

San Diego Lapidary Society

March Program

Wednesday ** 3/10/10 ** 7:00 PM

Turquoise

Nevin will be discussing and showing the different types of turquoise from all over the world.



Membership

Dues are due * if you have not renewed ** this is your last issue

The 2010 rates are as follows:

Membership	\$25.00
Additional member at same household	\$10.00
Additional junior at same household	\$ 6.00

If you have a locker please include that with you dues payment. *Locker fees are \$10.00 per year.*

Rough Rock Sale

March 13, 2010 ** 8am to 3pm

5041 Acuna Street
San Diego, CA 92117

Older Collection
Some Equipment

Cash and Carry – Bring your own Buckets

No early birds please

2010

MARK YOUR CALENDARS 2nd ANNUAL COUNTY COUNCIL GEM AND MINERAL SHOW PRESENTED BY

San Diego County Council

APRIL 9TH 10TH AND 11TH

9A.M.- 5P.M. DAILY

EVERYONE WELCOME PUBLIC INVITED
ANTIQUÉ GAS & STEAM ENGINE MUSEUM
2040 N. SANTA FE AVE VISTA CA.92083
CALL (760) 726-7570 FOR INFORMATION
FREE EVENT FOR CUSTOMERS!

ALL VENDOR SPACES ARE ON A FIRST COME BASIS
LAPIDARY, MINERAL OR FOSSIL RELATED ITEMS ONLY

- FINDINGS, BOOKS, JEWELRY, SLABS, CABS, EQUIPMENT AND LOTS OF ROUGH MATERIAL.
- RESTROOMS ARE LOCATED ON SITE. NO HOOKUPS BUT FRESH WATER IS ON SITE DRYCAMPING ONLY.
- BREAKFAST WILL BE AVAILABLE ON FRI, SAT. AND SUN. MORNINGS. WE DO NOT HAVE ANY PRICES OR MENUS YET BUT WE WILL GET THE WORD OUT BEFORE THE SHOW.
- THERE WILL BE A LUNCHEON SERVED ON ALL THREE DAYS BUT AGAIN WE DO NOT HAVE MENUS OR PRICING AVAILABLE YET, BUT IF IT'S HALF AS GOOD AS LAST YEAR'S IT WILL BE WELL WORTH WHATEVER IT COST.
- DUE TO COUNTY REGULATIONS NO PETS WILL BE ALLOWED AT THE SHOW.
- THERE WILL BE A LARGE OPPORTUNITY DRAWING ON SUNDAY AFTERNOON AT 3 PM.
- WHATEVER YOU DIDN'T SELL AT STODDARD WELLS BRING IT TO VISTA
- IF YOU LOVE ROCKS AND LAPIDARY RELATED ITEMS YOU NEED TO MAKE THIS SHOW. BRING FIREWOOD AND YOUR CHAIRS . WE HAVE A FIREPIT ON SITE AND WILL HAVE SOME SORT OF PROGRAM FRIDAY AND SATURDAY NIGHTS
- DRIVING DIRECTIONS FROM I-5 NORTH OR SOUTH BOUND . TAKE HWY. 76 EAST TO NORTH SANTA FE AVE.(WHICH DEADENDS AT HWY 76) GO SOUTH FOR 2.3 MILES AND THE MUSEUM IS LOCATED ON YOUR RIGHT ON MUSEUM WAY
- DRIVING DIRECTIONS FROM I-15 SOUTHBOUND TAKE HWY 76 WEST TO NORTH SANTA FE AVE AND FOLLOW ABOVE DIRECTIONS I-15 NORTHBOUND TAKE HWY 78 WEST AND TURN RIGHT ONVISTA VILLAGE DR. . 0.6 MILES TURN LEFT AT N.SANTA FE DR. CONTINUE 1.6 MILES AND TURN LEFT ON MUSEUM WAY
- DRY CAMPING WILL BE AVAILABLE FOR NON SELLERS @ \$5.00 PER NIGHT SO IF YOU WANT TO COME FOR THE WEEKEND YOU'LL BE MORE THAN WELCOME
- COME ONE COME ALL RAIN OR SHINE WE'LL BE THERE

Show Dates:

MARCH 2010:

12-14--HILLSBORO, OREGON: Show, "Back Again in 2010"; Tualatin Valley Gem Club; Washington County Fair Complex, 873 NE 34th Ave.; Fri 9-5, Sat. 10-5, Sun. 10-5; contact Roy Woo, (503) 459-1903; e-mail: rwoo12648@msn.com

13-14--SAN MARINO, CALIFORNIA: Show, "Colors of Gems"; Pasadena Lapidary Society; San Marino Masonic Center, 3130 Huntington Dr.; Sat. 10-6, Sun. 10-5; free admission; raffle, sand scoop, demonstrators, vendors, jewelry, gems, rough material, beads, findings, mineral specimens, collectibles; contact Marcia Goetz, (626) 914-5030; e-mail: joenmar1@verizon.net

13-14--SPRECKELS, CALIFORNIA: Show, "Parade of Gems"; Salinas Valley Rock & Gem Club; Spreckels Veterans Hall, 5th St. and Llano St.; Sat. 10-5, Sun. 10-5; free admission; demonstrations, kids' activities, silent auction, wheel of chance, vendors, award-winning show cases, fluorescent display, free hourly drawings, raffle; contact Ernie DeFever, 31 Nacional St., Salinas, CA 93901, (831) 422-3422; e-mail: minimad64@comcast.net; Web site: www.salinasrockandgem.com

13-14--TURLOCK, CALIFORNIA: Show; Mother Lode Mineral Society; Stanislaus County Fairgrounds, 900 N. Broadway; Sat. 10-6, Sun. 10-5; adults \$5, children 12 and under free with adult; speakers for adults and kids, dinosaur and fossil talks, special fossil exhibits, children's activities, 20 continuous demonstrations, large fluorescent tent; contact Bud and Terry McMillin, P.O. Box 1263, Modesto, CA 95353, (209) 524-3494; e-mail: terry.mcmillin@yahoo.com; Web site: www.turlockgemshow.com

20-21--BAKERSFIELD, CALIFORNIA: 9th annual show, "Rock and Gem Rendezvous"; Sat. 9-5, Sun. 9-5; Kern County Shrine Club, 700 S. P St., corner of S. P and Bell Terrace; indoor/outdoor show, rocks, fossils, beads, new and used lapidary supplies, jewelry, rough material, finished gems, hourly drawing, silent auction, Spinning Wheel, demonstrations; contact Lewis M. Helfrich or Lynne G. Helfrich, (661) 323-2663; e-mail: lewsrocks@netzero.net

20-21--ESCONDIDO, CALIFORNIA: Annual show: Palomar Gem & Mineral Club; Army National Guard Armory, 304 Park Ave.; Sat. 10-5, Sun. 10-4; adults \$2, seniors (over 65) \$1, children under 12 free with adult; dealers, rough rock, finished stones, jewelry, tools, gem identification; contact Van Lynch, (760) 749-4164; e-mail: michelleandvan@hotmail.com

20-21--VALLEJO, CALIFORNIA: Show and sale, "Spring Bling"; Vallejo Gem & Mineral Society; Vallejo Elks Lodge, 2850 Redwood Pkwy.; Sat. 10-5, Sun. 10-5; adults \$3, student \$2, children free; rocks, gems, jewelry, door prizes, silent auction, "wheel of fortune"; contact Phylis Malacki, 370 W. M St., Benicia, CA 94510, (707) 745-3255; e-mail: vgms01@yahoo.com; Web site: www.iwired.org

27-28--ANGELS CAMP, CALIFORNIA: Annual show and sale; Calaveras Gem & Mineral Society; Calaveras County Fairgrounds, Hwy. 49 at Frogtown USA; Sat. 10-5, Sun. 10-4; adults \$4, kids 12 and under free with adult; rocks, minerals, jewelry, beads, supplies; contact Tak Iwata, (209) 928-5579; e-mail: Tak2me@msn.com

27-28--LEMOORE, CALIFORNIA: 2nd annual show; Lemoore Gem & Mineral Club; Trinity Hall; Sat. 10-6, Sun. 10-6; contact Judy Pereira, 335 W. D St., Lemoore, CA 93245, (559) 924-4052

27-28--ROSEVILLE, CALIFORNIA: 48th annual show; Roseville (Placer County) Fairgrounds, 800 All America City Blvd., off Washington; Sat. 10-5, Sun. 10-4; adults \$5, seniors (60+) \$4, kids 12 and under free; more than 30 vendors, crystals, gold, geode cracking, beads, gemstones, fossils, polished stones, handcrafted jewelry, opal, world-class mineral specimens, tourmaline, sunstones, bugs in amber, mineral identification, "Kids' Junction", demonstrations, silent auctions, exhibits, raffles, lapidary shop open house, information and discount coupon on Web site; contact Gloria Marie, (916) 216-1114; e-mail: gloriarosevillerockrollers@gmail.com; Web site: www.rockrollers.com

APRIL 2010:

9-11--EUREKA, CALIFORNIA: 9th annual show, "Lost Coast Jewelry, Gem, Bead & Mineral Show"; Kasey Enterprises; Redwood Acres Fairgrounds, 3750 Harris St.; Fri. 12-7, Sat. 10-7, Sun. 10-5; adults \$3, students and seniors \$1.50, children free; minerals, gemstones, crystals, beads, pearls, gold nuggets, fine jewelry, gold, quartz, fossils, tools, door prizes; contact Diana, Kasey Enterprises, P.O. Box 2927, McKinleyville, CA 95519, (707) 839-1358; e-mail: kaseyent@sbcglobal.net

10-11--KINGMAN, ARIZONA: Show, "Gems of Arizona"; Mohave County Gemstoners; Kingman Academy of Learning High School, 3420 N. Burbank St.; Sat. 9-5, Sun. 9-4; free admission; demonstrations (obsidian knapping, faceting, wire wrapping), mineral displays, silent auction, dealers, cash raffle, hourly door prizes, children's activities; contact Nan Russell, (928) 846-0927, or Donna Robinson, 3202 E. Leroy Ave., Kingman, AZ 86409, (928) 263-1480; e-mail: gemstoners@live.com; Web site: www.gemstoners.org

10-11--LANCASTER, CALIFORNIA: Show; Antelope Valley Gem & Mineral Club; Lancaster High School, 44701 32nd St. W, between Lancaster Blvd. and Ave. J; Sat. 9-5, Sun. 9-5; free admission; demonstrations, vendors, tailgaters, silent auction table, raffle drawing, games; contact Jules Ficke, 4233 W. Ave. L-4, Lancaster, CA 93536, (661) 943-5157; e-mail: av_gem@yahoo.com; Web site: www.avgem.weebly.com

10-11--MARIPOSA, CALIFORNIA: 10th annual show; California State Mining and Mineral Museum, Mariposa Gem & Mineral Club, California State Mining and Mineral Museum Association; Mariposa County Fairgrounds, Hwy. 49; Sat. 10-6, Sun. 10-4; gems, minerals, crafts, speakers, mineral exhibits, educational activities, raffles, silent auctions; contact Dianne Vereschagin or Darci Moore, (209) 742-7625

10-11--PARADISE, CALIFORNIA: Show, "Paradise of Gems"; Paradise Gem & Mineral Club; Elks Lodge, 6309 Clark Rd.; Sat. 10-5, Sun. 10-4; adults \$2; contact Manuel Garcia, 5659 Foster Rd., Paradise, CA 95969, (530) 877-7324; e-mail: mmpg@earthlink.net

16-18--SAN JOSE, CALIFORNIA: Show, "The Art of Stone"; Santa Clara Valley Gem & Mineral Society; 344 Tully Rd.; Fri. 9-5, Sat. 10-5, Sun. 10-5; adults \$6, children under 12 free; dinosaur speaker, antique appraiser, kids' education program, demonstrators, flint knapping, fluorescent minerals, dealers, displays; contact Marc Mullaney, (408) 691-1584; e-mail: geologistm@aol.com; Web site: scvgms.org



The Ultimate Field Trip

On my way to Quartzsite, I had heard from a friend of a friend, who shall remain nameless, about an abandoned rock shop. I decided to stop by and take a look. When I arrived, I met the scrap metal guy who was cleaning up all the odds and ends. I saw some pieces of saws and grinders already in his bin. He stated that the bulldozer had been here two weeks ago. I asked if he minded if I take some of the remaining rocks. He said, "Go ahead. They are selling the place."

I went back to my jeep for my rake and rock hammer. As I started turning over the rotted out wood pallets, I began to find red and yellow jasper. Under the next one I found Arizona Jasper/agate. Toward the back, I found Chrysocolla and Malachite mixed with pyrite. Under a pile of dirt, there was some brown orbicular jasper and red Cornelian.

As I was leaving I spied a large piece of blue calcite and a yellow/brown banded jasper. These would be perfect for spheres.

Upon arriving at Quartzsite, I was already loaded down with all my finds. My fortuitous stop sure did save me a lot of money. I spent only a modest amount for spheres on Septarian Nodules at Desert Gardens. Happy Hunting! Dick Sampson

Rocks and Minerals Along the Via Porphyry

by Andrew A. Sicree, Ph.D.

Imperial porphyry in Rome

Porphyry. Imperial porphyry. The name evokes images of gladiators, temples, togas, and emperors. And indeed, the emperors of ancient Rome loved it: a stone of deep purple flecked with stars of white. Purple was the color reserved for royalty and nobility and here was an immutable stone that displayed royal purple, shot through with white crystalline “stars.” Imperial desire for the stone drove masters and slaves deep into the most forbidding desert in the Roman Empire to quarry it from a mountainside in the Egyptian desert under the harshest of conditions.

Romans adorned the Pantheon with imperial porphyry, carved the robes of their statues and stone portraits from it, and built palaces and temples with pillars hewn from huge blocks of the precious stone. No stranger to excess, the Emperor Nero bathed in a huge, monolithic bathtub cut from a single block of imperial porphyry; the bathtub is today preserved in the Vatican Museums – the cost in silver and in the lives of slaves of dragging this huge block from its source is unrecorded, but tour guides tell you that it was worth more than its weight in gold.

Imperial porphyry in the East

Love of porphyry extended both east and west. In the Byzantine Empire, the Emperor Constantine erected a huge 100-foot (30 m) pillar in Constantinople consisting of nine porphyry drums, stacked one on top of the next. The importance of this pillar can be deduced from historical records that report that Constantine included a shrine at its base containing relics from the life of Christ, including baskets used in the miracle of the loaves and fishes and an alabaster ointment jar attributed to Mary Magdalene. Also included

was the Palladium of ancient Rome, a legendary object – reputedly an image of the goddess Pallas (Athena or Minerva) removed from Troy during the Trojan War – upon which the safety of the city was thought to depend. This pillar, minus its top three segments, still stands in Constantinople, the modern-day city of Istanbul. Today, it is called the “Burnt Pillar” because it survived a major fire that blackened the exterior of the ancient monument.

The importance of imperial porphyry is further emphasized by the fact that women of the imperial family gave birth in porphyry-veneered room called the *porphyra*, which guaranteed that royal children were, quite literally, *porphyrogenitos* or “born to the purple.” Other uses of porphyry in Istanbul can be seen in the eight monolithic columns of porphyry that support Hagia Sophia's *exedrae*, or semicircular niches. (Hagia Sophia is one of the world's largest churches – it was turned into a mosque after the fall of Constantinople.

The source

Treasured in ancient Rome, source of the remarkably unique imperial porphyry is reported by Pliny to have been discovered by a Roman legionnaire, Caius Cominius Leugas, in AD 18. The source was an exceptionally bleak and isolated deposit in the eastern desert of Egypt. A single quarry on the Mons Porphyry (“Porphyry Mountain” in Latin; it is now called *Gebel Dokhan* in Arabic) appears to be the source of all of the purple porphyry used in ancient Rome. The long desert road from the quarry to the Nile River is called the “Via Porphyrites” or Porphyry Road to this day. Wells necessary for watering the oxen that pulled carts loaded with huge rough-hewn blocks of porphyry mark the ancient track. The

quarry was worked on and off from AD 29 through about AD 335, after which it was abandoned and its location lost.

With the loss of the supply, reuse became the watchword for imperial porphyry. When Roman palaces and temples were torn down, their porphyry pillars were reused in later palaces and churches throughout Europe. For instance, the Cathedral of Magdeburg contains a baptismal font carved from imperial porphyry and recycled Roman columns were used in the Cathedral of Aachen.

The allure of imperial porphyry persists. When his body was exhumed from its original grave on the island of St. Helena in 1840, plans called for Napoleon to be reinterred in Paris in a tomb built of imperial porphyry. An earlier, Napoleonic effort to locate the Roman quarry had failed, and, even though the quarry had been finally rediscovered in 1823, the French Emperor was entombed in a lesser rock from Russian Finland – one that was close in appearance to imperial porphyry (some reports call the rock “porphyry” but others say it is a reddish purple sandstone – I favor the latter).

The Mons Porphyry remained lost until 1823, when the Egyptologists James Burton and John Gardner Wilkinson rediscovered it near Hurghada, Egypt, an extremely remote site. Harsh conditions at the site have defeated attempts to reopen the Roman era quarry commercially, but archaeological investigations conducted at the site have yielded valuable insights into the lives of the Roman slaves and workers who lived and died quarrying imperial porphyry. Close-up images of imperial porphyry samples can be seen on the web at:

<http://www.eeescience.utoledo.edu/faculty/harrell/egypt/quarries/gd-nw-1.jpg>

What is a porphyry?

Geologically, a porphyry (pronounced POR-fer-ee) is an igneous rock with two textures.

Porphyry has large crystal grains, called phenocrysts, imbedded in a relatively finer-grained matrix or groundmass. Typically, the phenocrysts are feldspar or quartz, although amphiboles, pyroxenes, and micas are among the possible phenocrysts. The groundmass is typically largely composed of feldspar with varying amounts of quartz, mica and other minerals.

It is important to note that the grains in the groundmass may be so fine that they cannot be distinguished with the unaided eye, or they may be larger – more than a centimeter or so. The key element that makes a rock a porphyry is the presence of some crystal grains, the phenocrysts, which are significantly larger than the grains of the groundmass. For igneous rocks, geologists use the term *aphanitic* for fine-grained “microscopic” textures and *phaneritic* to denote coarser-grained textures. A typical granite is phaneritic while basalts are aphanitic.

Properly, the word porphyry can be used as an adjective. Thus, for example, one can describe a rock as a “porphyritic rhyolite” meaning that it is a rhyolite (which is fine-grained) with larger phenocrysts. More specifically, a “porphyritic plagioclase rhyolite” or a “plagioclase rhyolite porphyry” is a fine-grained volcanic rock, rhyolite, with larger phenocrysts of plagioclase feldspar crystals. A “porphyry granite” is a granite with some crystals (often feldspars) that are significantly larger than the already coarsely-crystalline groundmass. Imperial porphyry has been described as both a “purplish-red dacite porphyry” and a “purplish-red andesite porphyry.” Andesite is a volcanic rock intermediate in silica composition between rhyolite and basalt. Dacite is a volcanic rock that falls between rhyolite and andesite on the rhyolite-andesite-basalt continuum.

Scientific importance

For the petrologist (a scientist who studies rocks), porphyritic textures indicate that an igneous rock underwent a two-stage cooling process. Initially, the parent magma cooled slowly – this typically occurs far underground – and the slow cooling rate gave some crystals the time needed to grow to a large size. The bulk of the magma remained molten and these phenocryst crystals floated in the molten magma. The second stage began when this phenocryst-bearing magma was pushed upward toward the Earth's surface. The magma might erupt onto the surface at a volcano, or it might cool and solidify in the shallow sub-surface. In both scenarios, the cooling rate is significantly accelerated and the magma solidifies completely into a solid, a porphyry. The early, larger crystals form the porphyry's phenocrysts, which are imbedded within the later-stage solid (the groundmass).

Decorative building stones

Today, porphyries find use in sculpture, tombstones, kitchen countertops, and facing stones for bank lobbies. They remain popular as decorative stones because of their attractive textures – but those same textures tell a scientific story as well. ©2010, Andrew A. Sicree, Ph.D

Dr. Andrew A. Sicree is a professional mineralogist and geochemist residing in Boalsburg, PA. This **Popular Mineralogy** newsletter supplement may not be copied in part or full without express permission of Andrew Sicree. **Popular Mineralogy** newsletter supplements are available on a subscription basis to help mineral clubs produce better newsletters. Write to Andrew A. Sicree, Ph.D., P. O. Box 10664, State College PA 16805, or call (814) 867-6263 or email sicree@verizon.net for more info.

Sherlock Holmes **and the “Blue Carbuncle”**

Its Christmastime and Sherlock Holmes, in Sir Arthur Conan Doyle's “The Adventure of the Blue Carbuncle,” sets out to track down the origin of a valuable gemstone, a “blue carbuncle,” found in the crop of a Christmas goose. The master-sleuth Holmes discovers that one James Ryder stole the gemstone from the Countess of Morcar with help from the

countess's maid, Catherine Cusack, and framed the plumber, John Horner, for the theft. Holmes solves the case, and somewhat uncharacteristically lets the thief escape to the Continent – just because it's Christmas. The case against Horner collapses, and all's well that ends well, but the reader is left wondering “exactly what is a blue carbuncle?”

An archaic term, the word “carbuncle” formerly applied to any cabachon-cut red gemstone. Often a red garnet was the stone in question, typically almandine garnet ($\text{Fe}_3\text{Al}_2(\text{SiO}_4)_3$, cubic). But the difficulty with a garnet being Holmes' “Blue Carbuncle” lies in the fact that garnets, although they occur in just about any possible color, rarely occur as strongly blue gemstones. Thus, a blue carbuncle would be quite a rare stone indeed – if it were a garnet. If one overlooks the illogical name (if a carbuncle is a red stone how can it be blue?), one can apply a bit of Holmesian logic to solving this mystery:

If a carbuncle is defined as any strongly red gemstone that is cut into a cabachon, then other, non-garnet, gemstones should also be considered. What is another red gem that is typically cut into a cabachon? The first and natural suspect is ruby – the red variety of corundum (hexagonal Al_2O_3) – which is often cabachon-cut. If we accept this possibility, then it quite logically follows that Holmes' “Blue Carbuncle” was a sapphire – the blue variety of corundum – a much more likely gemstone than a large blue garnet.

Incidentally, the carbuncle is featured several places in the *Bible* as well. The word originates from St. Jerome's *Vulgate* translation of the *Bible* where it was derived from the *Septuagint* (the Greek translation of the Hebrew scriptures). The Greek word was *anthrax*, meaning “coal” – its use referred to not to the black color of coal but rather to the red flame of a burning coal. ©2010, Andrew A. Sicree

Crystal Matrix Crossword

Iridium and Friends

ACROSS

- 2 a copper and iridium mineral
- 12 a favorite collecting site
- 14 American Geophysical Union
- 15 a spicule-like crystal
- 16 where selenite roses are found
- 17 an iridium iron mineral
- 18 town in Texas
- 20 smallest state
- 21 half a laugh
- 22 weapon made of cryptocrystalline quartz
- 28 academic (ab)
- 30 mouth noise when thinking
- 31 when collecting you go on _ _____
- 32 girl's nickname
- 33 to dump out ore
- 35 iridium
- 37 American Society of Agricultural Engineers (ab)
- 38 minerals collectors want
- 41 Greek for Chloe
- 43 365 days
- 44 near the Earth's surface
- 45 near infrared
- 47 to say it obliquely
- 49 used in rare earth magnet
- 51 feel of petroleum
- 52 study motion, time, space
- 54 extra tall
- 55 extra period of play
- 56 big hairy snowman
- 58 variety of osmium
- 62 where its ___
- 63 the boy king
- 64 Radio-Keith-Orpheum
- 65 ex-volcanic gas bubble
- 67 stone in the creek

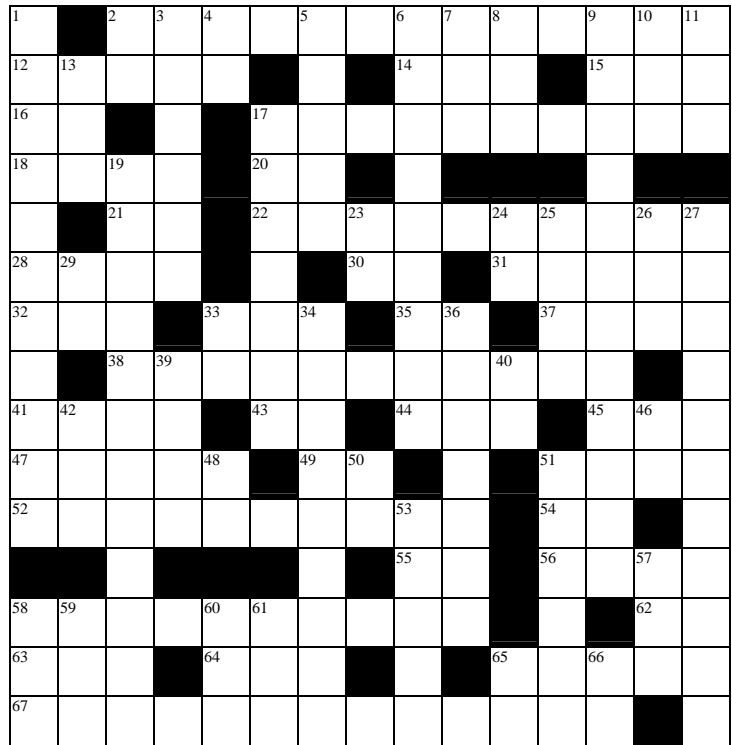
DOWN

- 1 important for mineral display at mineral show
- 2 copper
- 3 eroding a mountain
- 4 platinum

5

Biblical

- 5 Biblical gold source
- 6 sky-blue Cu iron sulfate
- 7 nickname for Ignatius
- 8 bad bomb
- 9 has iridium & ruthenium
- 10 tit for ___
- 11 ___ for eye
- 13 also known as (ab)
- 17 how Crazy Lace Agate's appear to move
- 19 copper iron sulfide
- 23 ruthenium
- 24 a snort
- 25 and others
- 26 diamond (ab)
- 27 platinum arsenides
- 29 found in cerianite
- 33 found in avicennite
- 34 fruit of the gods
- 36 to strike back verbally
- 39 lubricates
- 40 in Pepto-Bismol
- 42 flux (liter/meter/hr)
- 46 big fluorite area
- 48 an exclamation
- 50 not amiss



53 hammer and _____

57 a little bit

58 ___ a matter of faith

59 get out of your ___

60 a drowning person says

61 49'ers were fastest at this

65 ancient Chinese game

66 Old English (ab)

LAST MONTH'S SOLUTION: Places

M	C	M	I	C	R	O	S	O	M	M	I	T	E
E	O	L	I	C	H	T	R	I	N	E	O		
T	A	R	N	H	Y	D	R	O	X	I	D	E	S
A	L	E	A	M	I								
M	F	R	D	E	C	A	H	E	D	R	O	N	
O	P	U	S	R	F	T	T	I	B	I	A		
R	U	R	D	I	U	I	T	E	O	N	S		
P	T	Y	R	A	N	N	O	S	A	U	R	T	
H	A	H	A	N	I	N	U	T	I	R	R		
I	N	E	R	T	P	T	N	A	T	M	O		
C	O	R	D	I	L	L	E	R	A	G	E	P	
			A			A	A	M	A	P	H		
C	I	N	C	I	N	N	A	T	I	T	H	A	I
S	L	C	R	U	E	I	R	E	A	C	T		
A	L	E	X	A	N	D	R	I	T	E	S	T	E

51 not found in Ir minerals