

THE BADGER DIGGIN'S

The Badger Lapidary and Geological Society, Inc.

Monroe, Wisconsin

Devoted to the Earth Sciences

Vol. 47, No 02

February 2012

President's Message

President's Message

Dear Badgers:

The new year is off to a good start. Our first field trip, to the Burpee Museum of Natural History in Rockford, Illinois, drew a few families on January 28th to view the Ice Age Mammals traveling exhibit. You might see some pictures from that exhibit toward the back of this newsletter, taken by Laurie Trocke. The skeletal reconstructions, including the American mastodon, were impressive, as were the artwork reconstructions of those animals and their glacial environments. The exhibit can still be viewed at the Burpee through April 29, 2012.

On January 21, the officers held their annual planning meeting at our house. Not only meeting programs, but the year's upcoming field trips, have been tentatively planned, by those who have agreed to organize/lead them. A complete list of the year's calendar of events should be found ahead in the newsletter. Perhaps the most interesting (and far away) of those trips are to the agate show in Minnesota (late July) and to Michigan's Upper Peninsula for copper, along with probable mine and/or museum visits (late August). Details concerning individual trips will be forthcoming as their times draws nearer.

For this month's meeting, we are planning an informal **swap-and-sale day**. Bring one or more rock/mineral specimens that you would like to trade or sell for another. They needn't be expensive; anything that you have as surplus just might be what a fellow

member is looking to add to their collection. If this activity proves to be popular, then it might be repeated in the months/years to come.

Because Teri will not be present at the February 11 meeting, she has submitted her show chair's report in advance to the newsletter. *Please note the urgent call for fishpond materials to be submitted*, hopefully at this meeting. Signup sheets for club exhibits will also be available, as well as signups for working at the show itself (front door, sales table, etc.). Please fill out these forms and return them to me by the end of the meeting, or else notify Teri of your intentions. I look forward to seeing everyone at the meeting.

Jordan Marché

BLGS president

Happy Valentine's Day



*"A pretty rock is always nice at Valentine's Day. Or perhaps a better shall
Or—goit—what woman doesn't enjoy a lovely bit of flint?"*

Officer Roster:

President

Jordan Marche'
5415 Lost Woods Ct
Oregon, WI 53575
608-835-2653
jdmarcheii@gmail.com

Vice-President, Field Trip Chair

Dan Trocke
4771 County II
Highland, WI 53543
608-935-0597
dtrocke@acscm.com

Secretary

Ralph Burgener
602 4th Street
Brodhead, WI 53520
608-897-2824
doorstop58@hotmail.com

Treasurer

Daisy Peterson
W4647 County Rd FF
Monroe, WI 53566
608-328-1523
daisyjovilu@gmail.com

Editor

Laurie Trocke
4771 CTH II
Highland, WI 53543
608-935-0597
lor3@netscape.com

Show Chairperson

Teri Marche'
5415 Lost Woods Court
Oregon, WI 53575
608-835-2653
tmarche@usnetizen.com

Officer at Large

Marv Hanner
PO Box 201
Juda, WI 53550
608-934-2001
tnmins@tds.net

Club Calander

- Feb 11th: Meeting: Monroe Library – Club Sale & Swap
- Feb 25th: Field Trip: Madison Museum & Shops
- Mar 10th: Meeting: Trocke's Farm-Fish Pond Bagging
- Mar 31 - Apr 1: Annual Show – Monroe High School
- Apr 14th: Meeting: Monroe Library – Hand Polishing and Other Hand's On Projects.
- Apr 28th: Field Trip: The Grotto in Dickeyville, WI and Graf, IA
- May 12th: Meeting: Monroe Library – Quarry Trip
- May 26th: Field Trip: Belleville, IA
- June 9th: Meeting: Annual Picnic – Monroe, WI
- June 23rd: Field Trip: Door County, WI
- July 14th: Field Trip: Shullsburg, WI
- July 28th: Field Trip: MN – Celebration of Agates Show
- Aug 11th: Field Trip: Utica, IL
- Aug 25th: Field Trip: Upper Michigan
- Sept 8th: Meeting: Monroe Library – Show & Tell
- Sept 22nd: Field Trip: Cedar Rapids, IA Area
- Oct 13th: Meeting: Trocke's Farm – Lapidary Day
- Oct 27th: Field Trip: Cedarburg, WI and Lake Michigan
- Nov 10th: Meeting: Monroe Library – Soap Stone Carving
- Dec 8th: Meeting: Monroe, WI – Annual Christmas Party

Note: There are no field trips in November & December due to the Holidays.

The February Meeting will be held at the Monroe Public Library at 10:00 in the meeting room on the second floor.

The program is going to be a sale & swap day. Bring your surplus pebbles that you would like to sell or trade and be ready for some fun bartering.

It will be almost like we're in Tucson—only colder and in a library and smaller, but what can you do??

Hopefully everyone will be able to go home with some new treasures! Please



have your items priced before hand so that there is no confusion! Snacks will be provided by Jack & Kim Hoxie. Hope to see you there!

Meeting Minutes

January 14, 2012

This month's meeting started out with a Video produced by Nova entitled The Last Extinction. It talked about several theories as to what caused the extinction of the Ice Age Mammals.

The meeting was called to order by President Jordan Marche.

Cathy Romeis made a motion to accept the December meeting minutes as written. Jack Hoxie seconded the motion. Minutes were approved and accepted.

Next up was the treasurer's report. Although Daisy Peterson is the treasurer, Donna Reese (last term treasurer) gave the report. She informed us that the club's finances are in order and we are up to date. She also reported that the money raised at the club auction was used to update and repair the club's lapidary equipment.

The first door prize was won by Mike Riesch. It was a very nice piece of green fluorite.

Announcements and reminders were next. The club calendars were handed out to everyone that had placed an order. Daisy asked for feedback on the calendars, good or bad. She also showed us a smaller version that was only about \$5.00. Anyone interested in a calendar should contact Daisy as soon as possible. Mike Riesch said he is interested in sponsoring another field trip to Door County. He has found some new collecting spots and would like to share them with the group. Teri Marche passed around a box of quartz points for anyone interested. This month's club trip is to the Burpee Museum of Natural History in Rockford IL on January 28. They have a traveling exhibit called Ice Age Mammals. Anyone interested can go at their leisure as we have no set time.

The only old business was a brief discussion about the term length of the treasurer. It had been brought up at an earlier meeting that it might be beneficial to have the treasurer's term be longer than 2 years. Daisy gave us an update and some information about the idea and thought we would be better off to limit the term to two or three years as we do now. Dan Trocke asked about our not profit status. Donna explained the club is a not for profit organization not a non-profit. It is not worth the cost and time investment to be a non-profit organization.

The second door prize was a very nice trilobite, won by Erin Trocke.

New business started out with a discussion about the club mineral calendar. Several ideas were talked about to possibly sell the calendars in the future. We might be able to offer them from our website, at the spring rock show and it may even be possible to have the Midwest Federation offer them through their website as a link. Donna made a motion to not sell the calendars at the show this year because of time restraints and table the idea until next year. Jack Hoxie seconded the motion. Motion was voted on and passed. Teri Marche suggested we gather photos throughout the year and start working on next year's calendar early this fall. If the decision is made to go forward with the calendar for next year, someone will have to spearhead the project

and likely put together a committee. Ken Schweitzer reports, the club website is up and running. (badgerrockclub.org) Teri asked that the website be updated with this year's show information. There was some concern that our web domain will expire again if the fees are not paid. Donna and Ken will work together to address this issue. Donna made a motion for the club to donate \$100 to the Monroe library again this year to show our appreciation for the use of the facility. The only stipulation is the money is to be used for the public library only. Daisy seconded the motion. Motion voted on and passed. The annual planning meeting will be held at the Marche's home on 01/21/2012. Everyone is welcome to attend. Club field trips and other events will be discussed. The club was contacted by a group asking us to include some information in our newsletter about a 3D mineral project they are working on. They were also looking for donations to fund the project. After a brief discussion, a decision was made to take no action on this issue.

The last item on the agenda was show business. Teri reports that one of the long time dealers will not be able to do the show this year because of a schedule conflict. She said she has 4 other dealers interested in taking the spot, so it will be no problem to fill. She will have a sign-up sheet at the next meeting for volunteers to help with the show. The Monroe homemakers will be doing the food again this year. Teri had the small half poster available at this month's meeting and should have the full posters ready next month. She is still working on ideas for the layout of the crystal mystery show theme. Several ideas were discussed but still need to be worked out. A drawing was done for spots on the members' sale table. She will try to scan the layout of the table and email it out to those people participating. Sale slips will be the same as last year. Dan will try to send out a copy to those people who need them. Dan and Laurie Trocke collected donations for the fishpond bags that will be filled during the March meeting at their house. Dan made a motion to use the extra gold brick game prize as a door prize for the March meeting to entice more people to show up for the fishpond bag stuffing. Marv Hanner seconded the motion. The motion approved and passed. Teri will try to contact Dennis and Mary Westby to see if they are planning to help with the spinner and fishpond game this year.

The last door prize was won by Cathy Romeis. It was a very nice piece is Sphalerite and Calcite crystal.

Thank you to Neal and Linda Trickel for this month's treats. The Hoxie family volunteered for the February meeting.

Teri Marche made a motion to adjourn the meeting. Marv Hanner seconded the motion. Meeting was adjourned.

Submitted by

Ralph Burgener

What's Rockin'

January brought out another fine assortment of specimens for the meeting display. It may have been cold outside, but the What's Rockin table was hot.

Marvin Hanner brought some Spodumene from Pakistan, Johachidolite-Hackmanite from Burma and Alabandit-Pronstite from Peru. Dave Reese brought a Picture puzzle of Agates that was a christmas present and a Brazilian agate that was made into a shooter marble. Erich Hessner had some great pieces of native silver from various U.P. copper mines. David Cress brought some Lapis lazuli with Pyrite from China. Teri Marche' brought Fluorite on Quartz from India and Quartz from Arkansas.

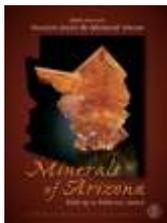
Erin Trocke brought a Lake Superior Agate with a mystery green mineral inclusion that she found on a dig at the Dodgeville Elementary school playground and an elephant poop paper book. Dan Trocke brought a whole box full of specimens starting with Dino Dung, Petrified coral from Florida, Petosky stone from Michigan, Phantom Quartz, Petrified Pine Cone from Morocco, Wire Silver from the U.P., Chalcopyrite from Mexico, Calcite on Fluorite from Cave-In-Rock area, and a Native Silver and Copper Nugget from the U.P.

Submitted by the Green's

Upcoming Mineral Related Events

February 9–12—Tucson, AZ. 58th Tucson Gem and Mineral Show™: Minerals of Arizona, Tucson Convention Ctr. Info.—[Info.—www.tgms.org](http://www.tgms.org)

Tucson Gem, Mineral & Fossil Showcase
Jan. 27 - Feb. 12, 2012
Tucson, Arizona



For two weeks every winter, the rock and gem world meets in Tucson as it becomes a bustling, international marketplace of buyers and sellers at the Tucson Gem, Mineral & Fossil Showcase. The "Gem Show" is much more than a single event at one location. Rather, there are thousands of participants and attendees at nearly 40 sites around town that take place at the same time - in giant white tents, at hotels and resorts and at exhibit halls.

Keep in mind, however, that some shows are only open to wholesale buyers and require credentials in order to enter. Registration for these shows can usually be done before or at the shows, but needs to be done separately with each show promoter.

Most of the gem and mineral shows around Tucson are free and hours vary.

February 10-12—KIRKWOOD (ST. LOUIS), MISSOURI: Annual show; Cabin Fever Productions Inc.; Kirkwood Community Center; 111 S. Geyer; Fri. 4-9, Sat. 10-6, Sun. 10-4; adults \$3, seniors and students \$2, children free; rocks, minerals, fossils, jewelry, gems, upscale jewelry; contact Bruce Vick, (618) 973-7222; e-mail: cabinfeverprod@aol.com; Web site: www.cabinfeverprod.com

February 11-12—MERRITT ISLAND, FLORIDA: Annual show; Central Brevard Rock & Gem Club; Kiwanis Island Park; 950 Kiwanis Park Rd.; Sat. 10-5, Sun. 10-5; adults \$3, children (12 and under) free with adult; rough and cut gems, minerals, fine jewelry, equipment, lapidary supplies, books, beads, exhibits, demonstrations; contact Erleen Estes, (321) 632-3201

February 26-27; Roseville, MN: Anoka County Gem & Mineral Club, Har Mar Mall, 2100 Snelling, Sat 10:00-6:00, Sun 10:00-5:00, Contact Martha Miss, 8445 Grange Blvd, Cottage Grove, MN, 55016, rockbiz8@cs.com

Paleofest 2012 at Burpee Museum Sat., March 3 & Sun., March 4; 10 a.m. – 5 p.m. each day

Once again, the Burpee Museum in Rockford has assembled a fine lineup of professional speakers for its annual Paleofest, set for the first weekend in March. Highlights include a children's lecture on dinosaurs by Dr. Scott Sampson, at 1 p.m. on Sunday, and a banquet talk at 7:30 p.m. on Saturday night by the same speaker, on the topic, "Dinosaurs of the Lost Continent."

Two family workshops each will be given on Saturday and Sunday, at 11:30 a.m. and 3:30 p.m. Topics (in order) are Rise of Modern Amphibians; Jaws and Claws; Mammoths and Mastodons: The Real Story; and Horns and Frills.

In addition, four adult-level talks are given each day, at 10:30 a.m., 12 noon, 2 p.m., and 3:30 p.m. Speakers and topics are too numerous to list individually here, but cover a wide range of geoscience subjects. Admission to the Museum is required, and a one- or two-day pass for the talks is available. Talks may also be attended on an individual basis.

The Museum is located at 737 North Main Street, Rockford. Call 815-965-3433 or visit www.burpee.org for more information.

UW Madison Physics Fair & The Wonder of Physics!

The 29th annual presentation of The Wonders of Physics will be held in 2103 Chamberlin Hall (1150 University Avenue) at the following dates and times:

Saturday, February 11 at 1:00, 4:00
& 7:00 pm
Sunday, February 12 at 1:00, 4:00
Saturday, February 18 at 1:00, 4:00
& 7:00 pm
Sunday, February 19 at 1:00, 4:00

Free tickets are now available for all shows and can be obtained by:

<http://sprott.physics.wisc.edu/tickets.htm> (preferred)

Please also join us for the 5th annual Physics Fair, featuring hands-on activities, demonstrations, and lab tours, which will be held on Saturday, February 18th from 11 am to 4 pm. For more information about the Physics Fair, please visit: <http://uw.physics.wisc.edu/~wonders/PhysicsFair.html>. Tickets are NOT required to attend the Physics Fair.

Upcoming Local Events for February

- **1 - 5 Lake Geneva - The 17th Annual Winterfest and U.S. National Snow .** Music, magic, refreshments and the crowning of the Best Snow Sculpture in America are featured, headquartered at the beautiful Riviera building at the Lakefront. Downtown Lake Geneva. For more information call (800) 345-1020.
- **4 Blue Mounds - Candlelight Ski / Hike / Snowshoe.** Ski on one and two mile lit loops. Separate lit trail for hikers, snowshoers, and leashed pets. Blue Mound State Park, For more information call (608) 437-5711
- **4 - 5 Madison - Orchid Quest.** The Orchid Growers Guild presents the Midwest's largest event with award winning plants, exhibits, speakers, vendors of orchid plants, raffle and silent auction. Fun for all. Alliant Energy Center Exhibition Hall. For more information call (608) 231-3163.
- **4 Madison - Terrace Town Going Green.** Free architectural fun and learning for the whole family. Monona Terrace Community and Convention Center For more information call (608) 261-4000.
- **4 Milwaukee - Milwaukee Zoo Family Free Days.** Bring a pack to the Zoo for free. Free admission for all, parking fee does apply. Milwaukee County Zoo, 10001 W Bluemound Rd. Event starts at 9:30AM and ends at 4:30PM. For more information call (414) 256-5412
- **4 Wisconsin Dells - Winter Carnival at Christmas Mountain.** Winter Carnival at Christmas Mountain Village in Wisconsin Dells. Dog sled racing, woodsplitting, and turkey bowling are among the many events scheduled. S944 Christmas Mountain Rd., Wisconsin Dells, WI 53965
- **17 - 19 Madison - Zor Shrine Circus.** The Annual Zor Shrine Circus is always a big hit with the entire family! There are animals, trapeze artists, and of course clowns galore to entertain and thrill the audience. Alliant Energy Center, 1919 Alliant Energy Center Way. For more information call (608) 267-3976.
- **18 Drummond - Barstool Races & Chili Feed.** Participants decorate their barstool-on-skis with some of the zaniest things you'll ever see, and then they set off in head-to-head competition down the man-made ski hill for thrills, chills and lots of spills! Great food including hot homemade chili, cold beer and fun! Funds raised go towards snowmobile grooming in the Drummond area. Black Bear Inn. For more information call (715) 739-6262.
- **18 Madison - Polar Plunge.** The Polar Plunge is a unique opportunity for individuals, organizations, and businesses to support local Special Olympics athletes by jumping or slowly crawling into the frigid and icy waters of Wisconsin. Olin Turville Park. For more information call (608) 221-2900.
- **18 - 19 Madison - Mad City Model Railroad Show and Sale.** 45th Annual! More than 90,000 sq ft of model train layouts in Z, N, HO, S, O and G scales, classic toy trains, exhibits & videos. Admission charged. Alliant Energy Center, 1919 Event starts at 9:00AM and ends at 5:00PM. (608) 267-3976.
- **18 - 19 Madison - Madison Winter Festival - Capitol Square Sprints.** Madison's Capitol Square is transformed into a winter wonderland with ice and snow sculptures, premiere cross-country skiing, snowboarding and snowshoeing venues during this weekend-long event. Family oriented activities, special events at the museums, public open skiing and music. Wisconsin State Capitol Building. For more information call (608) 385-8864
- **24 - 26 Madison - Madison Fishing Expo.** This show is the largest in the Midwest. Fri 4-9PM, Sat 9AM-7PM, Sun 9AM-5PM. Alliant Energy Center. (608) 267-3976
- **Feb 24 - Mar 24 Monroe - Badger Conference Art Exhibit.** Participating high schools in the 2012 exhibit are Baraboo, Monroe, Mount Horeb, Oregon, Portage, Reedsburg, Sauk Prairie, Stoughton, Verona, and Waunakee. Tuesday-Saturday 10AM-5PM. Monroe Arts Center, 1315 11th Street. For more information call (608) 325-5700
- **25 Medford - Perkinstown Outhouse Races.** The "Race of Thrones!" Teams of four pushers and one squatter make their way around the snowy race course. Fun for everyone with Kids' Races new in 2010. Don't miss Otis' Famous Pig Roast and Rat Roulette! Registration noon; races begin 1PM. Perkinstown Winter Sports Area. For more information call (715) 427-1002
- **25 Prairie du Chien - Bald Eagle Appreciation Day.** Live bald eagle programs in the morning and afternoon, eagle and raptor exhibits, displays, birding experts on hand, activities for children, and short field trips to bald eagle watching locations. Prairie du Chien Chamber of Commerce Building, 211 S Main. Event starts at 9:00AM and ends at 3:00PM. For more information call (800) 732-1673.
- **29 Janesville - Leap Year Family Fun Day.** With an extra day to spend with family and friends every four years, there is no better place to celebrate it than at Rotary Botanical Gardens. Enjoy special activities for the young and young at heart! From bunnies to frogs to kangaroos, it will be a hoppin' and leapin' good time! Rotary Botanical Gardens, 1455 Palmer Drive. For more information call (608) 752-3885.

Show Chair's Report

In about one and one-half months we will be setting up for our forty-second annual show.

What is ready:

Dealers: all ten are under contract with others circling for a chance to get in, should the opportunity arise.

Speakers: all four are lined up; many thanks to Jordan!

Demonstrators: two of the four are set, with leads on others.

Kitchen: under contract and ready to go.

Club Sales Table: is fully stocked

Advertising: being placed on every free site possible. Short posters have been printed and distributed. Long posters will be available at the February meeting.

Show Theme: Quest for the Crystal Badger has been conceptualized and is under development.

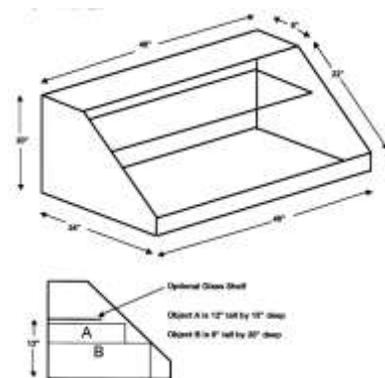
Fish Pond: material being collected, chairs getting organized for March meeting

What is needed:

Fish Pond Material: we will need much, much more! Some has been collected so far, but it is nowhere near enough to fill the roughly 1000 bags we usually need. Anything you have that is either small enough, or can be broken down small enough, is welcome. Fossils, minerals, agates, tumbled stones, anything that will fit the bags and pique a child's interest is fair game.

Club Display Cases: sign-up sheets will be available at the February meeting. As you may know we have two case sizes, 8 large cases and 12 small ones. You may sign up for more than one if you wish. We definitely need to have all of them filled. If you have an idea of what you will be displaying, that will help with creating the mystery show theme. If you cannot be at the meeting, you may sign up by email at tmarche@usnetizen.com indicating case size and display theme if possible. Remember that all displays must be well organized and fully labeled.

Sign-up Sheets for Work: will be ready at the next two meetings. If everyone does a little part, nobody has to haul a huge load, so do not be afraid to make a commitment!



Time will be getting short, and I am prepared to get nervous again, but in the meantime, I will be in Tucson, with Mike and Ruth Riesch, and Dave Zimmerman and Jane Lagacé. I will, unfortunately, miss the meeting (how to be in two places at once?) but I will have the posters and sign-up sheets sent along. When I get back, I will be in full show mode!

Teri Marché

Q. When is a Rhomb Not a Rhomb? A. When It's a Cuboid

article and photo by Jordan Marché

During the first BLGS club field trip to Door County, Wisconsin in September 2010, along with collecting fine specimens of Silurian-age fossilized corals from the limestone fencerows, I came across a small pocket of honey-colored crystals that display a cubic shape (Fig. 1). The largest single crystal in the sample shown is about 4 mm on a side. I was therefore surprised when trip leader Mike Riesch of Earthaven Museum promptly identified them as being calcite crystals.



Fig. 1. "Cubic" calcite crystals

Now, most of us are familiar with the other, more common forms of calcite crystals, namely rhombohedrons and scalenohedrons (i.e., "dog-tooth calcite"). Calcite belongs to the rhombohedral division of the hexagonal crystal system (e.g., Pough, 1976, pp. 145-146). According to Mike, these were the first calcite crystals of any kind that he had seen emerge from the fencerows. Because of the open spaces surrounding the crystals, they did not appear to be pseudomorphs or replacements after a pre-existing mineral; something rather difficult to imagine as having occurred within this formation. But *cubic* calcite crystals?

I was unable to find any recent published sources that described cubic occurrences of calcite, and thus sought other help. Sure enough, if one goes far enough back into the mineralogical literature, references to near-cubic (or pseudocubic) calcite crystals can be found.

Apparently, the first mineralogist to recognize this 'cubic' form of calcite was Jens Esmark, who assigned it the name Brunnerite (Esmark, 1798) and whose specimens were collected in the Faroes. This name was later employed by mineralogist René Just Haüy in a work published in 1822. In the early twentieth century, Yale University mineralogist Edward Salisbury Dana figured and briefly described this form of calcite as "cuboid crystals" in the sixth edition of James Dwight Dana's *System of Mineralogy* (Dana, 1904, pp. 265-266 and Fig. 4, p. 263). In turn, the second volume of Victor Goldschmidt's *Atlas der Krystallformen* (Goldschmidt, 1913) depicts the same crystal structure and orientation (Fig. 2349, p. 143) as Dana's figure (Fig. 2). Yet, neither reference appears to explicitly declare whether the angles of the crystal sides are truly, or only approximately, 90 degrees, or whether all faces have the same length. It seems best, therefore, to refer to these crystals as "cuboidal" or "pseudocubic." I have donated the largest specimen of these crystals to Earthaven Museum.

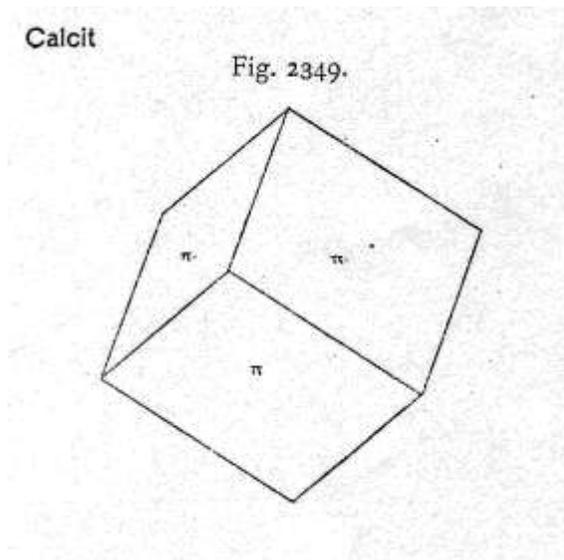


Fig. 2. Cuboidal calcite, from Goldschmidt (1913).

I wish to express my thanks to Mike Riesch for organizing this collecting trip, and especially to Bob Jones, senior consulting editor of *Rock & Gem*, for furnishing the references to Dana's and Goldschmidt's volumes, copies of which I located at the library of the UW-Madison Geology Department.

References

Dana, Edward Salisbury (1904). *The System of Mineralogy of James Dwight Dana*. Descriptive Mineralogy, 6th ed. New York: John Wiley & Sons.

Esmark, Jens (1798). *Kurze Beschreibung einer mineralogischen Reise durch Ungarn, Siebenbürgen und das Bannal*. Freyburg: Craz.

Goldschmidt, Victor (1913). *Atlas der Krystallformen*. Tafeln [Plates]. Band II. Heidelberg: Carl Winters Universitätsbuchhandlung.

Pough, Frederick H. (1976). *A Field Guide to Rocks and Minerals*, 4th ed. Boston: Houghton Mifflin.

'Slam-dunk' proof of water on Mars

Posted By [Anne Ju-Cornell](#) On December 14, 2011 @ 8:21 pm In [Science & Technology](#)



The Mars exploration rover Opportunity discovered a vein of the water-deposited mineral gypsum. "It's not uncommon on Earth," says Steve Squyres, "but on Mars it's the kind of thing that makes geologists jump out of their chairs." (Credit: NASA/JPL-Caltech/Cornell/ASU)

CORNELL (US) — The discovery of a bright vein of gypsum in ancient rock proves that water once flowed underground on Mars, researchers say.

The vein, examined by NASA's Mars exploration rover Opportunity, is about 16 to 20 inches long and the width of a human thumb, and protrudes slightly higher than the bedrock on either side of it. The vein and others like it are within an apron surrounding a segment of the rim of Endeavour Crater.

None like it were seen in the 20 miles (33 kilometers) of crater-pocked plains that Opportunity explored for 90 months before it reached Endeavour, nor in the higher ground of the rim.

"This tells a slam-dunk story that water flowed through underground fractures in the rock," says Steve Squyres, professor of astronomy at [Cornell University](#)^[1] and principal scientific investigator for Opportunity.

"This stuff is a fairly pure chemical deposit that formed in place right where we see it. That can't be said for other gypsum seen on Mars or for other water-related minerals Opportunity has found. It's not uncommon on Earth, but on Mars, it's the kind of thing that makes geologists jump out of their chairs."

Last month, researchers used the microscopic imager and alpha particle X-ray spectrometer on the rover's arm and multiple filters of the panoramic camera on the rover's mast to examine the vein, which is informally named "Homestake."



The spectrometer identified plentiful calcium and sulfur, in a ratio pointing to relatively pure calcium sulfate.

Calcium sulfate can exist in many forms, varying by how much water is bound into the mineral's crystalline structure. The multifilter data from the camera suggest gypsum, a hydrated calcium sulfate. On Earth, gypsum is used for making drywall and plaster of Paris.

The findings were presented Dec. 7 at the [American Geophysical Union's conference](#) ^[2] in San Francisco.

Observations from orbit have detected gypsum on Mars previously. A dune field of windblown gypsum on far northern Mars resembles the glistening gypsum dunes in White Sands National Monument in New Mexico.

The Homestake deposit, whether gypsum or another form of calcium sulfate, likely formed from water dissolving calcium out of volcanic rocks. The minerals that combined with the sulfur either leached from the rocks or stemmed from volcanic gas. The resulting calcium sulfate was evidently deposited into an underground fracture that later became exposed at the surface.

Throughout Opportunity's long traverse across Mars' Meridiani plain, the rover has driven over bedrock composed of magnesium, iron and calcium sulfate minerals that also indicate a wet environment billions of years ago.

The highly concentrated calcium sulfate at Homestake could have been produced in conditions more neutral than the harshly acidic conditions indicated by the other sulfate deposits observed by Opportunity.

Opportunity and its rover twin, Spirit, completed their three-month prime missions on Mars in April 2004. Spirit stopped communicating in 2010.



NASA launched the next-generation Mars rover, the car-sized Curiosity, Nov. 26. It is **slated for arrival at the planet's Gale Crater** this coming August.

NASA's Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Mars Exploration Rover Project for the NASA Science Mission Directorate in Washington.

Article printed from Futurity.org: <http://www.futurity.org>

URL to article: <http://www.futurity.org/science-technology/%e2%80%98slam-dunk%e2%80%99-proof-of-water-on-mars/>

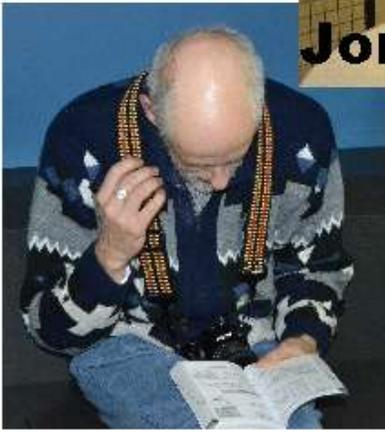
URLs in this post:

[1] Cornell University: <http://www.news.cornell.edu/stories/Dec11/roverVein.html>

[2] American Geophysical Union's conference: <http://sites.agu.org/fallmeeting/>

[3] www.news.cornell.edu: <http://www.news.cornell.edu/>

Burpee Museum



Ice Age Mammals



Badger Lapidary & Geological Society, Inc.

Laurie Trocke, Editor

4771 CTH II

Highland, WI 53543



**WHO? WHAT?
WHERE? WHEN?**

Become a rock and mineral sleuth and try your hand at solving the geological mystery by tracing the series of clues hidden throughout the show. Each clue builds a piece of the picture as you visit the people and places in the hall to win a prize.

42nd Annual Monroe

Rock, Gem, & Mineral Show

March 31 & April 1, 2012

9:00 am to 5:00 pm – Saturday and Sunday

Monroe High School, 1600 26th St. Monroe, WI (off Route 69 south)

Admission: Free Will Donation – Free Parking



***THIS YEAR'S THEME – THE
AGATE N' CRYSTAL MYSTERY***



**Ten Dealers in Minerals, Fossils, Gems, and Jewelry
Speakers, Educational Exhibits, Demonstrations,
Hourly Door Prizes, Great Food
Wonderful Pieces from Around the World!**

For the Kids

**Fish Pond, Spinner Game, Scavenger Hunt, Wandering "Rock Wizard"
Hands-on Activity – Fossil Casting.**

For More Information, Contact Teri Marché, 608.835.2653
Or email tmarche@usnetizen.com Web Site: www.badgerrockclub.org

Presented by the Badger Lapidary and Geological Society

A Non-profit organization dedicated to promotion of earth science study for children, adults, and families.
MEMBER OF THE AMERICAN FEDERATION AND MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES