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THE 740th MEETING,  
of  
THE MINERALOGICAL SOCIETY  
OF SOUTHERN CALIFORNIA

Friday, September 9, 1999, 7:00 p.m.  
Geology Building, E Lecture Hall

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**SEPTEMBER PROGRAM**

David Perunko, Southern California Paleontological Society will discuss the geology, stratigraphy and paleontology of the Hell Creek Formation from Montana, North Dakota and South Dakota. Some of the megafloora and fauna from the Horner quarry will be on display, including a Triceratops femur and scapula, specimens of *Metasequoia* sp. and *Sequoia* sp., and other vertebrate material.

**PRESIDENT'S COLUMN**

by Bob Housley

Our annual August potluck picnic and swap meet this year was outstanding. It was certainly the best that I remember. We owe Pasadena City College and Carolyn Seitz a big vote of thanks for providing excellent facilities and fine organization and planning. In addition to our usual access to the lecture hall, kitchen, and museum two large laboratory class rooms complete with tables and chairs already set up were ready for us. One of these rooms was used for the swap meet, the other for the picnic lunch.

The talks were also fantastic. In the morning Casey and Jane Jones gave slide presentations first on Casey's work at the Flambeau Mine and then on their current joint work at the Mickle and Murry Mines in Nevada. The crystal caves at the Mickle Mine, lined with large green calcite crystals at higher levels and then also with golden barite at lower levels, are almost unbelievable. So are the world class stibnite crystals and related minerals that they have recently started getting at the Murry Mine.

In the afternoon Ron Pellar gave a very enlightening demonstration talk on displaying minerals. It certainly opened my eyes on a lot of points and I have been looking at mineral displays for quite a few years. Those who did not make it to the picnic this year should definitely try to next year.

Now I want to make a brief interim report on an experiment we began at the first of the year. That is having our own MSSC e-mail address. Carolyn Seitz set it up on mindspring and initially receives the messages, which she either answers herself or forwards to other people in MSSC that she thinks might be more appropriate or willing to deal with them. Quite a few come to me. So far the results are very reassuring. We are not overwhelmed by mail and most of the inquiries are interesting and worthwhile. We have gotten at least a couple of new members this way.

Several people have wanted collecting information that I was happy to supply. In return we now have contacts for information in their areas. Three were obviously serious collectors that I arranged to go out with. The trip with Tom Munson from Utah fell through because of a change in his plans, but I did take Greg Bye

from Eastern Washington to the Felix Mine, and he in turn gave me some nice zeolite material from Oxbow Dam. More recently I took Timothy Huang, a museum curator from Taiwan, and several friends on trip through the Santa Monica Mountains and they collected at least 50 pounds of fossils and some gyrolite nodules to take back to the museum. They were very happy with the trip and grateful to MSSC. They plan to come back again this winter.

All in all I would say that the experience so far with our e-mail address is very positive. I do feel a little guilty though about monopolizing the fun so if anyone else wants to participate they should contact Carolyn or I.

Following up on plans made during the Field Collectors Forum at our picnic Peter Weigand, Mike Evans, and I went out to the construction site on Kanan Road on the following Sunday and had a very good day. We all found clinoptilolite, stalactic and angel wing chalcedony, vein agate, botryoidal chalcedony with and without quartz crystals, and agate nodules. During the afternoon one of the construction workers, who was there picking up some decorative rocks for his yard even moved some big rocks around for us with his front end loader. I am sure Mike went home with at least 100 pounds of good agate nodules and botryoidal chalcedony. We plan to go back again on Sunday the 29th, and depending on how fast the grading is going probably again later.

This area also is of special interest to the serious collector of microminerals. It is the type locality for ferrierite-K, which was first described from here in a paper by Bill Wise and Mike Kokinos that appeared in American Mineralogist in about 1976. On the above trip I found 4 small specimens. Earlier on in the grading process they went through an area that was full of ferrierite and I collected several hundred. They are now drilling to blast near that area and I expect more fine ferrierite will turn up.

### **MINUTES OF THE 739th MEETING OF THE MSSC**

The 739th meeting of the Mineralogical Society of Southern California was called to order by President Bob Housley on August 14, 1999 at 11:00 a.m. in the Lecture Hall, Geology Building, Pasadena City College. Bob announced that the business meeting would be short since a full day was planned including the annual picnic, mineral swap, field collector's forum and talks by Casey and Jane Jones and Ron Pellar. A motion was introduced by Jim Schlegel that the prior minutes be approved as published in the Bulletin. The motion was seconded by Charlie Freed and carried by unanimous vote. Jim Schlegel discussed the need for additional volunteers for our upcoming show in November. Bob then called on Casey and Jane Jones who spoke on their collecting activities at the

Flambeau Mine and the Barrick Meikle Mine.

The meeting was adjourned at 12:20 p.m.

Respectfully submitted on behalf of the Secretary,

Ron Thacker, Bulletin Editor

### **THE DANA'S AND THEIR SYSTEM**

By John Schwarze

Most of us have heard the term "Dana System." We all nod knowingly and a few of us expound a little by using terms like molybdate, or carbonate. Well, in searching for ideas to fill these pages, I

asked a few persons (names not used to protect the innocent) and discovered that, at least among the newer members of the Society, there is at best an imperfect understanding of what the term means and what the "system" is. Yet anyone that has taken the time to organize their collection rather than keep it in tool boxes in the garage or on the seats of their breakfast nook (you know who you are) have probably used some version of the system. So you are all now subjected to these thoughts.

James and Edward Dana were a father and son team of professors at Yale University. In 1837, James proposed a mineral classification system that used multiple Latin names for minerals; just like roses or weasels. Thank goodness someone, maybe his son, told him how stupid that was and he rethought the whole thing. As a result, in 1868, James proposed a new system based on chemical composition that encompassed within specific classes minerals that had similarly arranged combinations of elements in their composition. Subdivisions of the system are based on crystal system and structure. The system starts off with the simplest chemical composition and progresses in complexity. James and Edward never really dealt with the Silicates, and neither did their appointed and anointed successors. As a result there have been a myriad of "refinements" and "new" systems introduced; but skin deep they're all the Dana System in disguise. Most of us are somewhat familiar with the modifications developed in the various editions of Dana's Manual of Mineralogy used as textbooks in collegiate mineralogy courses. The minerals are arranged as follows:

**Elements:** This class is composed of minerals made up of one element. Best examples are of course gold (Au), silver (Ag), diamond (C), sulfur (S), and graphite (C). There aren't too many minerals that occupy this class. I think that only about 20 to 25 can be found in a natural state, and some of those are most common in meteorites.

**Sulfides:** These minerals are composed of a metal and sulfur; examples: galena (Lead sulfide: PbS), pyrite (iron sulfide: FeS), and chalcopyrite (copper sulfide: CuS). Just to confuse you, many texts lump the **antimonides**, **arsenides**, **selenides**, and **tellurides** in this class. These follow the same general formula as the sulfides; but substitute antimony, arsenic, selenide, and telluride for sulfur, thus giving us breithauptite (NiSb), niccolite (NiAs), freibergite (CoSe), and calaverite (AuTe<sub>2</sub>).

**Sulfosalts:** This class is sort of a combination of Sulfides and the aforementioned antimonides, et al. So we end up with minerals such as proustite (Ag<sub>3</sub>AsS<sub>3</sub>) that combines a metal (silver), a semi metal (arsenic), and sulfur; giving us silver arsenide sulfide. This is another small class with only a little over 100 representatives, but they can be quite spectacular.

**Oxides:** A large class, composed of almost any element you can think of combined with oxygen. Since oxygen is second only to nitrogen in abundance, the possibilities are endless. Perhaps the most common example is ice (H<sub>2</sub>O at 320 Fahrenheit). However, quartz, with a chemical formula of SiO<sub>2</sub>, is not considered an oxide. Why? Because its crystal structure is so unique that it is used as the "parent" of all the silicates. I own, however, a mineral guide that insists that quartz is an oxide while going on to classify other minerals containing silica as silicates.

**Halides:** Another relatively small class of minerals, but of enormous economic importance. The most common examples are halite, or common salt (NaCl) and fluorite (CaF<sub>2</sub>); but the class includes other minerals vitally important in processing ores or containing ores. The class includes all minerals that are dominated by chlorine (Cl), fluorine (F), iodine (I), or bromine (Br).

**Carbonates:** This class of minerals may create more mineral collectors than any other. Who can pass up a good specimen of malachite (Cu<sub>2</sub>CO<sub>3</sub>(OH)<sub>2</sub>), azurite (Cu<sub>3</sub>(CO<sub>3</sub>)<sub>2</sub>(OH)<sub>2</sub>), calcite (CaCO<sub>3</sub>), or fail to react to their first sighting of a Colorado rhodocrosite (MnCO<sub>3</sub>)? As can be seen by their chemical formulas, they all share what is called the "carbonate ion", or CO<sub>3</sub>.

**Nitrates:** Weird stuff. All examples contain Nitrogen as part of their chemical formula and all are basically unstable anywhere where civilization as we know it exists. You can't keep this as a

collection unless you live in a desert, or a refrigerator, or in zero humidity, or a combination of all three. Most common example is probably that fuzzy crust you see on dry lakes or old walls in western ghost towns. That's usually niter ( $\text{KNO}_3$ )

**Borates:** One of the great and usually unrecognized sources of mineral wealth in California. I wonder if the value of borates mined in this state exceeds the value of gold. Some one please ask Jim Minnette next time you see him. Anyway, these minerals obviously contain boron as a critical part of their composition. Best example is borax ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ ). Once again a tough group to collect due the fact that all the members have a tendency to either lose or gain water from the atmosphere.

**Phosphates:** We're talking COLOR! here. Reds, greens, blues, you name it. This group and its companions, the **arsenates**, and **vanadates** are among the most colorful in existence. Their drawback is that many of are rare and/or microscopic. apatite ( $\text{Ca}_5(\text{F,Cl,OH})(\text{PO}_4)_3$ ) is probably the most common phosphate, mimetite ( $\text{Pb}_5\text{Cl}(\text{AsO}_4)_3$ ) the most common arsenate, and vanadinite ( $\text{Pb}_5\text{Cl}(\text{VO}_4)_3$ ) the most common vanadate. As can be seen by their formulas the ratio of phosphorus, arsenic, and vanadium to oxygen is always one to four.

**Sulfates:** A large grouping of minerals with the key chemical ratio of one part of sulfur to four parts of oxygen. The poster child of this group would be barite ( $\text{BaSO}_4$ ). I've only been attracted to various forms and colors of barite of this group; but some of the others, gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), for example, can turn some people's heads. Because of similarities in structure, the chromates; crocoite ( $\text{PbCrO}_4$ ), et al are sometimes grouped with the sulfates.

**Tungstates:** As is true of the phosphates, this group is not without friends; in this case the **molybdates**.

Two of my personal favorites live in these groups: scheelite ( $\text{CaWO}_4$ ), the representative tungstate, and everyone's favorite wulfenite ( $\text{PbMoO}_4$ ) weighing in for the molybdates. Wait a minute!, you ask, I've noticed that both of these have the same ratio of tungsten and molybdenum to oxygen as do the phosphates and their kin. Why aren't these phosphates? Reason: In this group the calcium (Ca) and lead (Pb) can substitute to varying degrees with the tungsten and molybdenum while in the phosphates there is no substitution in that area. Sorry to bore you; but we'll be able to pass on that boredom to others, so it isn't really a loss.

**Silicates:** As stated above, the Danas and their successors never dealt with the silicates. Only in recent times has there been true definitive work done with this group. Therefore, when the spirit (and the editor) moves me, I will return to these pages with a breakdown of these minerals. Meanwhile, who can tell me what other highly desirable family of minerals have boron as a critical part of their structure. I know that Ann Meister reads this stuff and will know immediately; but who else does?

## MEET MEMBERS WAYNE AND DONA LEICHT

*Editor's Note: This continues a series to profile our member dealers who, because of their demanding schedule or their location cannot attend monthly meetings as often as everyone would like.*

KRISTALLE was established in Laguna Beach, California, in 1971 by Wayne and Dona Leicht with the goal of providing a place for serious collectors to view, compare and purchase high quality minerals, gems, fossils, books and shells. The gallery serves to educate the public about the hobby of collecting specimens of natural history. The physical facility at the Laguna Beach location has expanded almost threefold in the past 28 years and has established itself among the top natural history galleries in the world. In 1994 the establishment was moved to even larger permanent quarters in an historic building which the Leichts purchased on the north end of town on Pacific Coast Highway.

Wayne, a mineral collector since age 7, earned his degree in Earth Science at the University of California, Long Beach, and graduated with honors in 1976. He worked in low temperature physics for Aeronutronics and earned several patents in the development of an extremely sensitive magnetometer utilizing super conductive devices. He served with U.S. Army Intelligence for three years in Baltimore, Maryland and later in Washington D.C.

The Leichts have been married since 1964 and they have one son David, born in 1969. In addition to minerals, their other interests include collecting rare books, specializing in Earth Science, the California Gold Rush period, and early California landscape paintings. They have a private collection of minerals with special emphasis on specimens of crystallized gold from all over the world. Wayne has earned a high degree of regard among his peer group and professionals for his knowledge of gold specimens, and he receives more requests for speaking engagements, articles and appraisals than their demanding schedule can accommodate.

Almost every major museum in the world is counted among Kristalle's customers. Kristalle has on many occasions been asked to market specimens for museums as well as many famous private collections including those of Dr. Frederick Pough, Reno, Nevada, Dr. Richard Gaines, Pottstown, Pennsylvania, Richard Bideaux, Tucson, Arizona, Dr. Peter Bancroft, Fallbrook, California and the very extensive collections of E. Mitchell Gunnell of Denver, Colorado, and Robert Deidrick of Oakland, California.

Wayne serves as a Board member of the Gem and Mineral Council of the L.A. County Museum of Natural History and both Wayne and Dona are members of the prestigious Fellows of the Bowers Museum in Santa Ana, California. Their list of board memberships, awards and life memberships is extensive and include many world class institutions and organizations. They have been actively involved with MSSC, having served as both President and Vice President, and were elected to Life Membership in January, 1995.

Although Kristalle and its proprietors are widely known for their world class offerings, they do not ignore tomorrow's collectors. There are always specials for beginners, very affordably priced, along with knowledge they are pleased to share. Wayne and Dona's web site is <http://www.kristalle.com>, and their e-mail address is [leicht@kristalle.com](mailto:leicht@kristalle.com). The gallery is at 875 North Pacific Coast Highway, Laguna Beach, CA 92651, telephone 949-494-7695.

### **THE MSSC NEEDS YOUR HELP!**

The Show is just around the corner and the MSSC needs volunteers for the following:

<b>Day</b>	<b>Date</b>	<b>Time</b>	<b>Job</b>	<b># Needed</b>
Thursday	18	10:00-2:00	Set-up	4
Thursday	18	2:00-6:00	Set-up	4
Friday	19	8:00-2:00	Security/Dealer ck-in	6
Friday	19	2:00-8:00	Security/Dealer ck-in	6
Saturday	20	8:00-10:00	Security/Dealer ck-in	4
Saturday	20	10:00-12:00	* see note below	6
Saturday	20	12:00-2:00	*	6
Saturday	20	2:00-4:00	*	6
Saturday	20	4:00-6:00	*	6
Sunday	21	10:00-12:00	*	6
Sunday	21	12:00-2:00	*	6
Sunday	21	2:00-5:00	*	6
Sunday	21	5:00-8:00	Assist Move-out/ ?	4

- Available jobs during the show are: MSSC Booth (2), Kid Rock Booth (2), Ticket Taker (1), Distribute Program and Door Prize Sign-up Form (1).

Sign up early to get the time and job you want!

Jim can be reached at 626-449-9197, or Fax at 626-449-5484, or by e-mail at: [jeschlegel@earthlink.net](mailto:jeschlegel@earthlink.net).

## CALENDAR

September 10: MSSC monthly meeting, 7:30 p.m., Geology Building, Pasadena City College.

September 25, 26: Delvers Gem & Mineral Society Show at Woman's Club of Downer, 9813 Paramount Blvd. Sat. 10 - 5, Sun. 10 - 4. Manfred Dexling (562) 425-0192

October 8: MSSC monthly meeting, 7:30 p.m., Geology Building, Pasadena City College.

October 9, 10: Valley Gems Show, 9050 1/2 West Ave. J, Lancaster. Sat. 9 - 5, Sun. 9 - 4. Connie Wilhelm (661) 942-1570

October 9, 10: Searles Lake Gem & Mineral Show, Trona, 13337 Main Street, Sat. 8 - 5, Sun. 8 - 4. Bonnie Fairchild (760) 372-5356.

October 16, 17: Whittier Gem & Mineral Society "Golden Anniversary Show," 7604 Greenleaf Ave. Sat. 10 - 6, Sun. 10 - 5. Jay Valle (626) 336-3714, [jvalle@aqmd.gov](mailto:jvalle@aqmd.gov).

October 17: MSSC Board of Directors' meeting, 2 p.m. at Ron Pellar's home.

October 17: Woodland Hills Rock Chippers Show, Canoga Park Community Center, 7248 Owensmouth Ave. Sun. 10 - 5. Mary Backus (805) 578-9886, [mbackus@pacbell.net](mailto:mbackus@pacbell.net).



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