The Apache Junction Rock & Gem Club, Inc.

SMOKE SIGNALS

January 2012

Officers of the Apache Junction Rock & Gem Club, Inc.		
President:	Katy Tunnicliff	918-440-9152 katydidnt2007@gmail.com
Vice-President:	Jerry Gervais	480-252-2456
Secretary:	Barbara Bayer	480-832-3561
Treasurer:	Mattie Gadd	503-705-3933 mmpdg16@msn.com
Trustee:	Jack Pawlowski	480-288-2642 j6ac5k@calcon.net
Trustee:	Brian Fermoyle	480-983-2003
Trustee:	Tom Sundling	402-432-9790

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.

In This Issue

Next Meeting – Feb 9, 2012

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

General Meeting Minutes

Apache Junction Rock Club General Meeting
Minutes for January 12, 2012

The meeting was called to order by the President at 7:10 pm. She led the Pledge of Allegiance.

- The secretary's December report was accepted as circulated.
- No report from the treasurer.
- Wally Frlich of the Advertising committee circulated lists for volunteers for our February 18-19 Mineral Show which will be held at Skyline High School. Volunteers are needed for the following: set up team, greeters, Ming tree activity, raffle, silent auction, wheel activity, door monitors, entry table, and take down team. Volunteers are set for the trailer and announcer. Mr. Frlich thanks the members who distributed coupon tickets at the Flagg Mineral Show in Mesa.
- Ron Ginn of the Membership committee reported that we have 410 members, 13 life members, and 81 members have renewed their membership. The following are new members: Paul Ewald, Linda Ewald, Rusty Farrell, Dan Fortney, Joseph Gerber, Jeanne Gerber, Mona Lane, Tom Miller, and Alex Phelan.
- Phil Gadd reported that the Lapidary shop has all grinders and saws in good condition. The monitor schedule is on our Website. The schedule also includes hours until 7 pm on Tuesdays and Thursdays.
- Kelly Iverson reported that tables for the February show have been ordered and security for the show has been arranged.
- Kelly Iverson requests that if you are not receiving the newsletter via email, please contact Ron Ginn so a copy can be mailed to you.
- Natalie Kirmel of the Hospitality committee thanks all for the December holiday pot

luck. She also found a glass dish cover after the dinner.

- Building committee- no report

Our speaker Carleton Moore, a Regents' Professor from Arizona State University and former Director for Meteorite Studies presented "Meteorites". He displayed a collection of various types of meteorites.

Field trips planned by Terri Creiglow:
1-14 Hewitt Marble, Meet at AJ Walmart at 8 am
1-21 Sycamore Creek, Meet at AJ Walmart at 8 am
1-28 Seven Springs for onyx, Meet at the McDonalds at Frank Lloyd Wright and 101 Freeway at 8 am
2-04 Seneca Lake for Serpentine, Meet at the McDonalds in Globe at 8 am

The equipment auction was held with the following sales: Trim saw $55, three tumblers sold for $30, $48, and $30, plus a 10" slab saw $300. The silent auction was then held. We thank our auctioneer. Tobia Eaks was the winner of $65 from the 50/50 activity.
The meeting was adjourned at 8:40 pm. Submitted by Barbara Bayer, secretary

Submitted by Barbara Bayer, secretary

Article of the Month

Pegmatites: The Mineralogical Mother Lode

by Andrew A. Sicree

Pegmatites and the collector

The mineral collector often hears the term pegmatite, and a novice may mistakenly think that pegmatite is a species of mineral to be collected. However, pegmatite is a type of rock, not a single mineral. Feldspars, quartz, and micas are the major mineral constituents, thus pegmatites are compositionally similar to granites. Pegmatites are coarse-grained igneous rocks. Mineral grains in a pegmatite are typically about one-half inch (about 1 cm) across or much larger. Coarseness of the crystal grains in a pegmatite is a major distinguishing characteristic. One can think of them as very coarse-grained granites.

Mineralogically, pegmatites are the mother lode of interesting minerals, especially silicates. In addition to a variety of feldspars (such as albite, amazonite, etc.), there are micas (muscovite, phlogopite, biotite, lepidolite), and quartz varieties (smoky and rose quartz). Garnets, particularly grossular and almandine, occur, as does spodumene, beryl, topaz, and tourmaline. And, depending upon the type of pegmatite, a host of other unusual minerals such as columbite, tantalite, niobite, and uraninite may also be found.

The world's largest crystals

Pegmatites have produced the world's largest crystals. For instance, the largest crystal on record is an immense crystal of microcline feldspar encountered at the Devils Hole Beryl Mine in Fremont County, Colorado. This microcline was about 162 feet long by 118 feet high and 45 feet deep (49m x 36m x 14m) weighing an estimated 17,500 tons (15,900 metric tons). Another large crystal was a phlogopite mica from the Lacy Mine in Ontario, Canada, that was 33 feet long (1000 cm) and 14 feet (430 cm) in diameter.

Large crystals form in pegmatites because of low rates of nucleation (meaning that only a few crystals start to grow rather than many crystals at once) and high rates of diffusivity (meaning that the elements needed to keep a crystal growing can rapidly move through the fluid phase to the crystal).

Origins of pegmatites

The origins of pegmatites are a topic of continued debate. Some pegmatites appear to have formed from the partial melting of rocks subjected to intense metamorphism. Many pegmatites are associated with large intrusions of granite and may have formed when the granitic magma cooled to the point at which it became saturated with water. Then, under high temperatures and pressures, pegmatite minerals grew from a fluid consisting of silica, water, and other dissolved elements. Other pegmatites probably were not produced during water-saturated granite crystallization.

Pegmatites occur as dikes or lens-shaped bodies that appear to have been injected into the surrounding rocks. Typically,

pegmatites are zoned. Minerals nearest the exterior of the pegmatite are smallest while those in the interior get progressively larger as one approaches the center. The largest crystals are found near the center of a pegmatite (a useful bit of knowledge if one is searching for large crystalline specimens). In addition to the more common elements silicon, aluminum, oxygen, sodium, potassium, etc., which make up feldspar, micas, and quartz, pegmatites can carry a host of other less common, even rare, elements. Beryllium, lithium, boron, zirconium, tantalum, niobium, tin, tungsten, cesium, cerium, thorium, and uranium are found in pegmatites. As a pegmatite cools, rare elements tend to become concentrated in the fluid phase and precipitate out late in the cooling history. Thus, unusual minerals, such as those containing uranium, tantalum, or the rare earth elements, may form in pegmatites.

No two pegmatites are exactly alike, but it is possible to group various pegmatites according to shared characteristics. Several classification schemes exist. One way to classify pegmatites is by their elemental assemblages. Thus, we recognize niobium-yttrium-fluorine and lithium-cesium-tantalum families of pegmatites. These families are thought to combine groups of pegmatites with similar origins.

Economic importance

Some pegmatites can be exploited commercially. As noted above, large, even huge, feldspars are common in pegmatites. Feldspar finds use, for instance, in ceramics, dentistry, and as a scouring agent. Large sheets of mica or isinglass can be culled from some pegmatites, and large amounts of quartz are produced, especially smoky quartz and rose quartz.

Pegmatites are an important source of the rare earth elements and niobium and tantalum. Most of the world's beryllium comes from pegmatite beryls. They are also the most important source of lithium, which is found in the minerals lepidolite (the lithium mica), lithiophyllite, or spodumene.

Gemstones are also found in pegmatites. Large tourmalines, topazes, and gemmy beryls occur near the centers of some pegmatites. Single gem-quality topaz crystals more than two feet (60 cm) long and one foot (30 cm) in diameter can be found. Beryls may occur as the morganite or aquamarine varieties. Gem-quality apatites, fluorites, and smoky quartzes are recovered from pegmatites, too.

The Color of the Rose

Rose quartz is pink, but its pink color is distinctively different than that of other pink minerals (such as morganite or rhodonite). In addition to its delicate pink color, rose quartz displays a definitive hazy translucence. While gemmy pieces that can be cabbed or even faceted occur, it is impossible to find one that is completely transparent.

If you take rose quartz, and etch it with HF (hydrofluoric acid, a very nasty chemical that attacks and dissolves glass and quartz), you will find that when the quartz is dissolved away a matte of fine pink fibers remains behind. These fibers are fine enough (about 0.1 to 0.5 microns in diameter) to qualify as "nano-fibers." The color of these fibers is the color of rose quartz – so it appears most likely that they are the source of both the pink color and the characteristic translucence.

Analysis of these fibers shows them to be an aluminum borosilicate mineral that is very similar to *dumortierite*. Dumortierite ($Al_7(BO_3)(SiO_4)_3O_3$, orthorhombic) is an aluminum borosilicate that occurs in fibrous to columnar aggregates and is usually blue to purple in color. Pink dumortierite also occurs. The color may be determined by traces of titanium or iron.

When we note that the fibers are "similar" to dumortierite, we are saying that although they are close to dumortierite in both composition and structure, they aren't exactly the same. The major difference appears to be the fact that iron substitutes for some of the aluminum atoms. Thus, although it might be a separate mineral, whether or not the difference is sufficient enough to qualify as a new mineral with its own name is a matter yet to be decided by the experts.

Rose quartz is found at many locations throughout the world. For instance, in the Black Hills of South Dakota, it occurs in pegmatites.

Down the Amazon

Amazonite is a beautiful blue-green variety of feldspar and an excellent example of what mineralogists call a *perthite*.

The feldspars are a group of related aluminosilicate minerals, most of which contain sodium, potassium, or calcium. The sodium-

calcium feldspars are called *plagioclase* and they range from the pure sodium feldspar (*albite*) to the pure calcium feldspar (*anorthite*). In between these two end-members we find the minerals *oligoclase*, *andesine*, *labradorite*, and *bytownite*. Above about 700ºC, there likewise is a continuous series between the sodium and potassium end-members, that is, between albite and "K-spar" ("K-spar" stands for "potassium feldspar" which is typically *orthoclase* or *microcline*). At lower temperatures, there exists a "miscibility gap," such that that the series is not continuous.

What this means is that, if one starts out above 700ºC with a single feldspar crystal that is intermediate between albite and K-spar, and then cools the crystal slowly, you will find that your nice single crystal segregates itself into two minerals. One will be albite and the other will be K-spar. The term *perthite* is used to describe the result. Perthite is an intergrowth of albite and K-spar. Typically, one gets a host grain of K-spar with irregular or thin plates (or *lamellae*) of albite slicing through it.

Amazonite is a perthite. Careful examination reveals that the green feldspar is cut through by thin sheets of fine white material. This white mineral is the sodium-rich feldspar, albite. The green feldspar is the potassium-rich K-spar.

The color of amazonite was once attributed to copper, but more recent studies indicate that it is due to traces of lead and water absorbed into the structure of the K-spar.

Ref.: Hoffmeister, Anne M., and Rossman, George R., 1985, "A spectroscopic study of irradiation coloring of amazonite: structurally hydrous, Pb-bearing feldspar," *American Mineralogist*, v. 70, p. 794-804.

MINERAL DEFINITIONS

***Framboid*:** Comes from the French *framboise* or "raspberry." Under the microscope, in shales, one may observe tiny aggregates of pyrite grains – they look like tiny raspberries, hence the name.

***Cryptocrystalline*:** When a rock such as flint is made up of crystals that are so small that they cannot be distinguished even under an ordinary microscope, the texture is said to be cryptocrystalline.

Ref.: *AGI Dictionary of Geological Terms*

Rock Shows in January

GILA VALLEY GEM & MINERAL SHOW
Jan 20 th 22 @ the Gill
A the Gila County Fairgrounds
US60 east of Globe
Hrs: Fri & Sat 9 to 5, Sun 10 to 4

Thanks to the following members who helped to distribute approx. 1550 discount coupons for the rock show at the Flagg Show the weekend of Jan 6 th 8:

David and Barbara Bayer
Katy Tunnicliff
De Witt Wright
Bill Stasi
Claude and Cindy Koontz
Margie La Vigne
Pam Saunders
Tobia Eaks
Richard and Jeanette Porrett
Tom and ConnieSundling
Natalie Kirmel
Pat Wallace
Norma Norwood

Also, Kelly Iverson who distributed 1400 coupons to the various dealers at the Flagg Show that also will be at our show.

Field trips planned

1-14 Hewitt Marble, Meet at AJ Walmart at 8 am

1-21 Sycamore Creek, Meet at AJ Walmart at 8 am

1-28 Seven Springs for onyx, Meet at the McDonalds at Frank Lloyd Wright and 101 Freeway at 8 am

2-04 Seneca Lake for Serpentine, Meet at the McDonalds in Globe at 8 am

Safety Tips for Winter Field Trips
Barbara Brillhart RN PhD FNP-BC

Field trips for mineral specimens allow for multiple benefits which include the minerals, the beautiful Arizona scenery, fresh air, exercise, and fellowship. To enjoy the field trips to the upmost, the following safety measures are important.

1. Carry a cell phone with a full battery charge (cell phones may not work in off road locations).
2. Plan the trip using current road and topographic maps or a GPS.
3. Carry a compass
4. Tell others where you plan to hike and the length of the hike.
5. Keep your vehicle in good shape with attention to the battery, tires, radiator, defrosters, antifreeze, windshield wipers, and oil level.
6. Skid plates applied under your vehicle can protect oil pan etc. from desert rocks.
7. Have adequate fuel in the car/truck.
8. Carry beverages and food, as energy bars (consider several day supply).
9. Carry blankets or a sleeping bag and a tarp (tarp for shelter and rain protection also to signal your location).
10. Have clothing for unexpected cold temperatures as coats, sweaters, hat, gloves, scarf, and warm footwear.
11. To prepare for snowy conditions, use snow chains or tires, plus have shovel and cat litter available.