited the Tibetan mine in late 2008 also determined that the roughs were treated too. This conclusion raised serious doubt as to the existence of red andesine mines in Tibet and in the Congo.

With that, the symposium came to a close. As for the feature gem in 2011, all participants were asked to vote for three choices.

For those who plan to go to the West Coast Gem, Mineral & Fossil Show this is a reminder. The show has changed the location. It is at the Building 7 and 9 Fairplex in Pomona. Admission is \$5 for adults. One free admission with \$9 paid parking. But don't let the price discourage you. The show will have 32 special exhibits, 100 dealers, guest speakers, and door prizes.

In 2010 "we are changing our spots"!



MAY 14 - 16 ~ POMONA, CA

**West Coast GEM, MINERAL
& FOSSIL SHOW**

Bldgs. 7 & 9 at the Fairplex in Pomona

- Just north of I-10 & east of 57, south of Arrow Hwy.
- Main parking lot on north side of White Ave., near McKinley Ave.
- Use Fairplex Dr. (exit 43) from I-10

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2010 Calendar of Events

April 30 - May 1-2, 2010, Bishop, CA Lone Pine Gem & Mineral Society Tri-County Fairgrounds (Robinson Bldg.) Corner of Sierra St. & Fair Drive Hours: Fri. 6-9, Sat. 9:40-4, Sun. 10-3 Francee Gaham (760) 876-4319

May 1-2 2010, Anaheim, CA Searchers Gem and Mineral Society Brookhurst Community Center 2271 West Crescent Ave. Hours: Sat. 10 - 5, Sun. 10-4:30 Marty Swiderski Email: Martin.Swiderski@jacobs.com Website: www.searchersrocks.org

May 8-9 2010, Reno, NV Reno Gem and Mineral Society Reno Livestock Events Center Exhibit Hall 1350 N. Wells Ave., Reno, NV Hours: Sat. 10 - 5, Sun. 10-4 Ann Johnson (775)544-4937 Website: renorockhounds.com

May 14, 15, & 16 2010, Anderson, CA Superior-Cal Gem and Mineral Society Shasta Fairgrounds 1890 Briggs St. Hours: Fri. 10-5; Sat. 9 - 5; Sun. 10-4 Bob Davis (530) 824-6214

May 15-undetermined, San Diego, CA All That Glitters: The Splendor and Science of Gems and Minerals at San Diego Natural History Museum 1788 El Prado, Balboa Park. Hours: daily 10-5. Admission \$16 for adult.

May 15-16 2010, Yucaipa, CA Yucaipa Valley Gem & Mineral Society Yucaipa Community Center 34900 Oak Glen Road Hours: Sat. 9-5, Sun. 10-4 Bill Jochimsen (909) 790-1475 Website: www.yvgms.org

June 18, 19, & 20, Whittier, Combined AFMS/CFMS Show, Hidden Treasures Southern California University of Health Sciences 16200 E. Amber Valley Dr. Hosted by the North Orange Co. Gem & Mineral Society

