The Apache Junction Rock & Gem Club, Inc.

SMOKE SIGNALS

April 2011

Officers of the Apache Junction Rock & Gem Club, Inc.		
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The Club meets on the second Thursday of every month October thru April at 7:00 pm at the Carefree Manor RV Park, at the corner of Tepee & Delaware, Apache Junction, AZ

Club Dues - $24 a year per member prorated to first of month of joining. This may be paid at the general meeting or by mail to Ron Ginn, 691 N. Velero St., Chandler, AZ 85225.

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Next Meeting – Oct 13, 2011

At the Carefree Manor RV Park, at the corner of Tepee & Delaware, Apache Junction, AZ.

Meeting Minutes April 14, 2011

Apache Junction Rock Club General Meeting Minutes for April 14, 2011

1. Meeting was called to order at 7:05 pm
2. Pledge of Allegiance was performed
3. President's comments: Katy announced this will be the last meeting until October. Katy introduced Pamela Wilkinson from the AZ Geological Society as the guest speaker.
4. Winners for the 50/50 tickets are Katy Tunnicliff for March and Pam Saunders for April.

Committees:

Publicity- Wally Frlich

Wally was not present.

Membership and Website- Ron Ginn

We now have 370 active members, 43 of these members do not have email. Ron demonstrated more of the database he created for managing the member database. Ron is checking out websites that can be used for "carpooling" for field trips. Some are quite complicated so he recommended attaching a ride sharing option on our website, but that would require some extensive programming that he would need help with. A member suggested using "Yahoo Group" for getting the information to everyone.

Field Trips- Harry Warren

Harry discussed the upcoming trip. He gave away 8 door prizes.

Lapidary Shop- Brent Staker

Brent reports that the lapidary is staying very busy. He reports that the saws are very busy, during the last 3 months there were 80 members that used the lapidary for a total of 2,557 hours and a total of 6,670 inches were cut on the big saws. Summer hours begin May 1, which will be by appointment only. He announced that Brian and Garth will be alternate monitors for the summer.

Gene Jones made a motion to make the regular monitors be exempt from paying the $70 for their lapidary annual dues since they all put in so many hours. Brent stated that he did not need to make a motion, but was considering this.

Hospitality- Natalie Kirmiel thanked everyone for their continued contributions and brought birthday cake for Katy.

Silent Auction- Mattie Gadd

No report was given at the time of the meeting. However, I do want to let everyone know that the silent auction made $213 for the month of March and $239 for April.

Building chairperson- Sally Stone

No report at this time.

Jewelry & Arts- Dorrie Kapki

No report at this time.

Katy made the motion to adjourn the meeting, Kelly seconded the motion. Meeting was adjourned at 8:15 pm.

Article of the Month

Isinglass

by Andrew A. Sicree

Isinglass and muscovite mica

Not so terribly long ago, in the days before Pyrex®, a baker couldn't look into his oven to see how his bread was baking without opening the oven door. Pot-bellied stoves and high temperature ovens didn't have glass windows because thermal expansion caused the glass to shatter. Modern stoves have windows of Pyrex®, but if an old-style wood-burner had a window, it was made of a mineral: muscovite mica.

The micas are a group of closely related minerals. The mica group includes the common micas, muscovite, biotite, and phlogopite, as well as lesser-known species such as zinnwaldite and lepidolite.

Micas are sheet silicates – that is, the silicate units that make up the mica are arranged in flat sheets, with weak bonds between the sheets. Under stress, these weak bonds are easier to break than are the bonds within the silicate sheets. Thus, micas tend to break (or cleave) into sheets. One can cleave mica into sheets so thin that they are both flexible and see-through. Crystals of mica have been found that were big enough to produce sheets more than two feet square (60 cm x 60 cm).

The term mica is derived from the Latin *micare*, "to shine" and "Muscovy" was used to refer to Russia in general or Moscow in particular. Use of sheets of mica for windows in Russian houses led to the common use of "Muscovy Glass" to refer to sheets of mica. In 1850, the American mineralogist James Dwight Dana, derived the mineral name "muscovite" from "Muscovy Glass" to refer to the particular species of mica commonly used in making windows.

Why is it called isinglass?

Another common term for "Muscovy Glass" is "isinglass." The term "isinglass" is derived from the Middle Dutch term *huusblase*. The *huso* is a large sturgeon and *huus* or *huizen* (sturgeon) + *blas* (bladder) means "sturgeon's bladder." The swim bladder of the sturgeon was used to prepare a gelatin or glue that could be spread out in a thin glassy layer. A sheet of muscovite mica resembles this gelatin, so the term isinglass came to refer to thin sheets of mica (or muscovite mica in general).

Uses of isinglass

Isinglass found use in windows in ovens and stoves because, being a mineral, it would not burn, and it could withstand high heat without breaking. An isinglass window allowed light from a pot-bellied stoves interior to light an otherwise darkened cabin. On naval man-of-war ships isinglass found use as windows, as well. Here the flexibility of mica was a benefit. Under the shock and vibration produced when the ships fired its guns, normal glass would crack and shatter. Isinglass windows would bend and remain intact.

Other uses of mica include use in cosmetics. Finely ground mica serves as a glitter in lipstick, rouge, and eye-shadow. The same principle applies to the use of mica in automobile paint. In paint, flakes of mica reflect light and give the paint a "metallic" look. Ground mica has also been used as a dry lubricant.

Mica is an excellent electrical insulator. Old-style fuses often had mica windows. The mica was a good transparent insulator that wouldn't shatter when the fuse burnt out. Vacuum tubes used mica as a non-conductive substrate to hold the elements of the vacuum tube. (Because of the importance of mica to

the manufacture of vacuum tubes used to radios and radar sets, the U.S. government once built a huge stockpile of isinglass. After solid-state electronic components displaced vacuum tubes in most equipment, the government sold off the stockpile.)

Mica finds use in toasters, and clothes irons. The electric heating elements are wrapped around lightweight "chipboard" made of fragments of mica pressed firmly together. Ancient North America Indians also made use of isinglass. In Ohio, for instance, artisans of the Hopewell culture (100 BC – 500 AD) manufactured an elegant effigy of a human hand out of mica. The uses of this mica effigy (recovered from a burial mound) are unclear, but western North Carolina is thought to be the source of the Indians' mica.

Weird Geology: Rocks that Bend

Think of a rock and you think of something hard and rigid, inflexible. Yet there is a rock that can easily be bent: itacolumite. Also known as flexible sandstone, itacolumite is a true sandstone. The name comes from the town Itacolomi, in southern Minas Gerais, Brazil, where substantial deposits occur.

Typically a fine-grained tan, brown, or yellowish sandstone, itacolumite from Brazil or North Carolina usually displays shiny flakes of mica. Itacolumite from India may be lighter in color, coarser-grained, and show less mica.

Origins of the flexibility

Itacolumite's flexibility is best demonstrated when it is split or cut into long thin strips parallel to the bedding layers. Good quality North Carolina material can be cut into laths more than two feet long, two inches wide, and thinner than one-half inch in thickness. A lath of such dimensions can be bent so strongly that the middle of the lath is displaced more than three inches from a straight line between the ends.

Some debate arises over the origin of itacolumite's flexibility. Mica flakes within the sandstone are oriented parallel to the bedding planes. Because mica is a flexible mineral, these flakes were thought to make the itacolumite flexible. This explanation cannot be complete because other sandstones with mica are not flexible, and some itacolumite has less mica. Also, the flexibility of itacolumite appears to be related to weathering. A bed of itacolumite that is near the surface produces a friable rock that crumbles as it is bent. On the other hand, the deeper a bed of itacolumite lies, the more inflexible it is.

Sandstones require a mineral to glue the sand grains together. Typically this cement is calcite or quartz. Near-surface weathering may lead to dissolution of the cement holding the sand grains together. If only a fraction of the cement is removed, grains can act like hinges. If some sand grains remain cemented together in strings, and the ends of strings are uncemented but trapped by other grains, the strings could function as tiny hinges. The cumulative effect of many of these tiny hinges would be to produce a flexible rock.

Perhaps itacolumite's flexibility is due to a combination of both the presence of mica flakes and the removal of inter-granular cements.

Itacolumite and diamonds

Itacolumite comes from Brazil and India. Early researchers noted that itacolumite was found in association with diamonds. That is, alluvial diamonds in Brazil and India occurred near known deposits of itacolumite. Before the discovery of kimberlite volcanic pipes in South Africa, some geologists believed that itacolumite was the source rock of diamonds.

Although we now know that diamonds can only form in the Earth's mantle, the idea that itacolumite might contain diamonds is not entirely preposterous. It is possible that the sands that formed itacolumite sandstones were deposited downstream from long-ago eroded-away diamond-bearing kimberlites. If so, diamonds could have been caught up in the sandstone. However, no one has yet actually found a diamond in a piece of itacolumite.

In North America, itacolumite is found in North Carolina, South Carolina, and Georgia. Interestingly enough, a few "anomalous" diamonds have been found in a belt stretching across Georgia – in the same area in which itacolumite occurs.

Why are stalactites brown?

Take a cave tour. Ask the guide a simple question: "Why are these cave formations brown?" Typically, your guide will pipe up and answer, "Oh, they're brown because of iron staining from the groundwater." Sounds like a reasonable explanation? After all, we've all seen rust stains on concrete sidewalks or white shirts.

But brown stalactites are a case in which common wisdom is incorrect.

Stalactites, and other cave formations such as stalagmites, dripstones, and flowstones, are typically built of calcium carbonate. Pure calcium carbonate, whether in the form of the mineral calcite or the mineral aragonite, should be snow white. Yet cave formations, or speleothems, often are brown, tan, or yellowish-brown.

One clue to the mystery of brown-coloring is provided by the fluorescence of speleothems. A simple experiment you can do yourself casts some "light" on the problem. The next time you are in a cave, and your guide turns out the lights to show you what total darkness looks like, you can conduct a simple experiment (you might want to ask your guide for permission first). In the dark, hold your camera flash up to a cave formation and then close your eyes tight. When everyone has their eyes closed tight and is looking away, trigger the flash unit. After the flash goes off, quickly open your eyes and look at the cave formation. In the dark, you'll see a glowing white patch where you held the flash. This white phosphorescence is common in cave formations.

This is a clue. If the speleothem were full of iron oxide it wouldn't phosphoresce. Iron oxides tend to block or "quench" fluorescence.

The white phosphorescence you observe is caused by fulvic acids and related compounds incorporated into the calcium carbonate speleothems. Fulvic acids are large molecules (macromolecules) composed of hundreds or even thousands of atoms. Mostly carbon, oxygen, and hydrogen, fulvic acids are the result of decomposition of organic matter (primarily plant debris) in the soil horizons above the cave. Descending groundwater carries fulvic acids and dissolved calcium carbonate into caves. When a droplet of groundwater deposits a bit of calcium carbonate on a cave formation, traces of fulvic acids will also be caught up in the formation.

One important characteristic of fulvic acids is that they don't have a nice neat single chemical structure. Slight differences exist between one fulvic acid molecule and the next. These differences aren't great – the different molecules all still behave pretty much the same – but they can cause slight differences in the color of the fulvic acids. Thus, the color of a bunch of fulvic acid molecules is really the result of the combination of a wide array of colors. What color do you get when you mix a bunch of colors of paint? Brown! What is the color of a bunch of fulvic acid molecules? Brown!

The same array of slight differences in fulvic acid molecular structures that gives you a brown color also gives produces a white fluorescence. Recall that a mixture of lights of all different colors gives you white light, while a mixture of paints of all different colors produces a brown color. When slightly different molecules are hit with ultraviolet light (and most camera flashes produce some ultraviolet light as well as visible light), they fluoresce slightly different colors. All these colors of light combine to make a speleothem glow with a white light.

Ref.: White, W. B. and Brennan, E. S., 1989, Luminescence of speleothems due to fulvic acid and other activators, Proceedings of the 10th International Conference of Speleology, August 13-20, 1989, Budapest, 1: 212-214.

Rock Shows in May

May

May 14-15, 2011 Fountain Hills

2nd Annual Fountain Hill Gem & Mineral Show

Fountain Hills Community Center,
13001 N. La Montana Dr., Fountain Hills, AZ 85268
Sponsored by: O.B. Rock & Minerals, 602-826-2218
Admission and parking: Members wearing a badge get in for $1. $2 admission, children under 10 free
Hours: Sat. 10-5, Sun 10-4
Raffles, Drawings, Kids Activities

May 28-29, 2011 Pinetop-Lakeside

Memorial Day weekend

White Mountain Gem & Mineral Show

Blue Ridge J.H., 3050 N. Porter Mtn. Rd., Lakeside, AZ 85929
Sponsored by: White Mt. Gem & Mineral Club
P.O. Box 3504, Show Low, AZ 85902
Admission: $2.00, students under 16 free with paying adult.
Parking: Free
Hours: Sat. 9-6, Sun. 9-4
Show and Dealer Chairperson: Larry Legge larrylegge@yahoo.com & Nanz Marshall, 928-537-2524

May 28-29, 2011 Bisbee

Bisbee Mineral Show

Sponsored by: City of Bisbee, Bisbee Mining Historical Museum, and Bisbee Chamber of Commerce
Hours: Sat., Sun., 9-5
Website: www.queenminetour.com
Phone: 520-432-2071

NOTE:

The following businesses bought advertising in our show fliers. Please give them your business, if appropriate, in appreciation for their support:

Mickey D's Cafe
1408 W. Apache Trail, AJ

AZ Bead Depot
300 W. Apache Trail, AJ

Dreams & Legends Gallery
2260 N. Apache Trail/Hwy 88, AJ

Promack Treasure Hunting
2204 W. Apache Trail, AJ

Sticks & Stones
1408 W Apache Trail, AJ

Apache Junction News
115 N. Apache Trail, AJ

Hutsell's Apache Junction RV
1880 W. Apache Trail, AJ

The Jewelry Menders
2041 W. Apache Trail, AJ

Solid Rock Supply
7155 E. Main St., Mesa

Patterns of the Past
300 W. Apache Trail #101, AJ

Mirage Sports Grill
1075 S. Idaho Road, AJ

Superstition Realty
115 N. Apache Trail, AJ

Natural Expressions, Inc.
13802 E. Williams Field Rd, Gilbert

Hitching Post
2341 N. Apache Trail, AJ

LifeGate Church
565 W. Apache Trail, AJ