

Bulletin of the Mineralogical Society of Southern California

Volume 74 Number 9

September 2004

**The 799th Meeting of The Mineralogical Society
of Southern California**

"An Evening in Honor of H. Stanton Hill"

Friday, September 10 at 7:30 p.m.

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

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An Evening in Honor of H. Stanton Hill

Please join us on Friday, September 10 at 7:30 for an evening of tributes, reminiscences, and historical perspectives as the MSSC remembers the life of one of its most important founding members, Stan Hill. The Pasadena City College Geology Department will also participate. Dr. Bruce Cater will speak briefly about Stan's thirty-seven year career as a professor and its impact on the quality of

instruction at PCC and elsewhere. We will also view footage from old movies taken on the field trips that made the department famous beginning in 1935.

These presentations will be followed by a reception and mineral viewing in the H. Stanton Hill Geology Museum, where the majority of the department's collection is on display.

MSSC members and Mr. Hill's former students and other friends are invited to contribute tributes, stories, pictures, and appropriate material to the program. Those who wish to participate, but cannot attend the meeting, may forward their contributions to the Bulletin editor.

The Mineralogical Society of Southern California

Presents the 57th Annual
Southern California Gem & Mineral Show
Oct. 16th & 17th, 2004
10 a.m. to 6 p.m.

Long Beach Convention and Expo Center
300 East Ocean Boulevard, Long Beach, California

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Nice Datolite and Natrolite Found in the Saddleback Basalt at Boron

by Robert Housley

During our recent MSSC field trip to Boron a few of us were fortunate to be able to collect some very nice datolite and natrolite specimens. Before describing them let me start with a little background.

The approximately 19 million-year-old Saddleback basalt lies stratigraphically immediately below the extensive borate deposits at Boron (Siefke, 1991). The upper portion of this basalt is vesicular. Because the deposit now dips significantly toward the east, it has proven necessary to remove some of this basalt in developing the current open pit. Naturally the first part to be removed came from the vesicular upper part. For some period of time in the past, collectors had periodic opportunities to collect from these vesicular basalt waste piles. Unfortunately for me, the opportunity ended before I had taken advantage of it.

As could be anticipated from the juxtaposition of borate rich lake waters with basalts

known to be good hosts for zeolites, a number of interesting minerals were found in the vesicles. Those known twenty years ago were described in a talk and a 4-page handout by Wally Kleck and William Wise at the Pacific Micromount Conference in 1984. The vesicle minerals described included mazzite, analcime, heulandite, chabazite, gmelinite, phillipsite, stilbite, greigite, pyrrhotite, ferroan saponite, and rare searlsite, ulexite, borax, rhodochrochite, and calcite. This was the second known world occurrence of the very rare zeolite mazzite, and it still is the second confirmed occurrence. The type locality is in France. Because the vesicles tended to be small, these were mostly micro-minerals. At that time I had not yet developed much interest in micro-minerals.

With this background, I was anticipating the opportunity to look at some of the basalt piles afforded by our recent MSSC

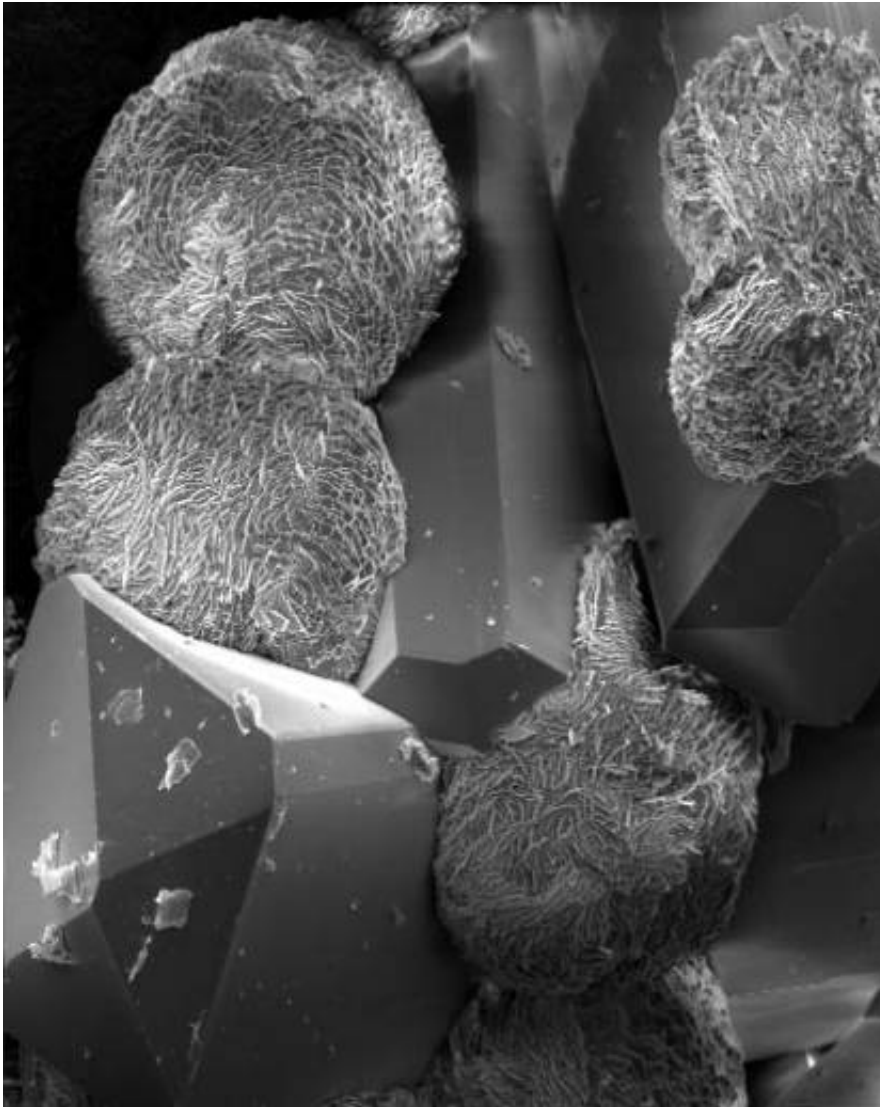


Figure 1. Datalite balls with natrolite crystals.
Field of view is 0.6 millimeters.

field trip with even more excitement than I had experienced earlier in seeing the

actual mining operation and collecting kernite and probertite first hand. After we stopped in the basalt area, my first reaction was surprise and a little disappointment in noticing that none of the nearby basalt seemed to be vesicular and that the main mineralization in it seemed to be in narrow calcite veins.

The disappointment was short lived, however. Right next to the van I spotted a larger segment of a calcite vein with some crystal pockets and began to work. After filling a small box with samples there, I started looking at further basalt piles and on one found a ten-inch ball of calcite with multiple crystal chambers imbedded in clay and added that to my haul. About then Herman Ruvalcaba came back to the van with what had to be the find of the day. As I recall, it was a plate with several large sharp, clear, calcite crystals on a base of natrolite and, at the time, unidentified druzy balls.

Generously, Herman offered to take those of us who were nearby and interested over to where he had found this treasure, and several of us followed off after him. On the rock piles close to his find, I spotted a number of smaller veins containing natrolite and the unknown balls, and I was able to sample 3 or 4 of them before we were called to leave. The others who came along also found some of this interesting material.

After getting home, I could hardly wait to look at the balls in the SEM. Figure 1 shows several of the balls in a cluster of nice clear, sharp natrolite crystals. The field of view is 0.6 millimeters. The surface of one of the balls is shown at higher magnification in Figure 2, with a field of view of 70 micrometers. The EDX spectra of these crystals show only lines for Ca, Si, and O meaning that the balls are either a Ca silicate or Ca borosilicate. That composition information still leaves a lot of possibilities, and because for some reason I did not recognize the crystal habit, I was temporarily stumped. In hindsight I now recall that I had seen similar material from Tick Canyon.

In any case, I recently was able to obtain a large enough clean sample of ball material to obtain an x-ray powder diffraction pattern with the equipment that I have available. The pattern shows a good match with either bakerite or datolite, whose x-ray powder diffraction patterns are very similar. Based

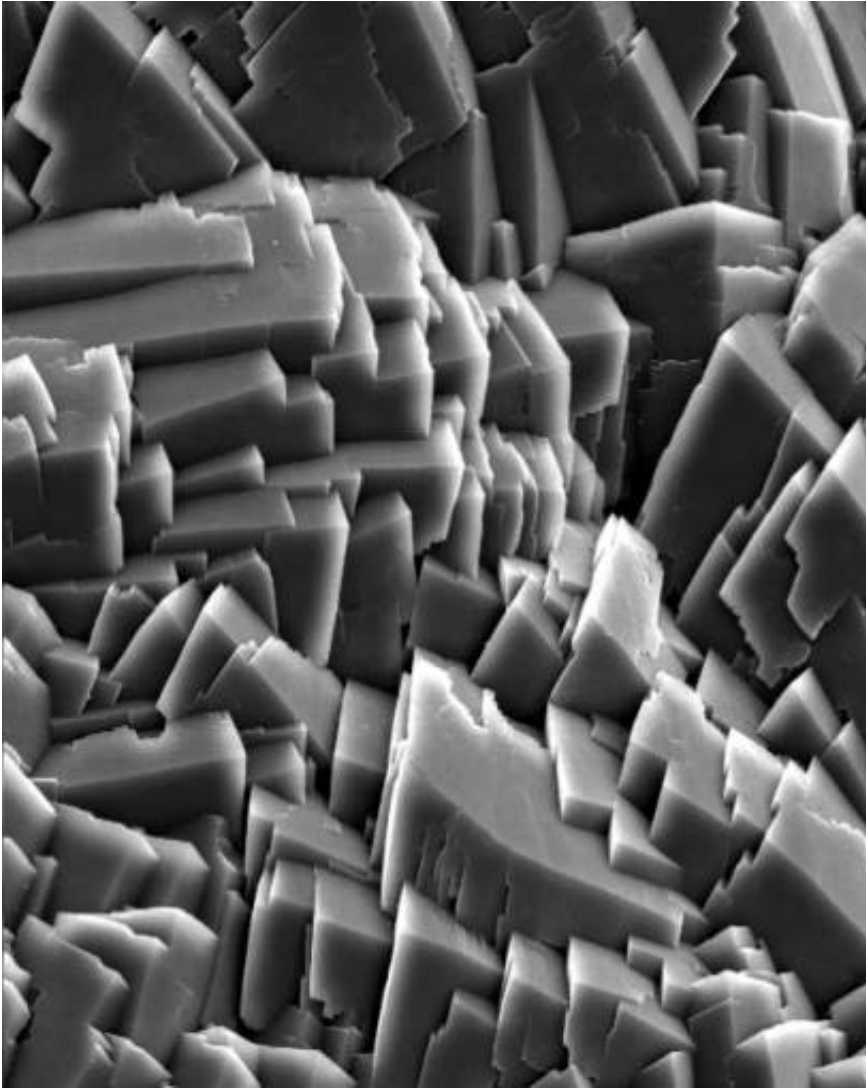


Figure 2. Surface of one of the datolite balls shown in figure 1.
Field of view is 70 micrometers.

on what appeared to be a slightly better match to the bakerite pattern and a similarity in appearance with material at Tick Canyon which has been known as bakerite, I initially felt sure that the balls were clearly identified as bakerite. Now, based on recently published work on the Tick Canyon material, I believe they are datolite. (See note added in proof). Although the mineralogy of Boron has been extensively studied (Morgan and Erd, 1969), datolite has never been reported from there before, and only one very poor piece of natrolite had been found there before.

Thus although I did not find any mazzite as hoped, our MSSC trip did produce new information about the mineralogy of Boron. This information also suggests that boron mineralization extends through a network of cracks deeper into the underlying Saddleback basalt than previously realized.

For the record I list below datolite associations I have seen in the different Boron samples.

Sample 1. This sample consists largely of gray to clear large partially corroded crystals of colemanite embedded in platy pseudo hexagonal calcite. The cavities also contain sugary clinoptilolite-Na and very small amounts of brownish datolite. The clinoptilolite is sometimes enclosed in parts of the calcite blades giving them a cloudy appearance.

Sample 2. This sample consists largely of stout, clear natrolite needles with well developed faces coated with brownish datolite balls. The SEM pictures are from this sample, which is probably my best.

Sample 3. This sample has small analcime crystals with a little natrolite coated with small datolite balls.

Sample 4. This sample has brown datolite balls to 2 millimeters completely imbedded in clear calcite. Also imbedded in the calcite are a few larger blebs of ulexite.

Thus altogether datolite at Boron at least occurs with natrolite, analcime, clinoptilolite-Na, colemanite, ulexite, and calcite. Probably if we had had a little longer we would have found more associates.

For the record, the large calcite chunk I mentioned earlier yielded about a flat of decent specimens of pseudo octahedral calcite, but had no associated minerals.

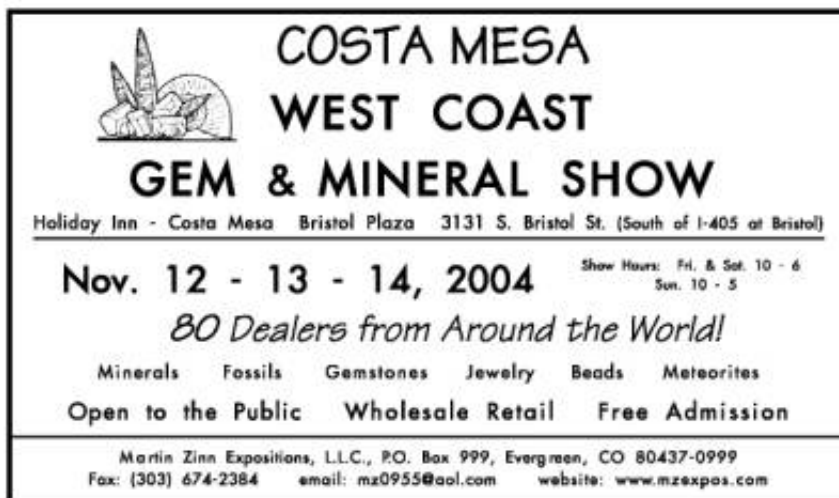
Note added in proof: In a review of the first draft of this report Tony Kampf called my attention to the paper below by Perchiazzi et al (2004) showing that what has been known as crystalline bakerite from Tick Canyon is actually datolite. I now feel that it is most likely that this material is also datolite.

References

Siefke J. W. (1991) The Boron Open Pit Mine at the Kramer Borate Deposit. In "The Diversity of Mineral and Energy Resources of Southern California" Society of Economic Geologists guidebook series vol. 12, pp. 4-15.

Morgan V. and Erd R. C. (1969) Minerals of the Kramer Borate District, California. CDMG Mineral Information Service, vol. 22, pp. 142-153 and 165-172.

Perchiazzi N., Gualtieri A. F., Merlino S., and Kampf A. R. (2004) The atomic structure of bakerite and its relationship to datolite. American Mineralogist, vol. 89, pp. 767-776.



Are You Ready to Volunteer?

Now is the time to make a commitment to help at our show! Here's the scoop.

Friday, October 15

Set up for the show is compressed into one day this year. This means an early start in skirting tables and assembling cases. These tasks need to be completed by 3 p.m. After 3 p.m. volunteers will be needed to help set up the Kid Rock area.

Saturday, October 16

The show starts at 10 a.m. and ends at 6:00 p.m. Volunteers will be needed to man the MSSC booth and kid rock activities. Members are asked to serve for shifts lasting one hour.

Sunday, October 17

Volunteer needs are the same as on Saturday, plus needed labor for take-down beginning at 6 p.m.

How to make this easy and fun for everyone. . .

Don't wait until the last minute to volunteer! If you need to change plans later, adjustments can be made.

Sign up for specific shifts on the next page. The show committee will love you for it!

Remember, almost everyone needs a break from looking at minerals sometime,

and a one-hour volunteer shift is just the thing.

Many hands make light work. Every Society member is needed, and friends are welcome. It's your show!

The Choices: Please choose more than one!

Select the shifts that you would like to serve and then email or phone your choice to Janet Gordon at mssc@mindspring.com or 626-441-6715. Give your name and the activities, days and times in you message. In the unlikely event that a shift is over-booked, you will be contacted.

Friday

General Set-Up

Shift 1A: 10-12:30

Shift 1B: 12:30-3:00

Kid Rock Set-Up

Shift 1C: 3:00-4:30

Saturday

MSSC booth

Shift 2A: 10-11

Shift 2B: 11-12

Shift 2C: 12-1

Shift 2D: 1-2

Shift 2E: 2-3

Shift 2F: 3-4

Shift 2G: 4-5

Shift 2H: 5-6

Kid Rock

Shift 2I: 10-11

Shift 2J: 11-12

Shift 2K: 12-1

Shift 2L: 1-2

Shift 2M: 2-3

Shift 2N: 3-4

Shift 2O: 4-5

Shift 2P: 5-6

Sunday

MSSC booth

Shift 3A: 10-11

Kid Rock

Shift 3I: 10-11

Shift 3B:	11-12	Shift 3J:	11-12
Shift 3C:	12-1	Shift 3K:	12-1
Shift 3D:	1-2	Shift 3L:	1-2
Shift 3E:	2-3	Shift 3M:	2-3
Shift 3F:	3-4	Shift 2N:	3-4
Shift 3G:	4-5	Shift 3O:	4-5
Shift 3H:	5-6	Shift 3P:	5-6

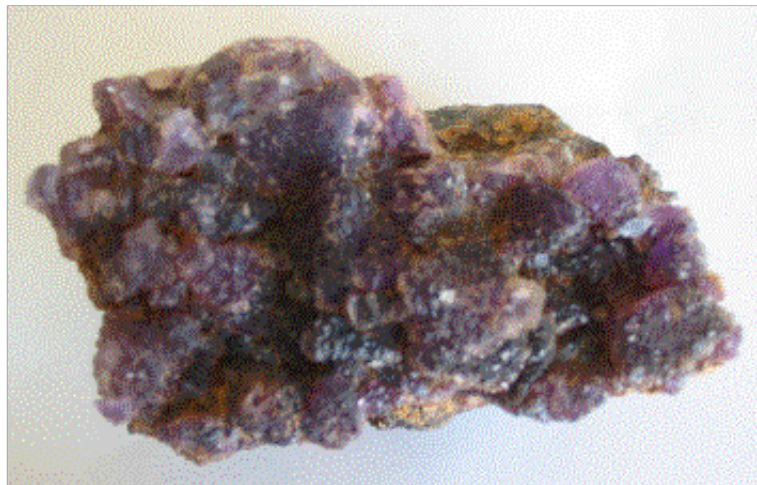
Shift 3X: Take-down beginning at 6.

Update: October Field Trip to Arizona

Save October 23 and 24 for two days of collecting on private mining claims in Arizona. The Saturday location will be near Wickenburg (about an hour northwest of Phoenix). This location produces wulfenite, fluorite, quartz, and vivid fluorescent minerals. Other collecting opportunities in the area include amethyst (mostly massive), malachite sprays, geodes, and coated octahedral fluorite up to 1".



Wickenburg area field trip destination.
(Steve Knox photo)



Purple fluorite from the Spectrum Claim.
(Steve Knox photo)

The second location will be about one-half hour east of Quartzsite. This will allow a shorter drive home on Sunday afternoon. This will be the Spectrum claim and surrounding area for wulfenite, fluorite (blue and purple massive with some cubes), various copper minerals (malachite, chrysocolla), barite, and quartz crystals. The geology is similar to that at the Blanchard mine in New Mexico. The fee for each day will be \$30/person per day with a minimum of 10 people. This is to cover equipment as we are planning to have a backhoe at our disposal. Fees must be paid in advance, and will be handled by Walt Margerum (treasurer and field trip chair). Checks payable to MSSC may be mailed to MSSC, P.O. Box 41027, Pasadena, CA 91114-8027.

2004 Calendar of Events

September 17-19, Denver Gem & Mineral Show, Colorado. Denver Merchandise Mart--Expo Hall, 451 E. 58th Ave. Fri. 9-6, Sat. 10-6, Sun. 10-5.
www.mzexpos.com.

September 17-19, Devore, Orange Belt Mineralogical Society 3rd Annual Gem & Mineral Tailgate, Western Regional Little League Park, 6707 Little League Drive, Bob Woodcox (909) 874-3697.

September 25-26, Downey, Delvers Gem & Mineral Society, Downey Women's Club, 9813 Paramount Blvd., Hours: Sat. 10 - 6; Sun. 10 - 4, Earl Liston (562) 865-1348, E-mail: ejliston5@juno.com.

September 25-26, Vista, Vista Gem & Mineral Society, Brengle Terrace Community Recreation Center, 1200 Vale Terrace, Hours: 10- 5 both days, Mary Anne Mital (760) 758-4599.

September 25-26, Monterey, Carmel Valley Gem & Mineral Society, Monterey Fairgrounds, 2004 Fairgrounds Rd., Hours: Sat. 10 - 6; Sun. 10 - 5, Sky Paxton

(831) 755-7741 / sky@familystones.net.

October 9-10, Antioch, Antioch Lapidary Club, Contra Costa Fairgrounds, 10th and L Streets - in the Flower Bldg , Hours: 10-5 both days, Ramona Bond
ibmomobond@yahoo.com.

October 9-10, Grass Valley, Nevada County Gem & Mineral Society, Nevada County Fairgrounds, Main Exhibit Hall - 11228 McCourtney Rd, Hours: 10-5 both days, Cliff Swenson (530) 272-3752.

October 9-10, Lakeside, El Cajon Valley Gem and Minerals, Lakeside Rodeo Grounds, 12584 Mapleview Road. Hours: 10-5 both days, Peggy Bowery (619) 561-7684 / docsgirl9@aol.com.

October 9-10, Trona, Searles Lake Gem & Mineral Society, Searles Lake Gem & Min. Show Bldg., 13337 Main Street, Hours: Sat. 7:30-5; Sun. 7:30-4, Bonnie Fairchild (760) 372-5356.

October 16-17, Southern California Gem and Mineral Show, Long Beach Convention Center, presented by the Mineralogical Society of Southern California. Hours: Sat. & Sun 10-6. Justin Butt, minwreck@hotmail.com.

Oct 22-24, Riverside, Valley Prospectors of San Bernardino, Rancho Jurupa Park; 4800 Crestmore, Hours: Sat. 9-5; Sun. 9-4, Alice Corey (909) 864-8320, Email: ALPENNYMAE@AOL.COM.

November 12-14, West Coast Gem and Mineral Show, Costa Mesa Holiday Inn, 3131 S. Bristol St., Hours Fri. & Sat. 10-6, Sun. 10-5. mz0955@aol.com, www.mzexpos.com.



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Visit our booth at most major mineral shows!

Tuesday-Saturday: 10-5; Sunday: 12-5 or by appointment-FREE PARKING!!