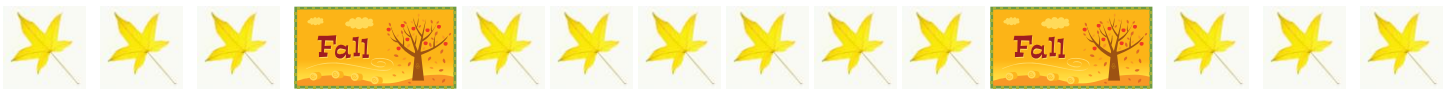
The official bulletin of the Dothan Gem & Mineral Club, Inc.

Rockhounds Herald

920 Yorktown Road, Dothan, AL 36301-4372

www.wiregrassrockhounds.com

September 2012



Words from...

The President

It's finally time to resume the monthly meetings and we'll do so this coming weekend on Sunday, September 23. Hopefully, everyone had a good summer and will have lots of new specimens to bring to the meeting for Show and Tell. If you don't have any new rocks, just bring along a friend or neighbor. (Tell them there will be light refreshments. That's always a good selling point for a Sunday afternoon outing.)

In this issue, we have the Limestone County installment of Alabama's "Super Sites", an article on specific gravity aimed at the young members of the club, and a special guest feature on regional metamorphism. No pictures this month. The only event since the August Social was one where Arnie and I spoke to the Providence Christian School Gem and Mineral Class and those pictures have been on the website now for several weeks. Check them out if you haven't seen them already.

On a sad note, for those who may not have heard, clubmember Steven Ward experienced a tragic loss last month when his wife, Brenda, passed away unexpectedly while in Arkansas. She was his high school sweetheart and the love of his life. They'd been married 42 years. Brenda's obituary and picture can be accessed at the following link: http://www.rollerfuneralhomes.com/services.asp?page=odetail&id=28346&locid= Please remember Steven and his family in your thoughts and prayers.

See you on the 23rd. JoAn

Upcoming Digs

October 5 – 7	**Graves Mountain Rock Swap and Dig**	**Washington, GA**

Source: www.gamineral.org/commercial-gravesmountain.htm

Upcoming Shows

September 21 – 23	**Jacksonville Gem and Mineral Society 24th Annual Show**	**Jacksonville, FL**
October 6 – 7	**Rockhounds of Central Kentucky (ROCK) 22nd Annual Gem, Mineral & Jewelry Show**	**Lexington, KY**
October 12 – 14	**Huntsville Gem and Mineral Society**	**Huntsville, AL**

Source: www.amfed.org/sfms/

Special Guest Feature

Barrovian Metamorphic Rock Changes

The best known and most commonly seen metamorphic rocks are those produced by Barrovian (also called regional) metamorphism.

Beginning with a shale parent, Barrovian metamorphism produces a sequence of metamorphic rocks that goes through slate, and then through phyllite, schist, and gneiss. It can be hard to imagine at first that all these very different looking rocks can come from the same sedimentary parent, but we know that they do. This demonstrates the hidden truths that lie within the earth, and to the profound changes that earth processes can effect.

shale >>> *slate* >>> *phyllite* >>> *schist* >>> *gneiss*

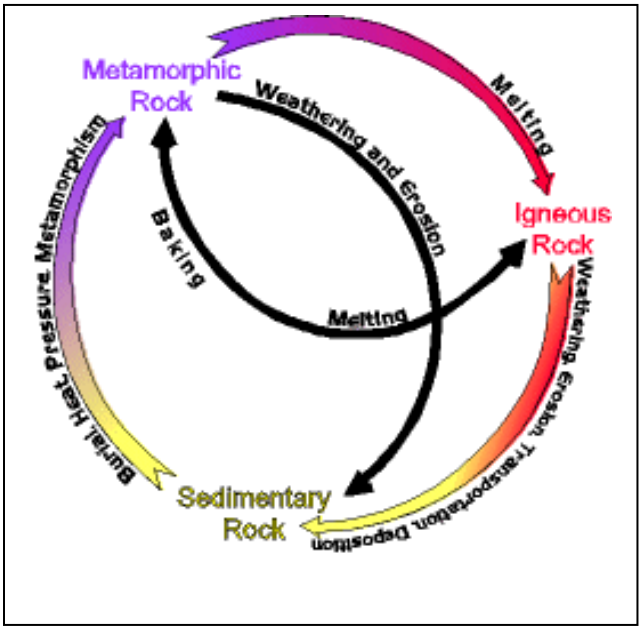





But even with gneiss the process is not done, because if the temperature rises even higher the gneiss begins to melt. Such a partially melted rock is a ***migmatite***.

Finally the rock melts completely and we have entered the igneous realm with a magma. When the magma solidifies we now have an igneous rock, in this image, a *plagiogranite*.

In this transformation from a sedimentary rock (shale) through the various metamorphic rocks, and finally ending with an igneous rock we see one of the fundamental pathways through the rock cycle. It is transformations of this kind that have resulted in all the great diversity of rocks we find on the earth.



Lynn S. Fichter © 2000
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James Madison University, Harrisonburg, Virginia 22807

Source: *http://csmres.jmu.edu/geollab/fichter/MetaRx/Barmetachanges.html*

Limestone County

Limestone County comprises 559 square miles and is located in the northwest part of the state. It is part of the Highland Rim physiographic section and consists of limestone valleys and uplands. It was named for a creek that flows through it whose bed is made of hard limestone. The county is bordered by the state of Tennessee to the north, Madison County to the east, Morgan and Lawrence counties to the south, and Lauderdale County to the west.

The Tennessee River and its tributaries run throughout the county. Elk River, one of the system's largest tributaries, drains much of Limestone County. The shores of the county's rivers are typically lined with oak and hickory forests. The earliest settlers found the level, fertile land good for farming a variety of crops, such as corn, wheat, and oats as well as cattle and hogs. Agriculture was the prevailing industry of the county until well into the twentieth century, however, industrialization was given a significant boost in the late nineteenth century with the completion of a series of locks and dams along the Tennessee River. Today, the principal industries in Limestone County center on the space and technology industries.

There are a number of recreational opportunities for visitors to Limestone County ranging from the natural to the historical, and from the technological to the cultural. The Bayhill Village and Marina is one of Alabama's largest inland marinas. A 10.3-mile Rails to Trails site in Elkmont offers folks an opportunity to retrace the steps of Civil War soldiers, while in Athens there's a museum displaying memorabilia from the Revolutionary War to the present. The 8,870-acre Swan Creek Wildlife Management Area offers waterfowl, small game, and deer hunting. The Antebellum Trail—featuring 24 period homes, three churches and two working cotton plantations—winds through eastern Limestone County. Ardmore hosts an annual Renaissance Faire in April and a bluegrass festival in May. Later, in October, Athens hosts the famed Tennessee Valley Old Time Fiddlers Convention where musicians and buck dancers compete for more than $10,000 in prize money.

Super Site Selection Criteria

Limestone County was selected as a Super Site for this series on the basis of information reported in *Rocks and Minerals of Alabama – A Guide for Alabama Rockhounds (Circular 38, 1966)*.

The guide identified five minerals—calcite, fluorite, gypsum, limestone, pyrite—as being prominent at a limestone quarry in the Elkmont area on Alabama State Highway 127, approximately one mile south of the intersection with Limestone County Road 84.

Featured Rocks and Minerals

Calcite – CaCO3 – calcium carbonate and a known rock forming mineral.

Calcite is the stable form of the widely distributed mineral calcium carbonate and sometimes occurs with the impurities iron, magnesium, or manganese, and occasionally zinc and cobalt. It is one of the most common minerals on the face of the earth, comprising about 4% by weight of the earth's crust. It can form rocks of considerable mass and constitutes a significant part of all three major rock classification types.

Formed in many different geological environments, there are more than 300 crystal forms identified in calcite and these forms can combine to produce the thousand different crystal variations. Though the most common are scalenohedral (also called the "Dogtooth Spar") and rhombohedral, calcite crystals may be tabular, acicular, prismatic, flaky, and needle-like.

A member of the hexagonal crystal system, calcite is a transparent to translucent mineral with a glassy to dull luster and a white streak. It is brittle, has perfect cleavage in three directions, and results in a conchoidal fracture. It is easily scratched (3.0 on the Mohs Scale). Pure calcite is generally white or colorless, however, impurities change the color to the many shade combinations of red, yellow, and green. As an example, manganese discolors calcite pink and iron tints calcite yellow. Specimens may also be multicolored or banded. Calcite dissolves in cold dilute hydrochloric acid or vinegar with effervescence, and exhibits an unusual characteristic called “retrograde solubility” in which it becomes less soluble in water as the temperature increases. Fluorescence, phosphorescence, thermoluminescence and triboluminescence are other important properties of calcite.

Calcite is the primary mineral component in cave formations such as stalactites and stalagmites, cave veils, cave pearls, and "soda straws". When conditions are right for precipitation, calcite forms mineral coatings that cement the existing rock grains together and can even fill fractures. However, when conditions are right for dissolution, the removal of calcite can dramatically increase the porosity and permeability of the rock. If it continues for a long period of time it may result in the formation of new caves or the collapse of existing caves.

Calcite has more uses than almost any other mineral. It is used as a construction material, abrasive, agricultural soil treatment, construction aggregate, pigment, pharmaceutical and more. Flawless transparent calcite is used in optical instruments, especially in geological (polarizing) microscopes. In addition, its many interesting forms, varieties and colors make it one of the best collection type minerals.

Fluorite – Note: this mineral was previously profiled in the Bibb County section of the *Learning Series: Alabama’s Rocks and Minerals – “The Super Sites”*. Please see the February 2012 issue for complete details. It is available at www.wiregrassrockhounds.com.

Gypsum – $CaSO_4 \cdot 2H_2O$ – hydrated calcium sulfate.

Gypsum is a very soft mineral composed of calcium sulfate dihydrate and has the distinction of being the most common sulfate mineral on earth. It is a major rock forming medium that occurs in massive beds, as free crystals in clay beds, and crystallized in limestone cavities. Gypsum crystals can be extremely large – among the largest on the planet. Precipitated out of highly saline waters, extensive sedimentary deposits are commonly interbedded with limestone, shale, sandstone, clay, and rock salt; thus, gypsum can have many inclusions of other minerals and even trapped bubbles of air and water.

There are several crystal varieties of gypsum. Selenite is a coarsely crystalline material with a pearl-like luster that has been described as having a “moon-like” glow. Satin Spar is an aggregate material composed of parallel fibers that give a play of light up and down the fibrous crystals, and Alabaster is a fine-grained massive material used in fine ornamental carvings.

A member of the monoclinic crystal system, gypsum has good cleavage in one direction and distinct cleavage in two others. With a hardness level of 2.0, it can be scratched by a fingernail and serves as a low-end reference point for hardness on the Mohs Scale. It is typically transparent to translucent with a vitreous to pearly luster. It streaks white and has a conchoidal fracture. Collectors may find that some samples are fluorescent yellow. With a very low thermal conductivity (hence it's use in drywall as an insulating filler), a crystal of gypsum will feel noticeably warmer than a like crystal of quartz. Gypsum is usually white, colorless or gray, but can also be shades of red, brown and yellow.

Crystal habits include tabular, bladed or blocky crystals with a slanted parallelogram outline. Gypsum crystals are flexible but not elastic, meaning they can be bent but will not bend back on their own. In nature, some specimens bend into spirals (known as "Ram's Horn Selenite"). Two types of twinning are common; one produces a "spear head twin" or "swallowtail twin" while the other type produces a "fishtail twin". Sheets of clear crystals can be easily peeled from a larger specimen.

Gypsum is an industrially important mineral. In addition to its use as wallboard, it is instrumental for making paint, Portland cement, roof tile, paper, and plaster of Paris. It is also used as a fertilizer and soil conditioner.

For the collector, gypsum offers a few mineralogical oddities. In a small number of specimens, water gets trapped inside a hollow channel while the crystal is forming. When such a crystal is rotated, a “bubble" can be seen moving around inside the channel. These are called "enhydros". The fibrous Satin Spar variety of gypsum is sometimes cut into cabochons because of its strong cat's eye effect. And finally, specimens that form in a sandy area often have either “hourglass-shaped” inclusions or can manifest as “Desert Rose” rosettes (not to be confused with the barite specimen of the same name).

Limestone – $CaCO_3$ – a sedimentary rock composed chiefly of calcium carbonate.

Limestone is, by definition, a rock that contains at least 50% calcium carbonate in the form of calcite. However, all limestones contain a percentage other materials. This can be variable amounts and types of chert (e.g., chalcedony, flint, jasper, etc.), the siliceous skeletal fragments of sponge spicules, diatoms, and radiolarians, and the terrestrial detritus (clay, silt and sand) carried in by rivers.

Limestone is almost always marine in origin—specifically clear, warm, shallow ocean water. While the biological limestones are more abundant, some limestones are formed completely by the chemical precipitation of calcite and do not consist of grains. Stalactites, stalagmites and other cave formations (often called "speleothems") are examples this. A third mechanism for limestone formation is via evaporation at a hot spring or similar area.

Limestone makes up about 10% of the total volume of all sedimentary rocks. Bands of the material often emerge from the earth's surface in spectacular rocky outcrops and islands. It is less resistant than most igneous rocks, but more resistant than most other sedimentary rocks and often results in erosion landscapes, such as caves, pot holes, cenotes, gorges and limestone pavements. It is therefore usually associated with hills and downland, and occurs in regions with other sedimentary rocks, typically clays. In Alabama, limestone is found in great quantities and is quarried in the northern part of the state in the Paleozoic area.

Because of impurities, many limestones exhibit a range of colors, especially on weathered surfaces. They can vary from snow white to black and in texture from very fine grained to very coarse grained. This results in limestone being called by many different names based upon how the rock formed. Chalk is a soft, fine-textured and light-colored limestone. Coquina often forms on beaches with strong wave action and is essentially broken and poorly cemented shell debris. Fossiliferous Limestone contains obvious and abundant fossils. Lithographic Limestone is a smooth, dense specimen with very fine and uniform grain size that has been used in the past for reproducing drawings in the printing industry. Oolitic Limestone is mainly small spheres formed by the concentric precipitation of calcium carbonate on a sand grain or shell fragment. Travertine is an example of a limestone that forms by evaporative precipitation, often manifesting as cave formations. Tufa is a limestone produced by evaporation of calcium-laden waters at a hot spring, lake shore or other location. Limestones that will take a polish are considered marbles by most people, but technically, if there are still shells visible or the structure is not crystalline, it is still a limestone.

Limestone is a rock with an enormous diversity of uses, though most is crushed and used as a construction material, e.g., road beds, roofing shingles, etc. It is the raw material for the manufacture of quicklime (calcium oxide), slaked lime (calcium hydroxide), cement and mortar. Called “rock dust”, it can suppress methane explosions in underground coal mines. In addition, it is added to toothpaste, paper, plastics, paint, tiles, and other materials as both white pigment and a cheap filler. Purified, it is even added to bread and cereals as a source of calcium.

Pyrite – Note: this mineral was previously profiled in the Clay County section of the *Learning Series: Alabama's Rocks and Minerals – "The Super Sites"*. Please see the April 2012 issue for complete details. It is available at www.wiregrassrockhounds.com.

Additional Minerals of Limestone County

In addition to calcite, fluorite, gypsum, limestone and pyrite, the www.mindat.org website currently lists the presence of four other mineral specimens in Limestone County: "apatite' (var. cellophane), dolomite, niter and quartz.

Over 20 mines are on record in Limestone County. Most sites are clustered to the northwest of Elkmont.

Sources:

http://www.mindat.org/lsearch.php?from=nsearch&loc=alabama
http://www.encyclopediaofalabama.org/face/Article.jsp?id=h-1289
http://geology.com/minerals/
http://en.wikipedia.org/
http://www.minerals.net/
http://www.galleries.com/
http://www.minerals-n-more.com/
http://www.minerals.net/mineral/
http://www.mii.org/minerals/
http://www.mineralszone.com/

Kid's Corner

What is "Specific Gravity"?

When you look at an entry for a mineral in a mineral handbook or textbook, you will see a listing of that mineral's physical properties. When the properties are listed, the name of each property isn't always written out. So, instead of seeing "Hardness = 2.5" you might see "H: 2.5". Another physical property that is not usually written out is "Specific Gravity." It is usually written in a short form as "Sp. Gr. = ____" or "SpGr = _____" and some books just write "gravity".

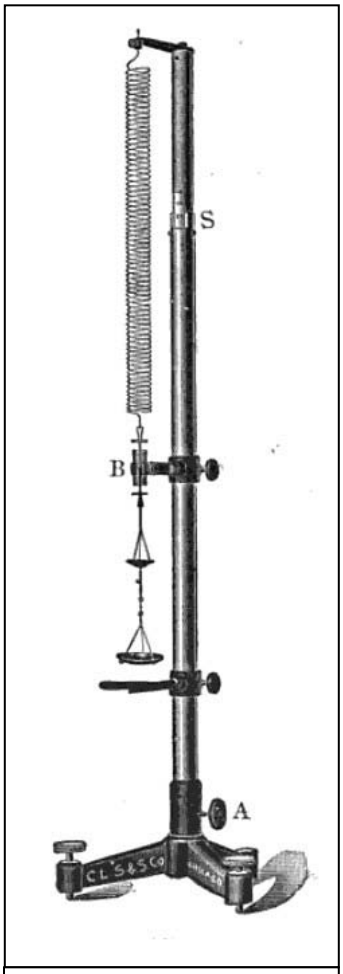
What is "Specific Gravity"? Many mineral collectors think that it has something to do with the weight of a mineral. The specific gravity of a mineral will affect its weight. But remember, the size of a specimen also affects the weight. A quartz specimen the size of your hand may weigh a pound or less. A quartz crystal that size of an adult human will weigh hundreds of pounds.

"Specific Gravity" is actually a comparison. It is a comparison between the weight of a mineral and the weight of an equal amount of water. In other words, specific gravity is a number that tells you how many times more a particular mineral species weighs than the same amount of water.

Here's a better way of understanding "Specific Gravity." The specific gravity of silver is 10. If you had a bucket of silver and a bucket of water that is exactly the same size, and both buckets are filled right up to the top, the bucket of silver will weigh 10 times as much as the bucket of water. Here's another example. If you have the same bucket of water, and now you have next to it a bucket of the same size filled with calcite, the calcite will weigh about 2 1/2 times as much as the bucket of water.

Now you try it. The mineral *fluorite* has a specific gravity of 3.4. This means a bucket of fluorite weighs 3.4 times as much as an equal bucket of water. Metallic minerals, like galena, pyrite, and hematite have higher specific gravities than minerals that don't contain metals (like lead and iron). Galena's specific gravity is 7.5. So (here we go again) a bucket of galena weighs...you got it… 7.5 times as much as an equal bucket full of water.

The mineral with the highest specific gravity is platinum. The specific gravity of pure platinum is 21.5. If you were rich enough to buy a bucket of pure platinum, it would weigh how many times an equal bucket of water? That's right, 21.5 times as much!



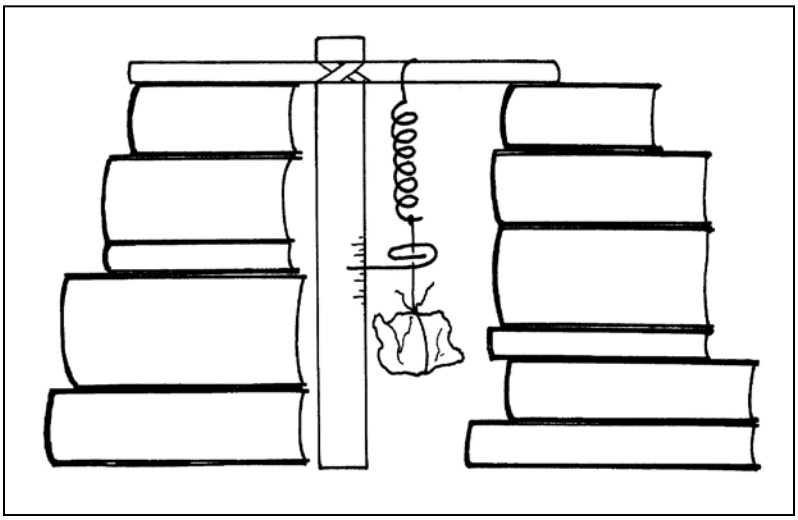
An engraving of a Jolly Balance from *A Manual of Physical Measurements, page 57* , by John O. Reed and Karl E. Guthe, 1913. This image is in the public domain.)

To the left is a picture of a piece of laboratory equipment that was invented to measure specific gravity. It is called a "Jolly Balance." It is called this not because it makes you happy, but after its inventor, a German physicist named Philipp von Jolly. It is designed so that you can first measure the weight of a piece of a mineral in air, and then the weight when the same specimen is place in a cup of water. Then, the following formula is used to determine the specific gravity:

$$\frac{\text{Weight of Mineral in Air}}{(\text{Weight of Mineral in Air}) - (\text{Weight of Mineral in Water})}$$

You can create your own Jolly Balance by using some basic materials you have at home or in your laboratory. Collect the following items: ruler, spring (or rubber band), string, pencil or stick, two wooden blocks or stacks of books, a paperclip and a jar filled with water.

Tie a mineral specimen to a string and tie the other end of the string to the spring on your Jolly Balance. Let the mineral hang down and record the reading indicated by the paper clip pointer on your ruler. Be as accurate and precise as possible (for instance, measure to the nearest 1/16th of an inch rather than the nearest 1/8th of an inch). Raise the mineral and place the cup of water under the mineral. Let the mineral hang down into the cup of water. Record the reading indicated by the paper clip pointer, again to the nearest 1/16th of an inch. These are the two numbers you need to calculate the Specific Gravity. Use the formula above. Hint: use a spring or rubber band that is not too strong. It needs to be able to stretch easily, but not so easily that the mineral specimen pulls it right down to the table top!



Source: Mini Miners Monthly, Vol 6 No 7., from www.diamonddanpublications.net

Who What Where When Why How

September Birthdays

SEP 9 – Margie Cody

Penny Poulos

SEP 21 – L. J. Ward

Random Rock Facts

Specific Gravity – the relative weight of any substance when compared to an equal volume of water.

To accurately determine specific gravity of a mineral it must be weighed once in the air and a second time while suspended in water. The difference between the two weights equals the weight of the volume of water displaced. Divide the weight of the displaced water into the weight of the mineral to calculate the stone's specific gravity.

Sapphire, the birthstone for September, has a specific gravity of 3.9 – 4.1, meaning it is approximately four times heavier than water.

Sources: National Audubon Society Field Guide to North American Rocks and Minerals, Alfred A. Knopf, New York, 1994 and www.merriam-webster.com/

Meeting Information

Time: 2:00 PM
Date: Fourth Sunday of each month (except June, July and August)
Place: Fellowship Hall – Tabernacle United Methodist Church
4329 S. Brannon Stand Road
(intersection of Brannon Stand Road and Hwy 52)
Dothan, AL

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: Tsavorite7@aol.com

Annual Dues

Single $15
Family $20

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Show Chair – Arnie Lambert
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Field Trips Chair – Ken Wilson
850-547-9577

Hospitality Chair – Meredith Capshaw
334-684-9448

Club Hostess – Laural Meints
334-723-2695

Refreshments

SEP – JoAn & Arnie Lambert

OCT – Pat LeDuc & Bruce Fizzell

NOV – To be determined

ROCKHOUNDS HERALD
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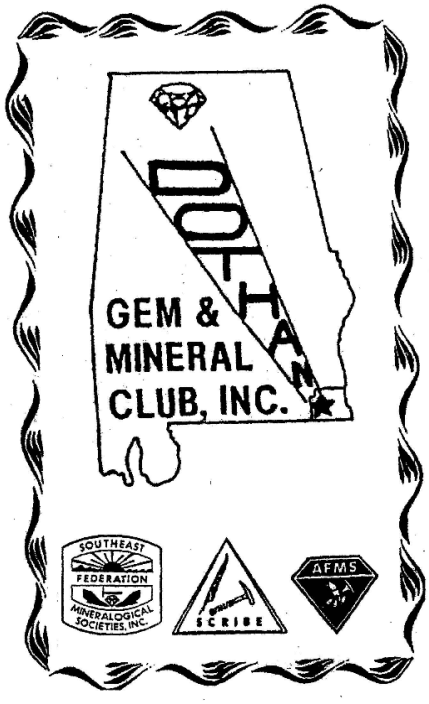

Where you might hear...

Evaporites – chemical sedimentary rocks that result from the evaporation of water containing dissolved solids.

There are two types of evaporate deposits: marine, which can also be described as ocean deposits, and non-marine, which are found in standing bodies of water such as lakes.

Major groups of evaporite minerals are: halides, sulfates, nitrites and borates.

Some common examples of evaporites include: aragonite, apatite, borax, calcite, celestite, dolomite, gypsum, halite, marcasite, pyrite, and sulfur.

Sources: National Audubon Society Field Guide to North American Rocks and Minerals, Alfred A. Knopf, New York, 1994 and www.merriam-webster.com/

http://en.wikipedia.org/wiki/Evaporite

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Southeast Federation of Mineralogical Societies, Inc.
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