

ROCKHOUNDS HERALD

920 Yorktown Road, Dothan, AL 36301-4372

www.wiregrassrockhounds.com

February 2018



Words from...

The President

Our January meeting was good despite our failed attempt to continue our rhodochrosite program. Arnie brought his rhodochrosite samples for us to examine, but the video was uncooperative. We'll try again at the next meeting. In addition, the next meeting will be the last chance to finish things off before our show in March.

As usual, we won't be having a club meeting in March, but in April we will have a special program presented by Dan Harriger, president of the North Alabama Chapter of the Gold Prospectors Association of America. He will be discussing new laws that affect us as rockhounds. Individuals are now prohibited from removing "minerals, precious metals, dirt, gravel, stones, artifacts, fossils" from the land under any waterway (high water mark to high water mark) in Alabama. Several of his club members have already been fined under this new law. When I mentioned these changes at our January meeting none of us knew anything about them so we need to take advantage of Dan's knowledge about the topic. Hope to see everyone at our February 25 meeting.

Pat

Know your stone?

The birthstone for **February** is **Amethyst**, the purple variety of quartz. Pictured in the banner above are various natural and faceted forms of this silicate mineral

Source: http://www.minerals.net/gemstone/amethyst_gemstone.aspx

Announcements

Dues are Due – If you haven't paid your current club dues, now is the time to do so. When we voted last year to revert to our original *September to August* membership year, a partial year was created. The prorated amount is \$8 for individual and \$13 for family and covers September 2017 to August 2018. Mail checks to: Diane Rodenhizer at 478 Private Road 1106, Enterprise, AL 36330.

It's Showtime!!! – Saturday and Sunday, March 17 – 18 at the Houston County Farm Center located at 1701 East Cottonwood Road in Dothan, AL. Hours are 9 AM to 5 PM and 10 AM to 4 PM, respectively. Come see!!!

Upcoming Shows

February 24 – 25	Mississippi Gem and Mineral Society	Jackson, MS
February 24	Bone Valley Gem, Mineral & Fossil Society	Lakeland, FL
February 28	The Villages Gem & Mineral Society	The Villages, FL
March 9 – 11	Aiken-Augusta Gem, Mineral & Fossil Societies	Augusta, GA
March 16 – 18	MAGMA	Arden, NC
March 17 – 18	Dothan Gem and Mineral Club	Dothan, AL

Source: <http://www.amfed.org/sfms/club-shows-123.html> and <http://www.the-vug.com/educate-and-inform/mineral-shows/>

Meeting Minutes – January 2018 – by Secretary

CALL TO ORDER AND OPEN: The meeting was called to order at 2:08 PM by President Pat LeDuc. There were 15 members and 1 guest in attendance. Our guest was Paula. Hi Paula! Glad you joined us!

INTRODUCTORY REMARKS: Birthday wishes and happiness were wished for December and January babies. Pat spoke about the passing of Esther Dunn and Maxine Johnson, and told us that according to Phil Kaiser, the Mobile club is planning to make a donation in Esther's name to the University of South Alabama. The club sent a floral arrangement to Maxine's memorial service. Since Esther's service was for family only, a motion was made and passed for us to make an equal value donation to Landmark Park in Esther's name.

CORRESPONDENCE: AFMS Newsletter. Pat received emails about field trips on the Upper Peninsula in Michigan and about a possible speaker who will bring us up to date on changes in the laws regarding collecting fossils/specimens from waterways in Alabama. Pat will follow up with the speaker to see if he is available for our April meeting.

MINUTES & TREASURER REPORT: Minutes from the November meeting were approved and seconded. Diane Rodenhizer provided the treasury report; also approved. The club is financially strong and prepared for the upcoming expenses for the 2018 show in March.

SHOW BUSINESS: Bruce Fizzell brought in show flyers for members to take and distribute. Jeff DeRoche spoke with Mickey, our contact at the Houston County Farm Center, and confirmed our rental fee for the 2018 show will be the same as last year. Jeff reiterated the larger space is available to us, but the group consensus is we are better off in limiting the number of vendors despite the many requests for tables. The thinking is that more vendors would likely dilute the profits for all. New signage is on order and Pat will be taking care of getting new large banners to be used on the show site. JoAn Lambert told us that the Grab Bag material is in and the bags can now be assembled.

OLD BUSINESS: No Old Business was discussed during this meeting.

NEW BUSINESS: The search for a new VP and Newsletter Editor is on hold for the moment. Elliott Whitton is doing a teaching presentation for school children at Landmark Park this coming Tuesday.

FIELD TRIP REPORT: Nothing to discuss for today. Field trip season will be starting up again soon.

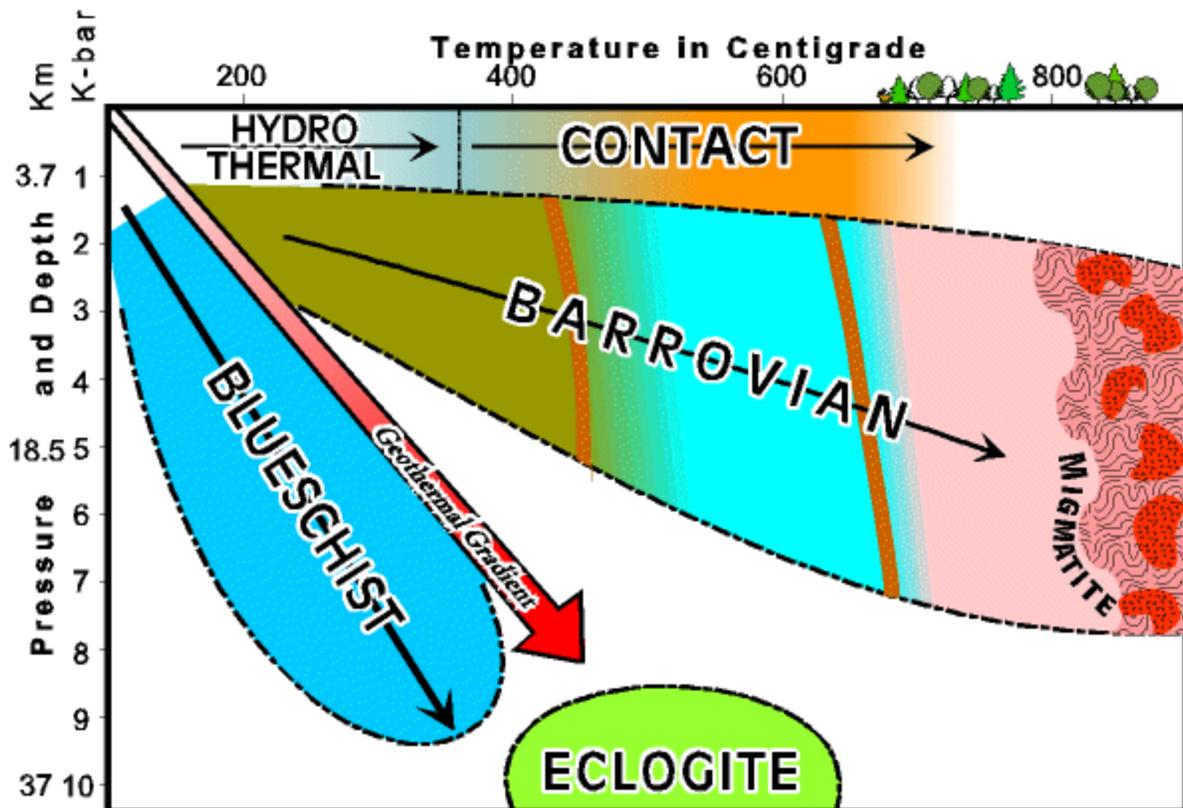
PROGRAM AND SHOW & TELL: Today's activity—part two of a video about rhodochrosite mining—encountered technical difficulties, so we will try again at the next meeting. Nevertheless, Arnie Lambert brought in some actual rhodochrosite samples for us to see. Joan Blackwell had a nice quartz crystal formation she found at a rock shop in Hot Springs, AK. Ben Childress had a nice collection of new marine fossils he had collected, many from a local site called *Boggs and Boulders*.

Door Prizes for this month went to Joan and to our visitor/new member, Paula.

-- Respectfully submitted by B. Fizzell

KINDS OF METAMORPHISM

Metamorphisms are not all alike. A variety of metamorphisms occur depending on temperature and pressure (T/P) conditions. The variety of metamorphic processes can be summarized in a T/P phase diagram (below). Observe that temperature increases across the top from "normal" earth surface conditions to nearly 1000 degrees C.



Pressure is plotted down the side of the diagram. The earth's surface is at the top of the diagram, so the further down you go the greater the pressure. Pressure is measured in *bars*. A *bar* is one atmosphere of pressure, about 14 pounds per square inch. The scale on the phase diagram is in kilobars, thousands of atmosphere of pressure. We have also plotted depths in kilometers along with the pressure.

Observe on the phase diagram above the five kinds of metamorphism: Hydrothermal, Contact, Barrovian (sometimes called " regional"), Blueschist, and Eclogite. Each is introduced below.

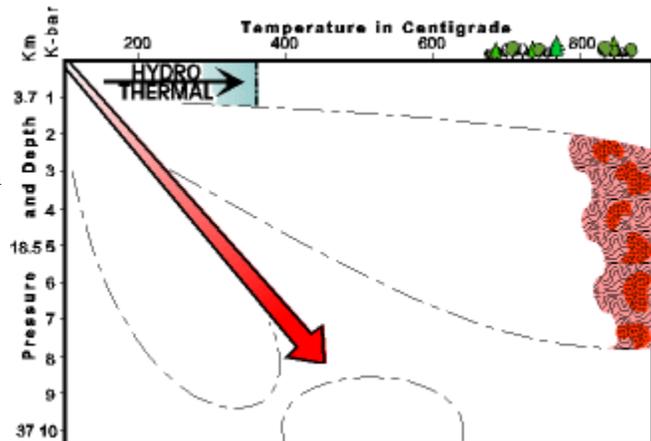
[Note that this is drawn the opposite of a technical phase diagram where pressure increases from the bottom to the top of the diagram. We have chosen this diagram to allow easy reference to pressure and depth, which naturally increases as one descends deeper.]

Hydrothermal Metamorphism:

>>>Low Temp./Low Pressure

>>>Typical Rocks: pegmatites, serpentinite, soapstone

Hydrothermal metamorphism occurs when hot, chemically active, mineral laden waters interact with a surrounding preexisting rock (called the *country rock*). Most hydrothermal metamorphism takes place at low pressures and relatively low temperature, as the phase diagram shows. It is one of the most pervasive and widespread types of metamorphism, although most of it cannot be seen easily. There are also several distinctly different types of hydrothermal metamorphism.



IGNEOUS FLUIDS AND PEGMATITES: The most spectacular hydrothermal metamorphism takes place as an after effect of igneous activity. Magmas have lots of water with dissolved minerals, but as the magma crystallizes the mineral laden water is driven off into the surrounding country rock where it seeps into cracks and pores precipitating the minerals.

The most spectacular result of this is a *pegmatite*, a very coarse grained *felsic* igneous rock. Pegmatites commonly have single crystals measured in feet in size, as well as a host of exotic minerals, including some of the most important gem minerals.

Hydrothermal deposits of this type also produce many important mineral deposits, from silver and gold to copper.

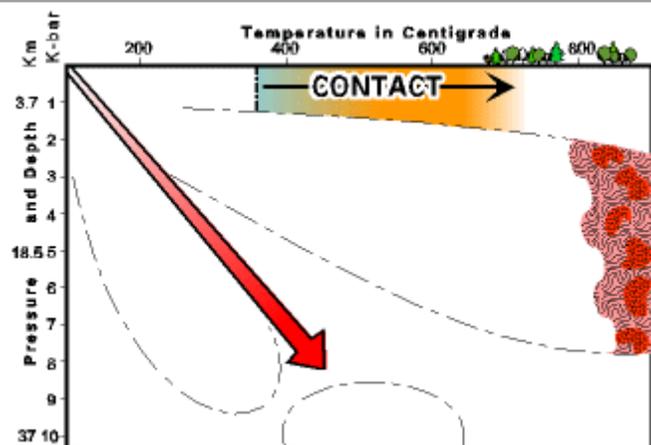
OCEANIC HYDROTHERMAL METAMORPHISM: A second type of hydrothermal metamorphism takes place at oceanic rift centers (*divergent plate boundaries*). Here magma oozes out onto the ocean floor to form pillow basalts. While the rock is still hot, sea water carrying all its salts percolates into the rocks where a lot of chemical reactions take place. Minerals are leached out of the rock and carried to the surface where they often form *smokers*, geysers on the ocean floor.

Contact Metamorphism:

>>>High Temp./Low Pressure

>>>Typical Rocks: hornfels, quartzite, marble, skarn

Contact metamorphism occurs in the "country rock" (the rock intruded by and surrounding an igneous intrusion). Rocks are "baked" into a ceramic from heat escaping from intrusives, often enhanced by hydrothermal fluids. The intensity of metamorphism decreases with distance from the intrusion, until at some distance away the rock is unaltered country rock.



The metamorphism often occurs in aureoles, or zones surrounding the intrusion. Close to the intrusion is the *hydrothermal (or metasomatic) aureole* where minerals from the hot fluids have

their greatest effect. Further away is the thermal aureole where heat is the primary effect. The dimensions of the aureoles are dependent on the size of the intrusive body and the amount of water present. In the absence of fluids, the aureole is very small.

The assemblage of new minerals that grow in the country rock depend on the composition of the country rock. For a complex sedimentary parent of sandstones and shales, anhydrous (without water) minerals such as garnet and pyroxene occur closest to the intrusion, then hydrous (water rich) minerals such as amphibole and epidote, and at the lowest intensity, chlorite and serpentinite occur.

When magma intrudes into carbonates such as limestone and dolostone, the carbonate reacts with silica from the hydrothermal fluids to form SKARN. Many special lime-bearing silicate minerals form here.

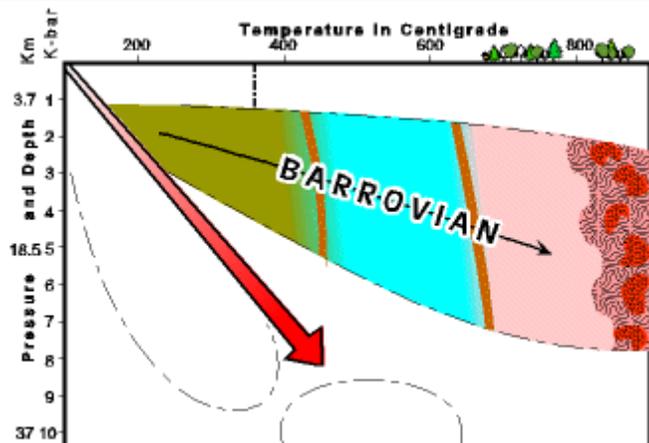
Barrovian Metamorphism:

Low-High Temp./Intermediate Pressure

Typical Rocks: slate, phyllite, schist, gneiss, migmatite; quartzite, marble

This is a common, widespread, large scale metamorphism typically associated with major orogenic (mountain building) events. Sometimes this is referred to as "regional metamorphism", but since it is not the only metamorphism to take place on a regional scale Barrovian is a more precise name.

Barrovian metamorphism produces some of the most common metamorphic rocks, many of which are spectacularly beautiful and, thus, used as building stones.

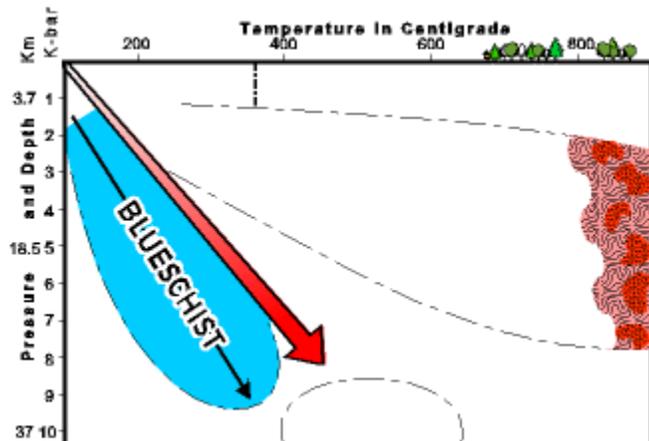


Blueschist Metamorphism:

Low Temp./High Pressure

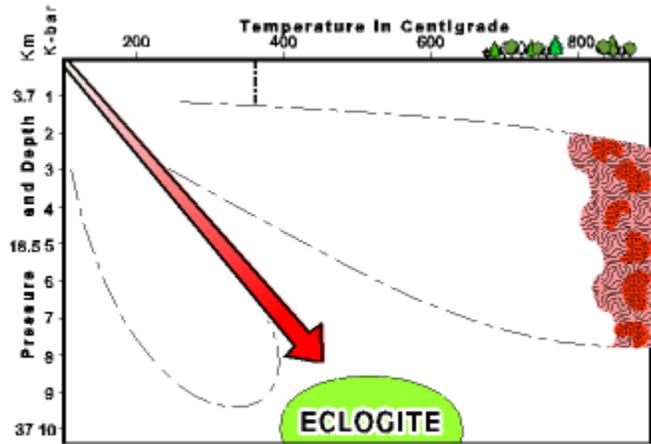
Typical Rocks: blueschist

Blueschist metamorphism occurs at *convergent plate boundaries* in *subduction zones*, either under *volcanic arcs*, or under *continents* (cordilleran type). Here cold oceanic crust and sediment is rapidly subducted. Pressure increases quickly because of depth, but the temperature lags behind because the rock is being buried faster than it can heat up. Rocks in outcrop appear blue from amphibole mineral glaucophane.

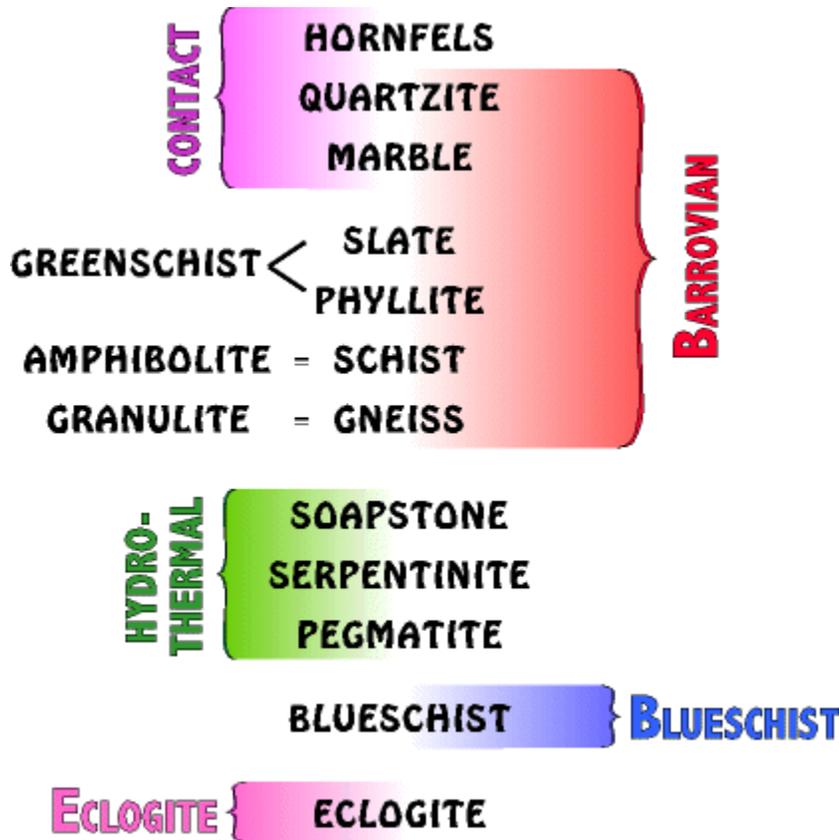


Eclogite Metamorphism:
Moderate Temp./Very High Pressure
Typical Rocks: eclogite

Eclogite metamorphism takes place in the mantle. The parent rock is ultramafic mantle material, such as peridotite. Eclogite is characterized by a pale green sodic pyroxene (omphacite) and a red garnet (almandine-pyrope), making it a striking rock. Associated minerals are rutile, kyanite, and quartz, and it is not unusual to have retrograde amphibole in the rock too. Since eclogite forms so deep, outcrops are not common.



The chart below arranges metamorphic rocks according to their classification.



Source:
 Reprinted with permission from Lynn S. Fichter
<http://csmres.jmu.edu/geollab/fichter/MetaRx/MetaKind.html>

Club Meeting – January 2018

Photos by Pat & Bruce



The Mohs Test: How to Compare the Hardness of Minerals

Problem: Some minerals are harder than others because of how strongly their atoms are bound together at the molecular level. How do we find out which minerals are harder and which are softer?

Materials:

8 mineral samples: *amethyst, azurite, calcite, lodestone, mica, rose quartz, talc, pyrite*
1 fingernail (your own is fine!)
1 copper penny
1 steel nail
1 piece of quartz
1 pencil
1 piece of lined or graph paper

Procedure:

1. Along the top of the paper, create columns by writing Mineral, Fingernail (2.5), Copper (3), Steel (5.5), Quartz (7), and Hardness.
2. Write the name of each mineral sample in a list down the left-hand side of the page under "Mineral."
3. Put each mineral sample on top of its name on the paper.
4. Starting with the first mineral, test how hard it is by trying to scratch it. First try to scratch it with your fingernail, then the copper, then the nail, then the quartz. Be careful! Sometimes something that's much softer than something else will leave a line of powder that looks a lot like a scratch. If you think you have a scratch, rub at it with your thumb. If it's just powder, it'll rub off, but if it's really a scratch, it'll still be there.
5. If you can scratch the mineral with your fingernail, put an "X" in the "Fingernail" column. If not, leave it blank and go on to the next column. If you can scratch the mineral with copper, put an "X" in that column. Keep going until you have tried to scratch the sample with all of your hardness testers. If nothing makes a scratch, leave all of the columns blank.
6. Your testing materials will leave a scratch if they are the same hardness as or harder than the sample. If you get a scratch, the hardness of the mineral is probably somewhere between the hardness of that testing material and the one before it. So, for example, if the quartz and the nail leave scratches on a sample but the penny doesn't, the hardness of the sample is most likely somewhere between copper, hardness 3, and steel, hardness 5.5. So split the difference and call it a 4 on Mohs' Hardness Scale. Write this number down in the "Hardness" column.
7. If not even the quartz will make a scratch, your sample is harder than quartz (7), so write ">7" in the "Hardness" column. If all of the tests produce a scratch, your sample is softer than fingernails (2.5), so write "<2.5" in the "Hardness" column.
8. Repeat this procedure for all of your samples.
9. When you're done, turn the piece of paper over or use a new piece of paper and write a list of your mineral samples again. This time, instead of putting the names in alphabetical order or whatever order you used the first time, list them in order of hardness, from softest (lowest number) to hardest (highest number). You now have a relative hardness scale of your samples.

Rock Formations

There are some amazing natural rock structures in the world. They are either naturally formed or formed in various ways of erosion: (worn away) by glaciers, blowing sand in the desert, water or weathering such as wind and rain. There are three types of naturally formed rocks:

1. **Sedimentary.** This means they formed grain by grain, layer by layer, either in the water where rocks and dirt settle to the bottom or on land by erosion.
2. **Metamorphic.** This means the rocks are made from other kinds of rocks or minerals. This happens with heat, pressure and chemical reactions.
3. **Igneous.** These kinds of rocks are made when lava or molten rocks cool and become solid. Sometimes these have crystals that form in them. Erosion then forms the lines and curves of these rock formations. One igneous rock formation is Half Dome in Yosemite National Park.



A Mushroom Rock formation in Mushroom Rock State Park in Kansas. It was formed by the erosion of a harder rock on top of a softer rock. Part of the rock is sandstone.



Jug Rock

Jug Rock is made of sandstone. It is in Shoals Indiana in the Valley of the East Fork of the White River. Jug Rock is the largest free-standing table rock formation or "tea table" in the USA east of the Mississippi River. It is 60 feet high and 20 feet in diameter.



Half Dome Photo by: Rainer Hübenthal posted on Wikipedia

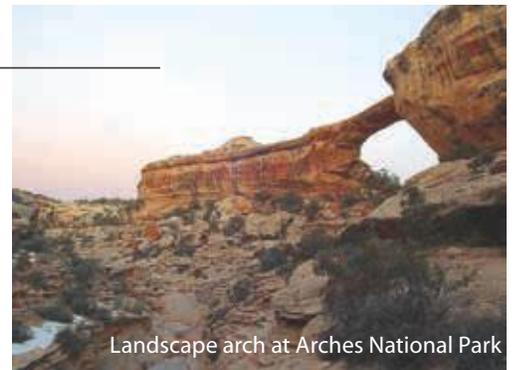
Rock Trivia

1. What are the three types of naturally formed rock formations?

2. What kind of rock is Half Dome in Yosemite National Park?

3. What is another name for a table rock formation like Jug Rock?

Owachomo Bridge at Natural Bridges National monument



Landscape arch at Arches National Park

Who What Where When Why How

February Birthdays

FEB 23 Chris Wisham

FEB 24 John Webber

FEB 28 Bill Tharpe

Random Rock Facts

Gem/mineral hardness can be directional. This is actually quite understandable, as it depends on chemical bonds which can differ in strength, and in distance from each other, depending on which axis of the crystal we are observing. Generally, such differences are relatively small and of little consequence, but there are two notable cases where they are dramatic and important:

- 1) Kyanite is notoriously difficult to cut because of its extreme directional hardness differences.
- 2) Diamond cutting would scarcely be possible unless the cutters could use the directional hardness of that gem to their advantage.

Reprinted with permission from Dr. Barbara Smigel

Source: www.bwsmigel.info/Lesson3/DEPhysical.Properties.html

Meeting Information

Time: 2:00 PM

Date: Fourth Sunday of each month (except June, July and August)

Place: Fellowship Hall – Tabernacle United Methodist Church
4205 S. Brannon Stand Road
Dothan, AL

Officers

President – Pat LeDuc
334-806-5626

Vice President – Garry Shirah
334-671-4192

Secretary – Bruce Fizzell
334-577-4353

Treasurer – Diane Rodenhizer
334-447-3610

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Membership Chair – Diane Rodenhizer
334-447-3610

Show Chair – Jeff DeRoche
334-673-3554

Field Trips Chair – Garry Shirah
334-671-4192

Hospitality Chair – Vacant

Club Hostess – Vacant

Club Liaison – Garry Shirah
334-671-4192

Website: www.wiregrassrockhounds.com

Objectives

To stimulate interest in lapidary, earth science and, when necessary, other related fields.

To sponsor an educational program within the membership to increase the knowledge of its members in the properties, identifications and evaluations of rocks, minerals, fossils and other related subjects.

To cooperate and aid in the solution of its members' problems encountered in the Club's objectives.

To cooperate with other mineralogical and geological clubs and societies.

To arrange and conduct field trips to facilitate the collection of minerals.

To provide opportunity for exchange and exhibition of specimens and materials.

To conduct its affairs without profit and to refrain from using its assets for pecuniary benefit of any individual or group.

Classified Ads

Looking for an item to round out your rock collection?

Got a specimen, tool or handicraft for sale or trade?

Submit the pertinent details to me by the 10th of each month and your inclinations will be made known to the membership in the next bulletin.

N. J. Blackwell
28 Lakeview Trail, Apt. C
Daleville, AL 36322
Phone: 334-503-0308
Email: Tfavorite7@aol.com

Annual Dues

Single \$15
Family \$20

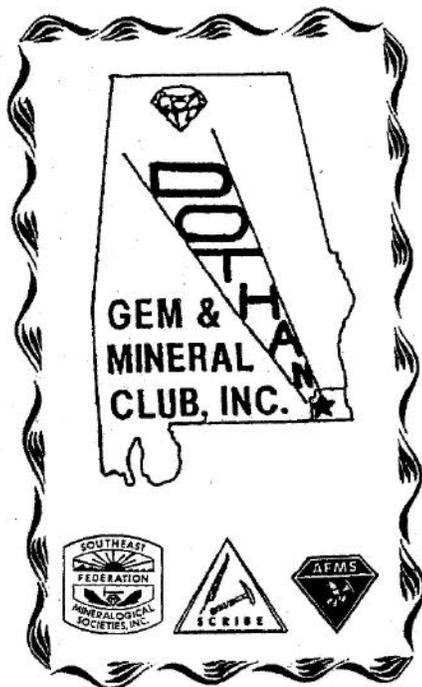
Refreshments

FEB 25 – Potluck Refreshments

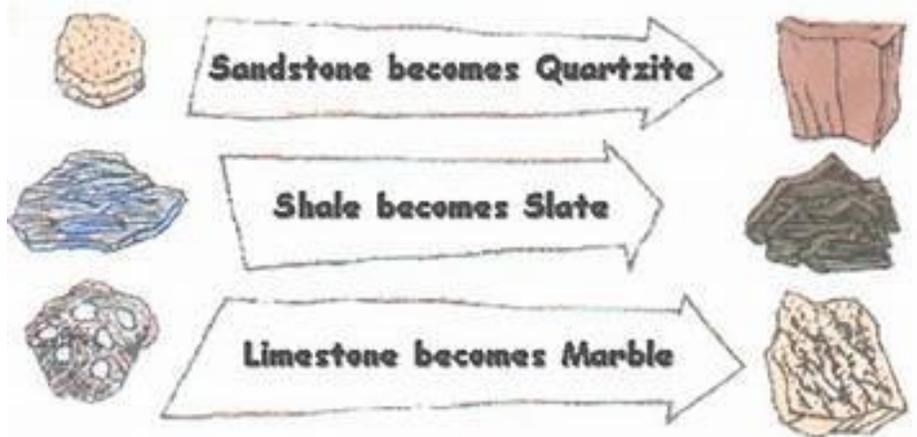
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Where you might hear...



Source: <http://joberts11.wikis.birmingham.k12.mi.us/Chance++MetamorphicRocks>

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