# Bulletin of the Mineralogical Society of Southern California

**Volume 74 Number 4** **April 2004**

**The 794th Meeting of The Mineralogical Society of Southern California**

**"Tourmaline -- News from the Tourmaline Group" by Dr. Andreas Ertl**

**Friday, April 30 at 7:30 p.m.**

***Please note the special date!***

**Geology Department, E-Building, Room 220**
**Pasadena City College**
**1570 E. Colorado Blvd.**
**Pasadena**

## Inside this bulletin



## April Meeting is All about Tourmalines!

Dr. Andreas Ertl, from the University of Vienna, Austria, will present *"Tourmaline - News from the Tourmaline Group"* on Friday, April 30, 2004, at 7:30 p.m. On this

special meeting date, Dr. Ertl will focus on brand new European localities for the aluminum-rich tourmaline, olenite, (including boron-rich, Mn-rich, Fe-rich, and Mg-rich varieties), and new localities for unusual compositions of elbaite, dravite, and liddicoatite. Also, information will be presented about the new tourmaline "oxy-rossmanite". Pictures of these tourmalines will be shown, the geological-petrological aspects of these unusual localities will be discussed, and interesting features of the tourmaline structure will be explained. He will also explain how a mineral collector can recognize how a tourmaline can be assigned as olenite. This talk is aimed at mineralogists, mineral collectors, and all people who are interested in tourmalines.

Andreas Ertl is an enthusiastic and engaging speaker who has published a dozen papers on tourmaline in the past 4 years. He has presented talks about tourmaline in Austria, Switzerland, France, Germany, Slovakia, Czech Republic, and the USA.

## May 5th Special Meeting

Our May meeting will be a special joint event with the Gem and Mineral Council of the Natural History Museum of Los Angeles Counts. The date is Wednesday, May 5, 2004, and the place is the Natural History Museum. The evening will begin at 7:00 pm with refreshments and viewing of the Hall of Gems and Minerals. This will be followed by "A Passion for Minerals -- Defining Moments in the Life of a Mineral Fanatic" by Bill Larson. Bill will describe some of the highpoints in his mineral collecting career including his early experiences in collecting, the people who helped shape his collecting obsession (Sinkankas, Bancroft, Desautels,

Wilber, Embry, Scripps, etc.), and his most exciting experiences (the Blue Cap pocket, developing the Himalaya, mining boleite, surviving the Urals, trapsing around Burma, etc.).

Mark your calendars now for this special event that replaces our regular May meeting. More information will follow in the May Bulletin.

## Minutes of the March Meeting

The 793rd meeting the Mineralogical Society of Southern California was held on Friday, March 12th in the Geology department at Pasadena City College. President Jo Anna Ritchey brought the meeting to order at 7:30 pm. This meeting had a particularly good turnout with 10 new guests.

Jo Anna then announced future meeting times for the MSSC. The April MSSC meeting has been moved to April 30th. The May meeting will be held on May 5th at the Los Angeles County Natural History Museum as a joint meeting with the Gem and Mineral Council.

Show chair Justin Butt then gave a quick update on the show's status. The show will be held on October 16th and 17th at the Long Beach Convention Center. With Justin's hard work much progress is being made towards another great show.

The facilities in which the show will be held will be about 57,000 square feet, so as to accommodate many vendors easily as well as Kid Rock.

Vice President Jim Kusely then introduced this month's special speaker, Dr. Mary Johnson. Dr. Johnson is a former President of the MSSC and works at the Gemological Institute of America in Carlsbad, CA. Dr. Johnson gave a dazzling talk on her trip to the Northwest Territories of Canada and her experiences with the search for diamonds.

Her adventure takes place during a week in June 2003 at the 8th International Kimberlite Conference in British Columbia. During her trip she traveled 6300 km by tour bus

and air and visited prospects as well as diamond mines. The rock of interest on her travels of course was kimberlite, an intrusive igneous rock that can often contain diamonds. Commonly most of the diamonds in Canada are found in Archean and Proterozoic aged rock. The first stop on her trip was Mountain Lake, which had two intrusion bodies dated about the Late Cretaceous. The rock in this area was somewhere between a kimberlite and a lamproite in composition. This area had been evaluated by DeBeers and was found not to be economical. To determine if diamonds are economical the diamonds are extracted and taken to Antwerp to be evaluated.

Buffalo Head Hills was the next stop on the trip, a diamond locality in the middle of a natural gas field. The Cretaceous muddy sediments are said to posses an odor similar to that of the La Brea tar pits. The area's topography consists of muddy swamps and the occasional hill. One such outcrop in the locality, named the K-6, once yielded a yellow octahedron diamond at 0.76 carats. Because Buffalo Head Hills is a natural gas field there is oil bearing material cutting through the kimberlite forcing digging to cease beyond 200 meters.

The next stops on the trip were to Snap Lake and Lac de Gras. At Snap Lake the main deposit is under the lake. So the diamonds must be extracted under ground. It's an intruded dike with kimberlite margins that are a bit foliated. During her discussion about Lac de Gras we learned about diamond indicators. Diamonds sometimes can be found with associated minerals such as chrome diopside, garnet, and ilmenite. Along with various indicator minerals, another interesting fact is that diamonds have varying values at different localities. At the Ekati mine in Lac de Gras the diamonds were valued at $35 a carat while at the Diavak mine they are valued at $100 a carat. After the great talk from Dr. Johnson she left various specimens out for the guests and members to view of kimberlite from Snap Lake, a diamond, and a core sample from Diavak.

The door prizes for this month went to all the visiting guests and member Sarah Griffis, congratulations.

At 9:02pm the meeting was brought to a close.

*Respectfully submitted by Ilia Lyles, Secretary*

## Minerals on Mars

***by Janet Gordon***

It doesn't seem that minerals make the news very often, but the success of the Martian rovers Spirit and Opportunity has brought a number of them into public view. Early in the mission, there was much talk about hematite as a possible indicator of the former presence of liquid water on the red planet. This surprized many of us who have seen the hematite coated sands of the southwestern United States or the more vividly red sands of the Australian outback and associate hematite with a present desert environment. Envisioning hematite-stained sand dunes on the Mars is easy, but considering hematite is an indicator of abundant liquid water less likely. However, the Mars mission scientists have a different view, claiming that grey hematite indicates a history of liquid water on the Martian surface.

The difference between grey and reddish hematite is essentially the larger size of the grey crystals. Grey hematite gives a red-brown streak when powdered. Mineral collectors enjoy beautiful hematite formed in with hydrothermal ore deposits or metamorphic rocks, but there is also abundant grey hematite found on Earth that formed as part of a marine sedimentation processes. For example, there is grey hematite in the extensive Clinton Formation of Silurian age that outcrops intermittently from New York to Alabama. Also, grey hematite is abundant in the vast banded iron formations (BIF) of Precambrian age. So grey hematite may form in the

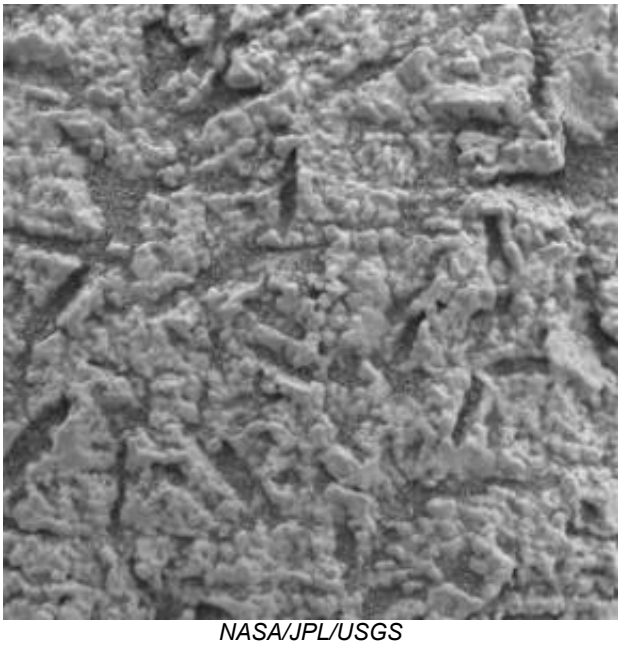
presence of liquid water, and it is more likely to have done so when it is covers wide areas, as remote-sensing data indicates it does on Mars.

Now that the rovers have had time to take a closer look at their surroundings, more than hematite has entered the picture. In a modest start, Spirit scraped into a dark volcanic rock called "Humphrey" in Gusev Crater that showed bright material in interior crevices and cracks. These unidentified minerals were interpreted as having formed in the presence of some sort of water a short or long time after the rock formed.

In the meantime, Opportunity was winning the mineral collecting race as it explored Meridiani Planum. A spectrum taken with its Moessbauer spectrometer shows the presence of jarosite in a collection of rocks dubbed "El Capitan." On Earth jarosite, $K_2Fe_6^{3+}(SO_4)_4(OH)_{12}$, typically forms as an alteration of pyrite in oxidized zones and less commonly as a low-temperature hydrothermal mineral which may be found around hot springs. Three other phases also identified in this spectrum are a magnetic phase attributed to an iron-oxide mineral, a silicate phase containing $Fe^{2+}$, and an additional unidentified phase containing $Fe^{3+}$.

Elsewhere, Opportunity's alpha particle X-ray fluorescence spectrometer detected concentrations of magnesium and sulfur in excess of that in local soils. This has been attributed to the mineral kieserite, $MgSO_4 \cdot H_2O$. On Earth kieserite is one of the many minerals that form when seawater evaporates, and it is typically found in ancient marine salt deposits. In addition, high concentrations of chlorine and bromine have been found in the rocky outcrops. These elements could be constituents of other evaporite minerals.

For those who like mineral pictures, perhaps the image taken by Opportunity's microscopic images that shows a portion of the rock outcrop known as "Guadalupe" is the most intriguing. It clearly shows cavities where crystals appear to have dissolved out of the rock. They look much like casts of anhydrite in limestone sequences on Earth.

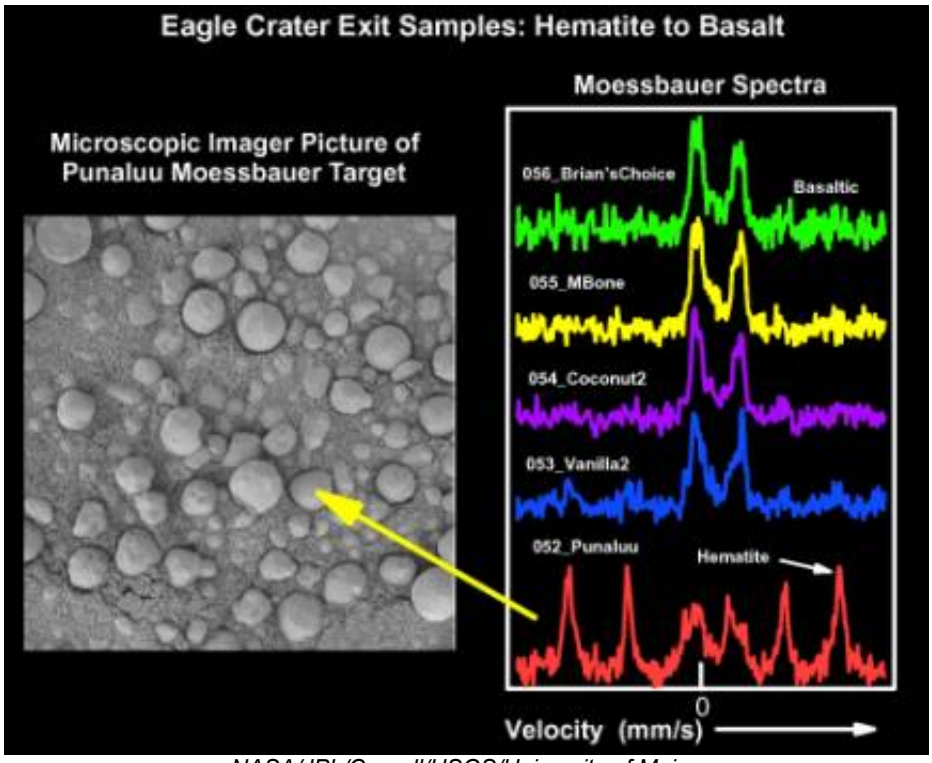


*NASA/JPL/USGS*

*Combined microscopic images of the "El Capitan" outcrop surface showing depressions that can be interpreted as molds of a dissolved mineral.*

And last but not least, what are all those "blueberries" in the news? Moessbauer spectroscopy shows that these BB-sized spheres contain large amounts of hematite. Their distribution in the outcrops and concentration as weathering products on the surface is analogous to concretions found in sedimentary rocks. Although iron-oxide concretions on Earth are much less abundant that those formed by calcite, they are not uncommon.

As a whole, the data gathered by the remarkable robotic geologists, Spirit and Opportunity, give compelling support to the hypothesis that Mars was once a planet where liquid water played an important role. What remains are the mineral residues of these desiccated seas and many more questions to be answered.




*NASA/JPL/Cornell/USGS/University of Mainz*

*These spectra represent soil measurements taken from the center of Eagle Crater out to the rim. The top spectrum from the center of the crater is typical of basaltic material, and bottom spectrum from the crater rim at Punaluu indicates a high concentration of hematite. This corresponds with an increase in "blueberry" concentration, thus it is inferred that the small spheres (which are actually grey) are largely hematite.*

The Martian data for this article and the images were compiled from the *Mars Exploration Rover Mission* website.

## Remembering Fred DeVito

We regretfully announce the passing of Fred DeVito on March 20, 2004. Fred was a long-time MSSC member and a former president who made many significant contributions to the Society. A knowledgable and enthusiastic micromounter, he regularly wrote a column for the Bulletin called "Microscoop" during the 70's and 80's. The series included many articles on collecting in the Santa Monica Mountains. He also wrote articles for the "Microprobe" published by the North West Microminerals Study Group. Recently he was serving on the Board of the California State Mining Museum and was instrumental in helping them acquire suitable specimens. He will be remembered for his cheerful attitude, warm friendliness, and sense of humor. We send our condolences to his family and friends.

# The Darwin Tungsten Area

## Part I: Economic Geology & History of Mining

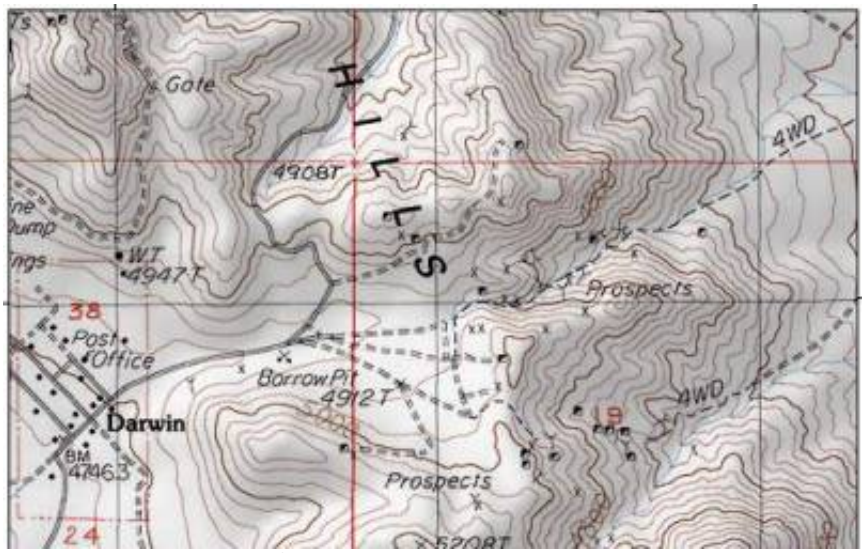
### by Walt Margerum

In the past I have reported on my collection trips to some of the mines in the Darwin Tungsten Area. I now intend to provide an overview of the geology, history, mines, and mineralogy of this area.

The tungsten area is located in the lower Darwin Hills to the East of the town of Darwin, primarily in section 19, T19S R41E, and section 24, T19S R40E, Mount Diablo Meridian. With several exceptions the principal mining activity has been for tungsten, and it occurred from just prior to World War II

until the end of the National Strategic Mineral Stockpiling Program in the 1950's. The mines are the Alameda, Chipmunk, Custer, Durham, Fernando, Giroux, Hayward, Kingman, Lucky Lucy, St. Charles, and Toga.

Mining at the Custer, and early work on the Fernando and Durham were for lead-silver. Mining at the Kingman, Giroux, Lucky Lucy, and early work on the Alameda were for copper. Scheelite was the primary ore in all the others.




Map of the Darwin Tungsten area
(Reprinted from the USGS Darwin Quadrangle)

Note: All the following paragraphs in *Italics* are from Hall and MacKevett (1958).

### Economic Geology of the Deposits

*Geologic Setting*

*Most of the tungsten deposits in the Darwin district are within metamorphosed rocks of the upper part of the lower member of the Keeler Canyon formation of Pennsylvanian and Permian age close to the eastern contact of the stock of the*

*Darwin Hills. The rocks consist of calc-hornfels, marble, and tactite that are metamorphosed equivalents of interbedded silty and sandy limestone, limy shale, and pure limestone. The metamorphosed zone extends about 3,000 feet east of the stock. The calc-hornfels is derived from limy shale and silty and sandy limestone. The relatively pure limestone `beds are in part unmetamorphosed, but in most places they are recrystallized to marble or altered to tactite.*

*Calc-hornfels is the predominant rock type. It is a light-gray to greenish-gray dense rock with a wide range in mineralogy depending upon the original composition of the rock.. In general, the calc-hornfels is composed of diopside and wollastonite with lesser amounts of garnet, oligoclase, scapolite, tremolite, and relict calcite. The pure limestone beds are partly recrystallized to a gray, medium-grained marble. Locally the marble and limestone are replaced by tactite within a few hundred feet of an intrusive contact close to the intersection of faults. Most of the tactite is a garnet or idocrase rich rock, but some contains epidote, diopside, wollastonite, and calcite. The garnet is andradite.*

*The eastern contact of the stock of the Darwin Hills is very irregular. Many small dikes and sills extend as far as 1,500 feet east of the main intrusive body, and the tungsten deposits are localized close to these off shoots. A group of dikes and small, irregular intrusions extend east of the main stock on the St. Charles claims. A sill of quartz monzonite is 160 feet east of the Durham glory hole, and an irregular intrusion crops out along the ridge between the Durham and Chipmunk mines …..*

*The Paleozoic rocks have been tilted into an overturned section that strikes north and dips 30° to 78° W. as described under the subtopic "Geology" in the section on the Darwin lead-silver-zinc district. Numerous faults that strike N. 60° E. to east and dip steeply either north or south cut the rocks, but the displacement along the faults is small. Slickensides are nearly horizontal, and the displacement is predominantly left lateral.*

This description is also applicable to the lead-silver, and copper deposits in the area.

Geologic Map of the Darwin Tungsten Area
(Reprinted from CDMG Special Report 51)

**Geology of the Ore Bodies**

Tungsten Ores

*Scheelite ore bodies are found as replacements of pure limestone and tactite beds close to the intersection with N. 70° E.-striking faults and within the N. 70° E. faults mostly where the wall rock is pure limestone or tactite. Most of the ore is found within 3 1imestone beds locally known as the Durham, Frisco, and Alameda beds.... Only the Durham ore body is known to extend more than 60 feet vertical…. The Durham and Alameda ore bodies are replacements of pure limestone and tactite beds close to the intersections with the Fernando shear zone. The Durham ore body is a replacement of the footwall of the Durham limestone bed where it is in contact with calc-hornfels. The ore body is exposed for 350 feet at the surface and has been mined to a depth of 350 feet where the ore body is only 30*

*feet long…. Its thickness ranges from 21 to 35 feet.*

*Three ore bodies that are replacements of the Alameda bed near N. 70 E. faults have been mined. Two are at the intersection of the Alameda bed with Fernando shear zone; the third is 1,000 feet northwest of the Fernando shear at the Alameda shaft. The largest of these ore bodies is at the intersection of the Alameda bed with the Fernando shear 950 feet S. 80° W. of the portal of the Fernando adit. It has been developed by an open cut 50 feet long parallel to the strike of the enclosing limestone, 60 feet wide, and about 20 feet deep. A drift was being driven in 1955 under the pit to develop ore that remained at the bottom.*

*The ore in the St. Charles-Hayward area is in N. 70° E. faults that dip steeply to the northwest…. The largest ore body is developed by the St. Charles No. 1 workings…. The ore shoot was 140 feet long, 2 to 10 feet thick, and was mined from the surface to an average depth of about 30 feet. Most of the scheelite exposed in the St. Charles No. 2 and St. Charles No. 3 workings is in thin veins or streaks along N. 70° E. faults, and no scheelite is disseminated in the wall rock between faults…. The streaks range from a fraction of an inch to 6 inches thick and can be mined only by highly selective methods or where fractures are sufficiently close that several can be mined together. Some of the streaks contain 10 to 30 percent WO3, but the grade of ore over a mining width would probably average only about 0.2 to 0.3 percent WO3.*

Lead-Silver Ores

*The ore body at the Custer mine is in calc-hornfels and is parallel to bedding. The bedded deposit consists predominantly of coarse calcite and quartz with pockets and interstitial material composed of cerussite, galena, limonite, jarosite, pink and green fluorite, and locally minor amounts of malachite. The calcite is gray to white in color and commonly occurs as rhombohedrons 12 to 24 inches on a side. Some scheelite is exposed in the winze.*

*The ore body is inconspicuously exposed at the surface. On the 50-foot level it is approximately 60 feet long and 6 to 10 feet thick, and is stoped for about 30 feet above the level. The shape of the ore body is lenticular in plan view, and it has a long axis that pitches nearly straight down the dip. The bedded deposit is strong on both the 200-foot and 300-foot levels. On the 200-foot level it is 110 feet long and is terminated on the north by a pre-mineral fault that strikes N. 70° E. and dips 75° N. The thickness of the ore body is erratic. Within a few feet it ranges from a few inches to 10 feet thick. The ore body is stoped for about 70 feet above the level and for 18 feet below the level. On the 300-foot level the lead content of the ore body has decreased, and the bedded deposit consists mainly of quartz and calcite. It is 150 feet long and a maximum of 40 feet wide. Locally it contains pockets of galena and cerussite. The calcite-quartz vein extends to the 400 level, but it carries very little lead at this depth except locally at the northwest end….*

Copper Ores

*The* [Giroux] *mine is along a contact between iron stained plutonic rocks of the stock of the Darwin Hills to the northeast and calc-hornfels of the Keeler Canyon formation to the southwest. A garnet-rich tactite zone 1 foot to 6 feet thick is locally along the contact. The workings develop small oxidized veins and irregular iron stained zones. A 2-foot thick vein explored by the inclined shaft strikes N. 55° W. and dips 42° SW. parallel to bedding in the calc-hornfels. Minor cross fractures cut this vein but cause negligible offsets. Another vein is exposed in a cut about 50 feet S. 43° W. of the main shaft. This vein strikes N. 80° W. and dips 40° SW. It is 3 feet thick and can be traced for 30 feet on the surface.*

*The* [Kingman] *prospect is in calc-hornfels and tactite of the Keeler Canyon formation near the contact with the stock of the Darwin Hills. Copper minerals are in two iron stained veins 1 foot to 4 feet thick and in smaller quantities as fracture coatings in tactite. One of the veins strikes N. 20° W. and dips 70° NE., and the other strikes N. 85° E. and dips 75° SE.*

History of Mining

The earliest mining in the district was for lead-silver ore in the 1890's. The Custer mine started production in 1893, and continued until about 1949. The recorded production was 141.57 oz. gold; 16,615 oz. silver; 6,622 lbs. copper; 96,614 lbs. lead; and 72 lbs. zinc. The Fernando mine also had some (1919-1920) lead-silver production. The Alameda, Kingman, and Giroux were developed during the late 19th and early 20th centuries for copper but none of them had any significant production. No production has been reported from the Lucky Lucy, and the size of the pit indicates there was none.

*Although scheelite was recognized in the Darwin silver-lead district during World War I, the deposits remained undeveloped until 1940. At this time Frank Watkins purchased*

*a group of patented claims on the east side of the Darwin Hills at a tax sale, relocated additional claims, and with C. W. Fletcher and others organized the Darwin Consolidated Tungsten Company to develop the tungsten. In 1941 the E. L. Cord interests under the name Pacific Tungsten Company leased 23 mining claims from the Darwin Consolidated Tungsten Company, and during the ensuing twelve months they produced 30,940 tons of ore that averaged about 1 percent WO3. The ore was treated at a mill near Keeler owned by the West Coast Tungsten Corporation. This production was principally from the Durham, Fernando, St. Charles, and Hayward claims. Possibly 25,000 tons of tungsten ore has been mined in the district from 1944 to 1955.*

*Howard Miller and Louis Warnken leased the Durham-Fernando and St. Charles groups of claims from 1951 to 1953, and the Hayward and St. Charles group during 1951-1955. They erected a mill in Darwin Wash from which they recovered approximately 2,475 units of WO3 from 1952 through 1954. The Ajax Tungsten Corporation, C. H. Hall, president, obtained a lease on the Durham and Fernando properties in 1954 and shipped some ore.*

Since then there has been little or no production, and all of the mines are now idle.

**References**

Hall, Wayne E. and Mackevett, E. M. (1958) “Economic Geology of the Darwin Quadrangle Inyo County, California; California Division of Mines, Special Report 51, 73 pp

Hall, Wayne E. and Mackevett, E. M. (1962) “ Geology and Ore Deposits of the Darwin Quadrangle Inyo County California”; United States Geological Survey Professional Paper 238, 87 pp



## Field Trip Report: Collecting at the Boron Pit

**By Walt Margerum**

Thirty-two MSSC members met at the US Borax Visitors Center at 9:00 AM on Saturday March 27, 2004, for the much anticipated field trip. After a short introduction by Tim Cotton, the US Borax Mine Technical Services Manager, Joe Siefke, Senior Geologist at US Borax and our trip leader, gave a description of the geology and minerals of the pit. A drawing was then held for 5 lucky members who received unique specimens of ulexite after borax.

We then packed ourselves, and packed is the correct term, into two US Borax crew buses and traveled to our first destination: the bottom of the pit.

US Borax Visitors Center.

At this location we collected kernite and probertite from a pile of ore that had been selected for us by Joe. After we filled the buses to saturation, we then slowly ascended to the Visitors Center to offload our cargo and to eat lunch. Our next location was one of the dump areas to collect ulexite and whatever else we could find. The ulexite was mostly what is called TV rock. The whatever else ranged from calcite, many of them very showy, to realgar, and several as of yet


The Boron Pit from the top.

unidentified minerals. One noted micro-mineralogist, whose initials are Bob Housley, was seen carrying a 20 pound micro having many vugs of very nice calcite crystals. A new member, Herman Ruvalcaba, collected what Joe said was one of the largest calcite crystals he'd seen from the pit and several unidentified specimens that Joe said he would have identified. From the amount of material removed, several members seem to be starting their own borax operations.

Every one I talked to said it was a great trip. We want to thank US Borax for making this trip possible, and especially Joe Siefke for organizing and leading us.

This is hopefully only the first of many field trips the MSSC will conduct. Preparations are being made for a trip to the Blanchard Mine in November, and

discussions are in progress for a trip to the Champion Mine, possibly in September. If you know of any other good locations please contact me by e-mail at wmargerum@earthlink.net or bring it up at the next meeting.

Hard at work in the pit.

2004 Calendar of Events

April 3-4, San Jose, CA, Santa Clara Valley Gem and Mineral Society, Santa Clara County Fairgrounds, 344 Tully Road, Hours: Sat. 10 - 6; Sun. 10 - 5, John Eichhorn (408) 749-0523 / johneichhorn@earthlink.net

April 3-4, Torrance, CA, South Bay Lap & Mineral Society, 55th, Nature's Treasures, Torrance Recreational Center, 3341 Torrance Blvd., Hours: 10-5 both days, Omer Goeden (818) 383-9279 / sageit@aol.com

April 10-11, Paradise, CA, Paradise Gem & Mineral Club, Veteran's Memorial Hall, Skyway & Elliot, Hours: Sat 10-5 Sun 10-4, Anita Carter (530) 872-1983

April 17-18, Mineral Locality Symposium, sponsored by the Southern California Chapter of the Friends of Mineralogy at Shoshone Museum -- Flower Building Center Hwy 127, Shoshone (south of the Red Buggy Cafe). Speakers and activities on Sat. beginning at 9 am; Sun. field trip to Tecopa Opal Beds and Emigrant Pass trilobites led by Bennie Troxel, geologist extraordinair. Registration $5 per day. Bob Housley rhousley@its.caltech.edu 626-449-6454 or http://www.mineralsocal.org/scfm/.

April 23-25, CFMS Field Trip South -- Cady Mountains to collect red and yellow agate, jasper, opalite, calcite rhombs, green fluorite, and much more. Leader: Bob Fitzpatrick, rurocky2@aol.com, (909) 845-3051.

April 23 - 26, The 2004 Desert Symposium will be held at California State

University's Desert Studies Center at Zzyzx, on the shores of Soda Lake south of Interstate 15 between Barstow and Baker, California. The symposium will feature current research on archaeology, anthropology, paleontology, geology, ecology, biological sciences, and environmental issues. Field Trip, Saturday afternoon, Sunday and Monday, April 23, 24, 25, will focus on tectonic structures: faults in the Mojave Desert that range in age from Miocene to Recent. For more information: Bob Reynolds (909) 781-9318, e-mail bob.reynolds@lsa-assoc.com, William Presch, wpresch@Exchange.FULLERTON.EDU.

April 24-25, Hacienda Heights, CA Puente Hills Gem & Mineral Club, Steinmetz County Park 1545 S. Stimson Ave. Hours: 10 - 5 both days Paula Hess (562) 696-2270 / rphess@adelphia.net .

April 24-25, Lancaster, CA, Antelope Valley Gem & Mineral Club, Antelope Valley Fairgrounds, 2551 W. Avenue H, Hours: 9 - 5 both days, Olan Flick (661) 943-3882

April 24-25, Santa Cruz, CA, Santa Cruz Mineral & Gem Society, Santa Cruz Civic Auditorium, Corner of Center & Church Street, Hours: 10 - 5, Sallee Brumbaugh (831) 336-5662.

May 1-2, Anaheim, CA, Searchers Gem & Mineral Society, 48th Annual Gem, Mineral, and Jewelry Show, Brookhurst Community Center, 2271 W. Crescent Ave., Hours: Sat 10 - 5 Sun. 10 - 4:30, Karen Fox (714) 832-3580 / the_rox_fox@yahoo.com

May 1-2, Bakersfield, CA, Kern County Mineral Society, "People are nuggets too," Kern County Fairgrounds, Ming Ave. & P Street, Hours: 10 - 5 both days, 589-3834 .

May 1-2, Bishop, CA, Eastern Sierra Gem & Mineral Club, Tri County Fairgrounds, Sierra Street & Fair Drive, Hours: Sat. 9 - 5; Sun. 10 - 4, Jeff Lines (760) 935-4576 / rockmun@hotmail.com.

May 8-9, Reno, NV, Reno Gem & Mineral Society, Reno Livestock Events Center, Exhibit Hall @ 1350 N. Wells Avenue, Hours: Sat. 10 - 5; Sun. 10 - 4 , Jennifer Rhodes (775) 356-8820.

May 14-16, West Coast Gem & Mineral Show ~ Spring. Holiday Inn -- Costa Mesa, Bristol Plaza, 3131 S. Bristol St, Costa Mesa. Hours: Fri. & Sat 10-7, Sun. 10-5. Martin Zinn Expositions, LLC, Fax (303) 674-2384, mz0955@aol.com, www.mzexpos.com.

May 15-16, Conejo, CA, Conejo Gem & Mineral Club, Borchard Park Community Center, 190 Reino Road, Hours: Sat. 9 - 5; Sun. 10 -5, Don Pomerenke (805) 492-4276.

May 15-16, Yucaipa, CA, Yucaipa Valley Gem & Mineral Society, Yucaipa

Community Center, 34900 Oak Glen Rd., Hours: 10 – 5 both days, Lee Peterson (909) 794-0731 / resØ9ayd@verizon.net.

May 28, Mariposa, CA, CFMS and Mariposa Gem & Mineral Club, Mariposa County Fairgrounds, One hour from Yosemite National Park, California State Mining and Mineral Museum, P.O. Box 1192, Mariposa, CA 95338, (209) 742-7625 / minealmuseum@sti.net Fax (209) 966-3597

June 5-6, Glendora Gems Gem and Mineral Show, Goddard Middle School, 859 E. Sierra Madre, Glendora, Hours: Sat. 10-5, Sun. 10-4