



# Rocky Reader

The Monthly Newsletter Of The  
**Toledo Gem And Rockhound Club**

Volume 47 – Issue 3

March 2010

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## PRESIDENT'S MESSAGE

We are moving right along with our plans for this year. We have a new Gemcrafter's group, Junior's is active with a core group of steady participants, the Show Committee is getting organized, MSHA training is in place. I couldn't ask for more... but of course, I will!

Many of us have gone on rock collecting trips in various parts of the country, some relatively local – within a state or two? Some of us may have friends or other connections with local quarries. Harold, as our field trip chairman, could use your help. His job does not allow the freedom to make a lot of phone calls during the business day.

What we need is for members who have information, locations, contacts to make an initial contact and/or pass the information on to Harold and myself, so that we can explore the possibilities of new collecting sites. We can even work to arrange multi-day trips like those that Joel Vicary has done to Michigan, Kentucky or Ontario. Let's take advantage of the resources we have to develop opportunities for the club.

Because of the fact that we are hosting the Midwest Federation in 2011, we especially want to develop a few trips locally, so that we can try to organize visits during and just prior to the Convention. Typically, the host club arranges some trips for the out of town delegates. So put your thinking caps on and let's see what we can come up with!

Thank you! Jerri A. Heer

## SCHOLARSHIP DONATION IN HONOR OF PEGGY JONES

Peggy Jones was a long time, key member of the Toledo Gem and Rockhound Club for many years. A few dedicated members have taken the opportunity to collect separate donations to be given to our University of Toledo Scholarship fund in Peggy's name. If you wish to contribute to this bequest, please see the clubs Treasurer, Steve Shimatzki. He will collect the funds and at the end of March, issue a check and send a letter to Peggy's family notifying them of this gift in her name.



## TG&RC MEETING MINUTES – February 17, 2010

The program was the Metalcrafters and Faceteers II Silent Auction from 7-7:30 p.m. After members picked up their items, the meeting was called to order at 7:46 p.m. President Jerri Heer led the club in reciting the Pledge of Allegiance.

**Secretary's Report:** Tom Marok moved to accept the minutes as printed and Elie Ghamine seconded. The motion was approved.

**Treasurer's Report:** Steve Shimatzki said the state of the club's treasury is healthy. Jim Leslie moved to accept the Treasurer's report as read. Ruth Jacobs seconded. The motion carried.

**Old Business:** Sherry Haas sent a letter that she had completed the club's audit of the Treasurer's books. She suggested that the Treasurer do a monthly reconciliation of the bank balance and ledger balance with a list of outstanding amounts.

**New Business:** Jerri and Steve presented the yearly budget for approval. Steve Shimatzki pointed out the items of note. Tom Marok moved to approve the budget as printed. John Hull seconded and the motion carried.

**TBG:** Chet King said the next major event was the plant sale and the open House in May. He noted that TBG no longer has a full-time Director and a member of the Board will be running the Gardens as a part-time director.

**Gemcrafters:** Elie Ghanime said he and Jeff Wheeler have been fixing equipment and making some changes. The water system has been improved. There is a new 18-inch saw and a new 6-inch diamond wheel. These should be up and running in a week or so. The group is trying to get everyone through training on the equipment. They are also working on cleaning the area, converting videos to DVDs and cleaning out cupboards. The new afternoon Gemcrafters group meets on Thursday afternoons from noon to 4 p.m. Members who have been approved to use the machines are listed on a posted sheet. New members must finish a cab before they are approved to work on the equipment.

**Metalcrafters:** The report will be in the Rocky Reader.

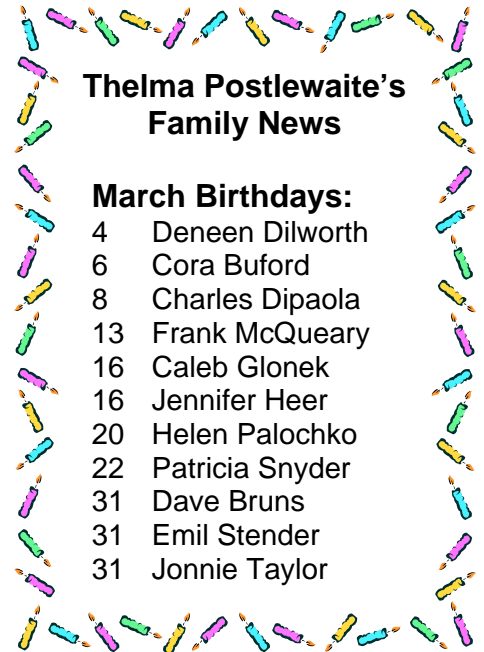
**Beaders:** Nancy Grove said the group held their first meeting February 15<sup>th</sup>. The next meeting in March will have a 6 p.m. start time instead of 6:30.

**Extreme Beaders:** Shirley Stieb said the next meeting would be the first Tuesday in March from 2-6 p.m.

**Faceteers:** Don Ault said the February meeting was cancelled due to snow and the next meeting will be the second Wednesday in March. Faceteers II is meeting the 1<sup>st</sup> and 3<sup>rd</sup> Tuesdays of the month at 6:30 p.m. Elie announced there would be another faceting class in April. The class is limited to 6 people and the date will be in the Rocky Reader.

**Juniors:** Jerri said there are about 15 juniors and they meet Sunday afternoons from noon-2 p.m. The January meeting had 8 attendees and they are training on the lapidary equipment. This will continue during the February meeting. The next meeting is February 28<sup>th</sup>.

**Rocky Reader:** Steve Shimatzki said the deadline for copy is Monday, February 22<sup>nd</sup>. Members and group moderators need to get written copy to Suzanne by that time.



**Membership:** Tonia Wallace said there were 48 members signed in with 3 new members and 1 junior present.

**Sunshine:** Lucille was not present but Chet announced the death of former member and Rocky Reader editor Bon Duritsky.

**Field Trips:** Harold Burleson said the next MSHA class is scheduled for Saturday, March 6. There is room for 20 people and there are still some vacancies. Joel Vicary has a trip to Kentucky April 6<sup>th</sup>. Jerri said that Harold needs help contacting quarry owners for permission to dig as he cannot make phone calls from work. Harold also said field trips do not have to be quarries, members can go anywhere someone wants to go. Members should get suggestions to Harold for possible trips.

**Show:** Jerri said the show committee met briefly before the meeting. There is one chair position still open. The next show committee meeting will be April 21<sup>st</sup> prior to the general meeting.

**Open House:** The Open House weekend is May 15-16. Setup will be Friday, May 14<sup>th</sup>. Carla Burleson said anyone wanting a table must contact her at the club meeting or by phone. Members should not email her about the Open House. If members cancel, they must give her a weeks notice.

**Further Business:** Tom Marok said he would like to start a fossil hunters group. He will put a notice in the Rocky Reader.

There being no further business the meeting adjourned at 8:30 p.m.

Respectfully submitted, Lyn Kalinoski, Secretary

### **THANK YOU!**

A **BIG** thank you to everyone who brought and purchased materials from the Metalcrafter auction. We are very grateful for your generosity. Recently, we upgraded some of the materials used for sintering PMC clay. Upgrades, new purchases and invited instructors are all possible because of the funds from the auction. I will be talking with the members of the group to see what classes/equipment we would like for next year. If you have opinions on this subject, please contact me.

Deb Hoffmaster, Metalcraft Moderator

### **CONDOLENCES**

Former member Bon Duritsky passed away Tuesday, Feb. 16, 2010 from complications of Parkinson's disease. He was 75. Bon enjoyed rockhounding and created beautiful jewelry. He also enjoyed working with stained glass, wood, clay and leather. He was the editor of our Rocky Reader for many years and later edited Rock Trails for the Stateline Gem and Mineral Society. Visitation will be held at Ansberg-West Mortuary, 3000 Sylvania Ave. from 2-8 PM on Thursday with the funeral on Friday. We send our condolences to Joan, his wife, Bonnie, his daughter and the rest of his family.

Lucille Burgy, Sunshine

### **BEADERS**

On March 15, 2010, we will begin meeting at 6:00 (instead of 6:30) pm in the Craft Center. If you are not able to come this early, don't worry, just come when you can. In March we will finish up on the Two Drop peyote bracelet. This project was a warm up for the Bargello necklace that we will do next. In May we will do a cable bracelet using herringbone stitch which will lead us to our next project, the "berry delicious" bracelet. Patterns will be provided for all projects. Needles, thread and a limited amount of beads will be available. If you have any questions, you can call or contact me by e-mail. Looking forward to beading with you.

Nancy Grove, Moderator

## GEMCRAFTERS

All new members or existing members that need to work in the Gem-craft center to cut and polish cabochon **for the first time**, please call or email Elie or Chet to schedule a meeting slot for your training to complete your first cabochon AND PLEASE LEAVE YOUR FULL NAME AND CONTACT INFORMATION.

## METALCRAFTERS

The metalcrafters will meet March 7, 1:30-3:30, 11, 6:30-8:30, 21, 1:30-3:30 and 25, 6:30-8:30. PLEASE NOTE: Please check your e-mail one half hour prior to the meeting to see if I have posted a cancellation. If you are not on my e-mail list, or you are not sure, send me note to dhoffmaster1@verizon.net.

If you **HAVE NEVER ATTENDED**, please call or e-mail Debra Hoffmaster (see directory) to schedule a three meeting slot to complete your instructional pendant. When you do so, **PLEASE LEAVE YOUR FULL NAME AND CONTACT INFORMATION.**

Debby Hoffmaster, moderator

## JUNIORS

The next Junior's meeting is Sunday, February 28th, from Noon to 2 PM. We will continue to work on the lapidary equipment. Every Junior will have the opportunity to cut and polish at least one cab. Several Club members will be on hand to assist. All registered Junior members are welcome to participate, others may observe. For more information, call or email Jerri Heer: 419-344-9999 or [jheerx6@aol.com](mailto:jheerx6@aol.com).

Jerri Heer, Junior Moderator

## 2010 SHOW

The first Show committee meeting was held before the February General Meeting. We still need committee help for the Raffle and Hospitality. Assistance in any area is welcome. Committee Chairs are as follows:

Exhibits: Nan Grove  
Advertising: Mike Mayers  
Silent Auction: Harold Burleson  
Kid's Kits: Ed Reynolds  
Kids Games: Tom and Pam Marok  
Hospitality: Carla Burleson - **Needs help**  
Dealers/Demonstrators: Jerri Heer  
Raffle: **Need a Chair and Assistant**  
Show Co-Chairs: Suzanne Shimatzki and Jerri Heer  
**Next Show committee meeting April 21, 6:30 PM - before general Meeting.**

## TBG NEWS

*excerpt from Change of Hands news article*

Robert Regan has been named part-time interim director of Toledo Botanical Gardens, according to Mimi Creutz, president of the board. Regan, a former TBG board member, is the business and operations manager at Our Lady of Lourdes Catholic Church and School. He previously was the manager of strategic planning at Teledyne CAE and was controller of the Prestolite Battery Division at Eltra Corp.

Janet Schroeder, the garden's director for the last five years, resigned last week. She said she wanted to pursue other opportunities.



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## ROCKY READER

Submissions for the April Rocky Reader **must be received by noon on Monday, March 22<sup>nd</sup>**. Many groups are not sending regular notices. From now on, if I do not receive a submission from your group or event, I will assume you have nothing to report. Submissions must be in writing and written as you wish it to be published.

## CLASSES

The following schedule is a listing of upcoming classes. To enroll, please send all fees to the instructor. Fees must be received, at the latest, two weeks prior to the class, however, many classes fill up well in advance of this deadline.

**March 13. 10AM. Copper trinket box.** Instructor Debra Hoffmaster. Fee \$40. Five spaces left. Students in this class will construct an oval copper trinket box with a cabochon top. To be eligible for this class, students must have completed their introductory pendant.

**April 3 & 4. Saturday 9AM to 5PM. Sunday 10AM to 4PM.** Faceting Class. Fee \$40 includes class material and one stone to cut "clear quartz". Spaces are limited to six (6) peoples using "Chet" faceting machines and up to four (4) more using their own machine. Please email Elie Ghanime at eghanime@bex.net to register (First come first serve). If you need to rent, borrow or buy a new or used machine, please contact Ed Reynolds at 419-340-8801 or email him at ereynolds4@aol.com

**April 10. 10AM. Enameling on copper.** Instructor Harriet Nearing. Fee \$30. FULL. Students in this class will learn the basics of enameling by producing a small enameled copper shape that may be set into jewelry. Students will be provided with copper and enamels.

**April 24. 9 AM to 4 PM.** PMC Work Day. \$10 Studio Fee. This is a workshop open to members who have independent working skills with PMC. There is no formal instruction and there is a limit on the number of members who can work. If interested, contact Kathy Petersen or Tonia Wallace, for additional information and to register.

**May 15. 10 AM.** Chainmaille Class. Instructor Kathy Petersen. Fee \$87 payable to Kathy 4 weeks prior to class. The project is a Japanese 8 in 2 link sterling silver bracelet, with designer clasp.

## COMING EVENTS

### from Chetty King's Flyer Table

**MARCH 5-7:** Richmond, IN. Eastern Indiana Gem & Geological Society's Annual Show; Wayne Co. Fairgrounds, 861 N. Salisbury Rd.; Fri. 9-6, Sat. 10-6, Sun. 11-4; CONTACT: John LaMont, 14158 State Rte. 1, Brookville, IN 47012 (765) 647-4894, [midwestchar@peoplepc.com](mailto:midwestchar@peoplepc.com).

**MARCH 19-21:** Jackson, MI. Michigan Gem & Mineral Society's 48<sup>th</sup> Annual Gem & Rock Show. Jackson County Fairgrounds, 200 West Ganson St., Fri. 10-7, Sat. 10-7, Sun. 10-5. [www.mgmsrockclub.com](http://www.mgmsrockclub.com)

**MARCH 27:** 38th Annual Metro Rock Swap, hosted by The Midwest Mineralogical & Lapidary Society. Saturday, March 27, 2010, 10:00 AM - 5:00 PM. Location: Democratic Club of Taylor, 23400 Wick Road, Taylor, Michigan. Table Reservations & Info: 734-525-1684. Free Admission. Free Parking. Refreshments Available. \*\*\*Swap - Sell - Buy\*\*\*

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## NEW ELEMENT CONFIRMED COPERNICIUM

*excerpt from slashdot.org submitted by Steve Shimatzki*

Dust off your Periodic tables, you need to add a new element: Copernicium. The International Union of Pure and Applied Chemistry has confirmed Copernicium as element 112 on the periodic table of elements with the symbol Cn. "The naming of the new element will be the culmination of a long, fraught journey involving fierce competition, dashed hopes, clever detective work and even a brush with scientific misconduct. With a nucleus containing 112 protons 20 more than uranium, the heaviest of the naturally occurring elements it will be the weightiest atom whose existence has been confirmed so far. For more information on the controversy stirred up by element 112 go to <http://www.newscientist.com/article/mg20227134.400>



## NEW CARBON FORM HARDER THAN DIAMOND

*excerpt from MSNBC submitted by Steve Shimatzki*

Researchers were polishing a slice of the carbon-rich Haverro meteorite that fell to Earth in Finland in 1971. When they then studied the polished surface they discovered carbon-loaded spots that were raised well above the rest of the surface suggesting that these areas were harder than the diamonds used in the polishing paste. To read the complete article, go to: [http://www.msnbc.msn.com/id/35198934/ns/technology\\_and\\_sci ence-science/](http://www.msnbc.msn.com/id/35198934/ns/technology_and_sci ence-science/)

## SAFETY THOUGHTS

*by David Rich, from MWF NEWS 01/10*

The new year is here and what a wonderful time to make a few safety resolutions and safety improvements. One of your resolutions should be to **wear Safety Glasses**. Wearing safety glasses should be a part of the way you work. From blowing leaves to silver soldering, wearing safety glasses should be second nature. This little item in the tool box could save your eyesight. I personally have at least 10 pairs; they are everywhere. I have a pair with my weed whacker, at my lawn mower, and out in my barn tool box. I have the goggle type in the greenhouse where I have my fertilizer and orchard sprays. Of course, you will find them in my rock collecting bags. I have a pair in the tool repair kit in my truck. I must admit that some of the safety glasses are old and scratched up. Some are not the most fashionable, but when you need eye protection, a few scratches or outdated styles will still afford the protection you need. Now that your first New Year's resolution is made, you can be more likely to maintain good eyesight throughout 2010.

Take a good look at your work station. Go over and stand in front of your work area or hobby/craft area. Now promote yourself to Safety Inspector. Look at your electrical connections. Do you have a ground fault? Are your extension cords old or torn? Is your area cluttered up? Are your tools sharp and well maintained? What about your chemicals? Do you have them stored properly? Are the lids on and containers labeled correctly? Should these chemicals even be in the house or garage? This is a good time to **give yourself a critical safety inspection**.

I would like to hear from you about your safety inspection results. Send an e-mail to me at [birdman035@hotmail.com](mailto:birdman035@hotmail.com) and let me know what you did to improve your hobby/craft and/or work areas.

Be safe.

LAST MONTH'S SOLUTION: ZMinerals

Z	I	N	N	W	A	L	D	I	T	E		Z	I	G	
I	N	G	O	T		E	O	N		L	A	I	T	Y	
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# ***POPULAR MINERALOGY***

*Interesting mineralogy and earth science for the amateur mineralogist and serious collector - #24*

## Mineralogy of Eruptions

by Andrew A. Sicree

### Sticky or runny lava

Mauna Loa, on Hawaii, erupts and a river of crimson lava wells up and out of the caldera on the summit of the volcano. Flowing briskly and smoothly, the incandescent river pours down the side of the mountain and stretches toward the sea. The landscape is covered with acres of black *basalt*; some is smooth and ropey, some is rough with jagged edges.

Two thousand miles east of Hawaii, in the Cascade Mountain Range, Mt. St. Helens erupts violently. Ash and dust are blown out of the volcano with terrific force. The side of the volcano, built of the volcanic rock known as *dacite*, is blasted open. A cubic mile of rock is blasted into the air and traces of the dust rain down a thousand miles away. As the eruption ceases, dacitic lava piles up on the steep side of the volcano once again. The volcano sleeps, fitfully. Another major explosion will occur, perhaps even bigger than the last, but we do not know when.

Two volcanoes. Two very different styles of eruptions. The differences arise from the different mineralogies of each volcano's lava.

### Magma and lava

Molten rock beneath the surface of the Earth is called magma. Magma varies with factors such as the source material (i.e., the rocks that were melted to form the magma), the depth of melting, and how the magma changes as it moves toward the surface (e.g., olivine crystals might form and settle out of the magma). Also, magmas are not always fully melted – they may entrain unmelted rock fragments or mineral crystals. These unmelted fragments are called *xenoliths* (“strange stones”).

When magma flows out onto the surface, it is known as lava. Lava applies to the pools, rivers, and fountains of molten rock that flow from volcanic vents. In addition, when the melt “freezes” solid, the resulting rock may be commonly called “lava” or “lava rock.” Lava from Mauna Loa produces basalt, a dense black volcanic rock, while Mt. St. Helens produces a volcanic rock called dacite.

### Lava on Mauna Loa

A wide variety of volcanic rocks make up the Hawaiian Islands. This is not meant to be an exhaustive discussion of their types. Rather, our purpose is to compare how mineralogy affects the drastically different styles of eruptions that we observe between Mauna Loa and Mt. St. Helens.

Much of Hawaiian “lava rock” is basalt while lava from Mt. St. Helens solidifies to produce mostly dacite. Technically, basalt is an extrusive (i.e., volcanic) igneous rock that is “silica-poor” compared to dacite. Note that silica-poor means relatively low in silica, not that silica is absent. Hawaiian basalts are typically about 48.4% SiO<sub>2</sub> compared to about 63.5% SiO<sub>2</sub> for dacite from Mt. St. Helens.

Basalts are richer in iron and magnesium than dacite. Chemical analyses show Hawaiian basalts to be about 11.2% FeO and 9.7% MgO, compared to about 4.2% FeO and 2.0% MgO for Mt. St. Helens dacite. Hawaiian basalts are also lower in alumina than are Mt. St. Helens dacites (13.2% vs. 17.6% Al<sub>2</sub>O<sub>3</sub>). Due in part to higher iron content, basalt tends to be black in color while dacite is more often light gray or tan. Color, however, is not very useful in differentiating the two rocks because dacite can also be dark gray, red, or even black. Basalts are also denser than dacites, but the apparent density of a volcanic rock can be deceptive because many

eruptive rocks contain open space – vugs and vesicles formed from gas bubbles during cooling.

Basaltic lavas erupt with substantially higher temperatures than dacitic lavas. The normal temperature range for basaltic lavas is about 1100-1250°C (2012-2282°F), versus that of dacitic lavas at about 800-950°C (1472-1742°F).

## Mineralogy of a lava

If we look into the crystal structures of the above silicate minerals, we can see why basaltic lavas behave so differently from dacitic lavas.

Mineralogically, basalt is composed mostly of calcium-plagioclase and pyroxene minerals with additional minor amounts of olivine. The principal minerals in dacite are quartz, feldspar, pyroxenes, and hornblende. The pyroxenes are a group of related minerals that include augite, diopside, and enstatite. Hornblende (more properly ferro-hornblende or magnesium-hornblende) is an amphibole mineral. Note that both dacite and basalt have pyroxenes, but only dacite has quartz.

Silicate minerals are built of silica tetrahedrons – each silicon atom is surrounded by four oxygen atoms. In framework silicates (also called tectosilicates) like quartz, each silica tetrahedron attaches to four other silicon atoms, which are themselves surrounded tetrahedrally by four oxygen atoms. Thus, quartz's structure is much like a tetrahedral jungle-gym. Inter-connectedness of the silica tetrahedrons gives the quartz structure great strength and rigidity.

In olivine, each silica tetrahedron is by itself, unattached to any other silicon atoms. The silica tetrahedra are surrounded by a sea of magnesium or iron ions. This is why olivine belongs to the class of nesosilicates, or “island silicates.”

Pyroxenes and amphiboles are composed of chains of silica tetrahedra (chain silicates are called inosilicates). In these minerals, the tetrahedra are

linked at their corners to build long chains of tetrahedra. The principal structural difference between pyroxenes and amphiboles are that the former is built of single chains, while the latter has double chains (two chains linked side-by-side).

The behavior of a lava is related to the mineralogy of the rocks that it will eventually form. A molten lava is not simply a soup of unattached atoms. Rather, within the molten lava, silicon and oxygen atoms are already bonded together, and to a certain extent the silica tetrahedrons are also beginning to connect (or “polymerize”). A lava with a higher content of silica will have a higher degree of interconnectedness.

When silica tetrahedra are linked together, they make the lava “sticky” and less fluid. Molten lavas in which the silica tetrahedra are not well connected tend to flow readily. Basaltic lavas, which will form chain silicate crystals (pyroxenes and olivine), are less “sticky” than lavas such as dacitic lavas, from which framework silicates like quartz will form. Dacitic lavas, with substantially higher silica contents, are less fluid than basaltic lavas, which have lower silica contents.

## Characteristics of eruptions

In silica-rich magmas such as those that produce the dacitic lavas of Mt. St. Helens, the “stickiness” of the lava prevents gases from escaping easily. As dacitic magma rises upward within the volcano, the confining pressure (from the weight of the overlying lava and rock) decreases. Dissolved gases begin separating from the magma as bubbles, but the “stickiness” of the magma prevents the resulting gases from escaping easily. When the confining pressure decreases sufficiently, the pressure exerted by the confined gases grows greater than the confining pressure, the gases expand rapidly, and the overlying lava and rock is blown upward. This, in turn, decreases the confining pressure of deeper magma, and it too releases gas, which expands and is also blown upward. Thus, the eruption takes off violently.

When it erupts, Mt. St. Helens kicks out a great amount of ash and dust. Lavas that escape being blasted sky-high tend to pile up in sticky masses near the lava vents. Dacitic lava does not flow well. This is why stratovolcanoes (volcanoes made of alternating layers of lava and ash) like Mt. St. Helens have steep sides compared to those of Mauna Loa.

Contrariwise, fluidity of Hawaiian basaltic magmas allows dissolved gases to escape from the molten magma before an eruption occurs. The resulting lava flows quite readily and smoothly. Hawaiian basaltic lavas have been clocked at flow speeds up to 6 mph (9.6 kph). Fluidity allows basaltic lavas to flow great distances and the resulting pile of volcanic rock can be quite broad – more than one hundred miles across at its base. These large broad volcanoes are called shield volcanoes because they resemble a giant round shield lying on the ground.

The fluidity of Hawaiian basalts allows the volcanoes to create lava caves. The lava caves found in Hawaii are actually the tubes through which molten lava flowed during an eruption. Rock is a good insulator. During an eruption, the exterior (exposed to air or water) of a lava flow will cool and solidify forming a rock crust. This crust then insulates the remaining molten lava, which continues to flow. Lava flows can create their own “pipes” or tubes. The walls of these tubes form from solidified lava, and molten lava flows downhill through the tubes for considerable distances (many miles). Some tubes extend into the sea. When the eruption ceases, the tubes may drain completely, leaving a lava tube cave behind. The last bits of lava in an otherwise empty tube solidify as dagger-like “icicles” of basalt hanging downward from the ceiling.

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Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. This **Popular Mineralogy** newsletter supplement may not be copied in part or full without express permission of Andrew Sicree. **Popular Mineralogy** newsletter supplements are available on a subscription basis to help mineral clubs produce better newsletters. Write to Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805, or call (814) 867-6263 or email [sicree@verizon.net](mailto:sicree@verizon.net) for more info.

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## ***Greisens, Granites, and Tin***

Greisen is an altered granitic rock of interest to mineral collectors and prospectors alike. A greisen is composed principally of quartz, mica, and topaz. The mica is usually either muscovite or lepidolite (lithium-bearing mica).

Associated minerals formed in greisens during the alteration process include tourmaline, wolframite, rutile, and fluorite. The presence of cassiterite (SnO<sub>2</sub>, tetragonal tin oxide) is characteristic of greisen, to the extent that greisen has been defined by some as a tin-bearing rock.

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## ***Solid-Solution Series***

Mineral formulas represent an effort to write down, in “chemical shorthand,” the composition of a mineral. You may see more than one mineral formula for a mineral because it is sometimes difficult to pin down the exact composition of a mineral. Olivine is an example of mineral that occurs as a solid solution series. Mineral species lists usually report that olivine is not an accepted mineral species and they will refer you to forsterite and fayalite.

Olivine does exist, however. It is a mineral with the formula (Mg,Fe)<sub>2</sub>SiO<sub>4</sub>. The difficulty arises from the fact that magnesium (Mg) and iron (Fe) substitute completely for each other. This means that the (Mg,Fe) portion of the olivine formula could represent 80% Fe and 20% Mg, or 100% Fe and 0% Mg, or 0% Fe and 100% Mg, or any other possible ratio of the two elements. We call the magnesium-rich (>50 mole% Mg) side of the solid solution series *forsterite*, while the iron-rich olivines (>50 mole% Fe) are called *fayalite*. The “end-member” composition for forsterite is represented by Mg<sub>2</sub>SiO<sub>4</sub>, while the formula for the magnesium-free end-member fayalite is Fe<sub>2</sub>SiO<sub>4</sub>.

# March

# 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 Extreme Beaders 2:00-6:30p Faceteers II 7:00p	3 Gemcraft 7:00p	4 Gemcraft 12-4p	5	6 MSHA Training 10a-3p
7 Metalcraft 1:30p	8	9	10 Gemcraft 7:00p Faceteers I 7:00p	11 Gemcraft 12-4p Metalcraft 6:30p	12	13 Copper Box Class 10a
14	15 Beaders 6:00p	16 Extreme Beaders 2:00-6:30p Faceteers II 7:00p	17 Club Mtg 7:00p	18 Gemcraft 12-4p	19	20 Gemcraft 10a-12p
21 Metalcraft 1:30p	22 Rocky Reader April Deadline	23	24 Gemcraft 7:00p	25 Gemcraft 12-4p Metalcraft 6:30p	26	27
28 Juniors 12-2p	29	30	31 Gemcraft 7:00p			

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