The Apache Junction Rock & Gem Club, Inc.

SMOKE SIGNALS

Jan 2011

Officers of the Apache Junction Rock & Gem Club, Inc.		
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Trustee:	Brent Staker	480-298-1359 gbstaker@yahoo.com
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 - $10 per new member. Renewals are $10 per member. 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 17, 2011

The room is NOT AVAILABLE to us on the 10th. 7:00 pm at the Carefree Manor RV Park, at the corner of Tepee & Delaware, Apache Junction, AZ.

NOTE:

If you haven't paid your dues by Jan 31, you will be removed from the active membership list and will no longer be receiving the newsletter or be eligible to go the rock trips or use the shop.

Meeting Minutes Jan 13, 2011

Apache Junction Rock Club General Meeting
Agenda for January 13, 2011

1. President, Katy Tunnicliff called the meeting to order at 7:15 pm.

2. Pledge of Alliance was then performed.

All Officers and trustees were present for the meeting.

Committees:

Publicity- Wally Frlich: spoke in great detail of our upcoming annual rock show at Skyline High School on February 19 and 20th. There were 1500 discount admission coupons handed out at the "Flagg" Show. These were handed out by Richard & Jeanette Porrett, David & Barbara Bayer, Ken & Lois Perkins, Brent Staker, Natalie Kirmiel, Katy Tunnicliff, DeWitt Wright and Oma Frlich, a big thank you to all of them. We also want to thank the businesses that support our club Sticks and

Stones, Promack Mining, Solid Rock, A & B Gold and AZ Bead Depot. All members not working at the annual show has free entry if they wear their name tags. We still need members to sign up for various duties, i.e. Wheel of Rocks, raffle tickets, admissions (need 3 people at a time), door security, set up and tear down. Harry will do the silent auction, DeWitt will bring the trailer of supplies to the school, Jim will be the announcer and still need help with the ming trees; clipboards with sign up sheets were passed around. There are flyers and additional coupons to hand out, please sign up to help.

Membership and Website- Ron Ginn: There are a total of 352 members, 23 new members were signed up tonight.

Newsletter - Kelly Iverson: nothing new with the newsletter. It is posted online every month.

Field Trips- Harry Warren: Harry talked in detail regarding the upcoming trip on Saturday to Barry Goldwater Range. You will need to have a permit to attend this field trip, these permits are free and can be obtained from BLM. The next trip will be on Jan 22 to collect Purple Sagenite and Jan 29 trip to Brenda will be for Jasper. Harry had a drawing for some rock specimens, all 15 winners were pleased with the prizes.

Hospitality- Natalie Kirmiel: wanted to thank everyone who helped with the Christmas potluck. We had a great turnout for the Christmas dinner.

Lapidary Shop- Brent Staker: There were 81 members that used the lapidary last year. Brent wants to thank all the monitors for their time and help of running the lapidary. A display board with pictures of the lapidary was on display for new members to see how nice the lapidary is and encourage them to use it.

Rock Art Show-Rick Grzych It was reported that we had 900 visitors at Dreams and Legends on the date of our last show on December 18 & 19, 2010. We signed up several new members and DeWitt was kept busy with the 10 inch and trim saw. Everyone had a good time. The next Rock Art Show will be on January 29 & 30, 2011.

Speaker-Joe Soerce of Sticks and Stones attended our meeting. He will give a discount to all club members, so remember to wear your name tags when shopping in AJ.

A club member asked if the club is working on getting our own place for a lapidary so we can expand. The trustees are working on a 5 year plan to present a proposal to the club.

Meeting was adjourned at 8:35 pm by Katy Tunnicliff and was seconded by Jerry Gervais.

Minutes are submitted by Mattie Gadd, secretary.

Article of the Month

One element, two colors

Ruby. Emerald. One is red, the other green. But both derive their vibrant colors from the same element: chromium.

Ruby is the red variety of the mineral *corundum* (hexagonal aluminum oxide, Al_2O_3). Blue sapphire is another variety of corundum. Yellow gems occur as well, but in its purest state corundum is colorless or white. The rich luminous red color of ruby is due to an impurity within the aluminum oxide crystal structure. Traces of chromium (as chromic ion, Cr^{3+}), replace aluminum (Al^{3+}). In ruby, about one atom of aluminum per hundred is replaced by a chromium.

What is the effect of this small amount of Cr^{3+}? When white light (which, you will recall, is composed of red, orange, yellow, green, blue, and violet light) passes through a ruby, violet light is strongly absorbed along with green-yellow light. Blue light and red light are transmitted. Transmission of red, however, is much stronger than that of blue, so the ruby looks red. Ruby's particularly rich red color comes from this strong red transmission, enhanced by a little bit of blue.

Fluorescence of ruby

Rubies look even better outdoors. There is a fraction of ultraviolet light in natural sunlight and the luminous glow of a cut ruby outdoors results from a red fluorescence which is, coincidentally, almost identical to its red color. In the dark, under an ultraviolet lamp, rubies will fluoresce a beautiful red. In 1960, this fluorescence was utilized by Theodore

H. Maiman at the Hughes Research Laboratory in California to make the world's first laser. Maiman's laser was constructed using a rod of ruby with silver-coated ends; it was "pumped" (powered) with a high-intensity xenon flash lamp. Xenon flash lamps produce a bright pulse of both ultraviolet and visible light. The first laser used ruby's red fluorescence to produce its red beam of light.

Rubies are red, emeralds are green

"Okay," you say, "but if chromium gives us the red color in ruby, how can it give us a green color in emerald?"

Emerald's color is so distinctive that only the term "emerald green" describes it well. Emerald is a variety of the mineral *beryl*, $Be_3Al_2Si_6O_{18}$. Like pure corundum, pure beryl is also colorless. (Natural colorless beryl is sometimes called *goshenite*, after the town of Goshen, Massachusetts, one locality for the variety.)

As in ruby, the green color in emerald is due to chromium impurities. The chromic ion, Cr^{3+}, replaces aluminum (Al^{3+}) in the mineral's structure in a manner very similar to that in ruby. But slight differences in the bond strengths between ruby and emerald lead to slight shifts in the absorption and transmission bands. Violet light is still absorbed but the green-yellow absorption band of ruby shifts to absorption of yellow-red light in emerald. This diminishes the transmission of red light so that the transmission of blue-green light (corresponding to the weak transmission blue light in ruby) is now strongest and becomes most important in determining the color of the emerald.

Like ruby, emerald fluoresces red under ultraviolet light. If iron is present in either, the fluorescence is quenched (i.e., doesn't fluoresce).

The alexandrite effect

Drastic differences in color occur from the introduction of chromium impurities into beryl or corundum. What happens when chromium is present as an impurity in other minerals? *Chrysoberyl* is $BeAl_2O_4$ and is colorless when pure. Add a trace of chromium and chrysoberyl becomes the *alexandrite* variety. When chromium is present as an impurity, the resulting bond strengths are intermediate between those in ruby and emerald. The result is a mineral in which the blue-green transmission band closely matches the red transmission band in intensity. So what color is chromium-rich chrysoberyl? Is it the red of ruby or the green of emerald? It turns out that the color of alexandrite depends upon the light shining upon it. Sunlight and fluorescent tube light are both rich in blue-green light. On the other hand, incandescent light (such as that coming from normal light bulbs with tungsten filaments) and candlelight are rich in red light. Shine an incandescent light on alexandrite and the stone appears deep red in color akin to ruby. Put the stone under a fluorescent bulb or carry it outdoors and it shows a blue-green color somewhat similar to emerald. This color change is known as the *alexandrite effect* and it shows up in a few other minerals such as monazite from near Badin, Montgomery County, North Carolina, which is light green under fluorescent light, yellow-orange in daylight, and reddish-orange under incandescent light (cf. "Monazite from North Carolina having the alexandrite effect" by Lawrence R. Bernstein in *The American Mineralogist*, 1982, v. 67, p. 356-359).

Note: The term alexandrite effect originally referred stones that showed a shift from greenish color to reddish color when moved from sunlight to incandescent light (cf. "The Alexandrite Effect: An Optical Study" by William B. White, Rustum Roy, J. MacKay Crichton in *The American Mineralogist*, 1967, v. 52, p. 867-871). But it has come to be used for all types of color changes resulting from different light sources. For instance, the term is used for pyrope garnets from the Gates-Adah kimberlite dike in Fayette County, Pennsylvania, that are pinkish-purple or raspberry-colored under incandescent light and bluish- to greenish-gray under fluorescent light (cf. "Blue Gray by Day and Pinkish Purple by Night: Pennsylvania's Pyrope Garnets" Robert C. Smith and John H. Barnes, *Pennsylvania Geology*, 2006, v. 36, no. 4, p. 4-12).

Is Chromium Good for You?

One curious fact about the element chromium is that it is both a poison and a nutrient. Many mineral nutrients are toxic if administered in too large a dose. But for chromium the difference between toxicity and nutrition depends upon its chemical valence. Trivalent chromium(III) is thought to be required by humans in order to metabolize sugars. But the hexavalent chromium(VI) is toxic and carcinogenic. - *A.A.S.*

The Discovery of Chromium

Born in Langenhennersdorf, Saxony, in 1719, Johann Gottlob Lehmann was a German mineralogist and geologist who played an important role in the discovery of chromium. Originally educated as a doctor, Lehman taught mining and mineralogy in Berlin, then moved to St. Petersburg, Russia, where he became director of the Imperial "cabinet" (the museum) and studied ores. In 1761, Lehmann discovered an orange-red mineral at the Beresof mines in the Ural Mountains that he called "Rotbleierz" ("red lead"). Unfortunately, he

misidentified it as a compound of lead, with "selenitic spar," and iron. Lehman died in 1767 in a chemical explosion without knowing that his orange-red mineral was really a chromate of lead: the mineral we now call *crocoite* ($PbCrO_4$).

In 1770, the German zoologist Peter Simon Pallas (1741-1811) visited the Beresof mines and encountered the same "red lead" mineral. He noted that it crushed to yield a beautifully strong yellow powder and that this powder could be used as a pigment. Mining of "red lead" for paint pigments commenced and the bright yellow color of Siberian red lead became fashionable, used to paint carriages of the nobility in England and France.

Vauquelin gets chromium from crocoite

A French analytical chemist, Louis Nicolas Vauquelin (1763-1829), received samples of crocoite ore in 1797. Vauquelin reacted the ore with hydrochloric acid to generate chromic oxide, and, in 1798, reduced chromic oxide to chromium metal in a charcoal oven. He gave chromium its name from "khrôma," the Greek word for color, appropriate for a new element derived from brilliantly colored crocoite and used to such good effect as pigment. Further investigations by Vauquelin detected traces of chromium in ruby, chrome mica, and emerald.

In the following year, chromium was discovered in the black chrome iron spinel mineral now called *chromite*, $(Fe,Mg)Cr_2O_4$. Chromite, found in the Urals, in France and, in 1827, along the boundary between Pennsylvania and Maryland, greatly increased the world supply of chromium. Crocoite was no longer the only source of chromium. Pennsylvania-Maryland chromite deposits dominated the world trade in chromium from the 1830s until the U. S. Civil War. As the Pennsylvania-Maryland chromite mines played out, mines near Bursa in Turkey came to the forefront. Turkey remained the world leader in chromium production until the early 1900s when chromite production began in India and South Africa.

Although still used in making pigments, chromium began to be used in other applications in the late 1800s and early 1900s. Chromium compounds were used in tanning leather, in making refractory bricks, and in the manufacture of stainless steel.

Chromite is the major source

Today, South Africa dominates world production of chromium. South African mines exploit chromite-rich horizons in the huge Bushveld layered igneous intrusive complex (an unusual type of igneous rock that is also the source of South Africa's platinum). Most chromite is not smelted to produce pure chromium metal. Rather, smelters produce a master alloy, *ferrochromium* (a mixture of iron and chromium), that is then added to iron during the manufacture of chrome steels such as stainless steel. *– A. A. Sicree*

Meteorite Meets Meteorology

An F5 tornado is a bad as it gets. On the evening of May 4th, 2007, a tremendously powerful F5 tornado razed the city of Greensburg, Kansas, and nearly destroyed one of America's most famous meteorites.

The May 4th Greensburg tornado (rated EF5 on the new, Enhanced Fujita scale) destroyed 95% of the town and killed at least 10 people. Winds hit up to 205 mph. Greensburg is famous for two reasons: it is home to the Big Well, reputedly the world's largest hand-dug well, and it houses a 1000-pound chunk of the Brenham pallasite. A pallasite is a rare stony iron meteorite consisting of bright green olivine crystals in a matrix of nickel-iron metal. The Brenham pallasite was housed in the Big Well Museum in Greensburg.

When the Big Well Museum was destroyed by the tornado, the meteorite also passed through the storm. In the immediate aftermath, it was reported that the pallasite was missing. Fortunately, the meteorite was later found intact, buried under debris at the site. *A.A.S.*

What is a pallasite?

Say the word meteorite, and most people picture a black mass of solid iron streaking through the sky, plummeting to earth. But not all (or even most) meteorites are solid metal. Although some meteorites are masses of nickel-iron metal, many others are mostly stony. And there are other, intermediate types. The *pallasite* is one rare type of stony-iron meteorite.

Cut through a pallasite and an unusual texture is revealed: picture Swiss cheese made of silvery metal with its round air holes filled with emerald. While pallasites do not really contain emeralds, they do have centimeter-scale round green blebs of gemmy olivine

crystals (the peridot variety) in a matrix of nickel iron. Mineralogically, olivine is a group of iron magnesium silicate minerals that occurs as a continuous series ranging from forsterite, Mg_2SiO_4, to fayalite, Fe_2SiO_4.

Nickel-iron (or iron-nickel) is an alloy of iron with some nickel. Nickel-iron is an intergrowth of two minerals: kamacite and taenite. Kamacite is the lower-nickel phase, called alpha-(Fe,Ni). Taenite is the higher-nickel phase, gamma-(Fe,Ni). Pallasites

may also contain blebs of schreibersite, a rare iron nickel phosphide mineral, or the sulfide mineral troilite (FeS).

One theory about the formation of pallasites is that they're remnants of the core-mantle boundary of a large differentiated asteroid. By differentiated, meteoriticists mean that the interior of the asteroid was segregated into a metal-rich core surrounded by a rocky mantle. A tremendous collision with another asteroid ripped open the pallasite parent asteroid and fragments of the core-mantle boundary rocks were scattered into space. Some of these fragments found their way to the Earth to land as pallasites.

The pallasites are named for Peter Simon Pallas (1741-1811), a German zoologist. In 1776, Pallas was the first to describe a pallasite. He found a 680 kg mass of stony-iron near Krasnojarsk in Siberia. The Krasnojarsk pallasite is thus the type specimen.

Interestingly, in the 18th Century, few scientists believed that rocks could fall from the sky. And many clergymen believed that such falls were indeed possible – this was one case in which the scientists were wrong and the religious leaders correct.

Pallas' Krasnojarsk specimen played a key role in convincing scientists that rocks could indeed come from outer space. In 1794, Ernst Florens Friedrich Chladni (1756-1827) published a description of Pallas' Krasnojarsk specimen titled *On the Origin of the Pallas Iron, and Others Similar to It…* Chladni argued that meteorites had extra-terrestrial origins and based his argument on the fact that while Pallas' was unlike any other rocks or ores near where it was found, it was similar to other metal specimens found great distances away. At 680 kilograms (1496 pounds) the Krasnojarsk specimen was too heavy to have been carried to the location where it was found in Siberia.

Although ridiculed by scientists, Chladni's theory of extra-terrestrial origin of meteorites received serious support when Jean-Baptiste Biot (1774-1862) investigated the 1803 meteorite fall at L'Aigle in France. Biot's report of eyewitness evidence to the L'Aigle fall was critical to convincing many scientists of the reality of meteorite falls. Incidentally, the mica mineral *biotite* is named for Biot.

Field Trips in Jan

The Goldwater Range trip was a great success. There were 23 vehicles with 54 persons. A long ride thru the desert and several washes with only 4 flat tires.

22. Sheep Crossing a Saturday to get purple sagenitic agate or sagenite and it can be the best in the country but the road has made it one of the most remote sites in Arizona. We go by way of 7 Springs on FR24 to Bloody Basin and beyond. Details later. (4x4)

26. A Wednesday the Quartzite Club has a claim on this spot so we try to stay clear of it. This is the brightest red and white jasper that you will ever find. We must go on a myriad of trails every time we go there and it was a miracle that we ever found this place a few years ago. We give no maps and play follow the leader in caravan. Details later.

If you are a real rock hound, then you will make at least one of these trips and let us start the new year out right. Harry at rockharry@netscape.com

Rock Shows in January & February

January/February

January 1 - February 28, 2011 Quartzsite
Desert Gardens Intl. Rock & Gem Show
P. O. Box 2818, Quartzsite, AZ 85346
1155 Kuehn Street, ¼ mile east of exit 17
Hours: 9-6
Admission and parking: Free
Dealers Contact: Sandi McAllister, 928-927-6361
Website: www.desertgardensrvpark.net
E-mail: dggemshow@ureach.com

January 21-30, 2011 Quartzsite
Tyson Wells Sell-A-Rama, Rocks, Gem-Arts-Crafts. Tyson Wells Show Grounds,
SW Corner of I-10 Freeway and
Highway 95, Quartzsite, AZ
Website: www.tysonwells.com
Admission: Free
Show Chairperson: Kym Scott (at address below)
Dealers Contact: Tyson Wells Sell-A-Rama, P.O. Box 60, Quartzsite, AZ 85346, 928-927-6364 (mail 6-8 months ahead)

January 19-23, 2011 Quartzsite
Pow Wow Gem & Mineral Show
Located in the center of town on Mesquite &

Ironwood Drives, Quartzsite, AZ
Website: www.qiaaz.org
Sponsored by: Quartzsite Improvement Assoc.
Dealers Contact: Donna Hiller, P.O. Box 881, Quartzsite, AZ 85346-0881, 928-927-6325, Fax, 928-927-4503
Admission and parking: Free

January 27 – February 12, 2011 Tucson
22nd Street Mineral, Fossil & Gem Show
600 22nd St. & I-10, Tucson
Hours: 9-7
Admission and parking: Free
Website: www.22ndstreetshow.com
Sponsored by: Eons Expositions
Dealers Contact: Christine at (516) 818-1228
Email: lowellcarhart@yahoo.com

January/February

For a listing of the satellite Tucson shows that run from January through February 2011:
Website: www.tucsonshowguide.com or www.VisitTucson.org

February

February 4-13, 2011 Quartzsite
Tyson Wells Arts and Crafts Fair
P. O. Box 60, Quartzsite, AZ 85346, 928-927-6364, SW Corner I -10 Freeway & Highway 95, Quartzsite, AZ
Website: www.tysonwells.com
Admission and parking: Free

February 10-13, 2011 Tucson
Tucson Gem and Mineral Show™,
Theme: "Minerals of California"
Tucson Convention Center, 260 S. Church St., Tucson, AZ 85701
Website: www.tgms.org
E-mail: tgms@tgms.org
Sponsored by: Tucson Gem and Mineral Society, Inc.
Hours: Thurs. - Sat. 10-6, Sun. 10-5
Admission: $9.25, 14 and under free with paying adult
Parking: Fee $8.00
Dealers Contact: Show Chairperson, P. O. Box 42588, Tucson, AZ 85733, 520-322-5773

February 11-13, 2011 Wickenburg
Gold Rush Days, Annual Gem & Mineral Show Sale, Wickenburg Community Center, 160 N. Valentine, Wickenburg, AZ
Website: www.wickenburgchamber.com
Hours: Fri., Sat. 9-5, Sun. 10-4
Admission and parking: Free
Dealers Contact: Chamber of Commerce, 800-942-5242

February 19, 2011 Phoenix
Prospectors' Day, Arizona Mining & Mineral Museum 1502 W. Washington, Phoenix, AZ 85007, 602-771-1611
Gold panning demos, gold panning equipment, and more, activities for children
Sponsored by: Arizona Mining & Mineral Museum and Arizona Prospectors Association with the Maricopa Lapidary Society
Hours: 10-4
Show Chairperson: Charles Connell, 12912 W. Solano Dr., Litchfield Park, AZ 85340, 623-935-2007

February 19-20, 2011 Mesa
Apache Jct. Rock & Gem Club Show
Skyline High School, 845 S. Crismon Rd, Mesa, AZ 85208
Sponsored by: Apache Junction Rock & Gem Club, Inc.,
Hours: Sat. 9-5, Sun. 10-4
Admission: $3.00, senior $3.00, students $1.00 with student ID, children under 12 free
Parking: Free
Show Chairperson: John Frary
Dealer Chairperson: Sharon Szymanski

February, 2011, TBA, Queen Valley
Queen Valley RV Resort Wood Carvers & Rockhounders
Queen Valley RV Resort Activity Center
50 W. Oro Viejo Dr., Queen Valley, AZ 85218
Phone: 520-463-1885