

San Diego Lapidary Society

September

Wednesday ** 9/08/10 ** 7:00 PM

Gem Feldspars

Counterfeit Sunstones

*Can you tell the difference of a real sunstone
and a counterfeit sunstone?*

It's Show Time

GET READY FOR IT

San Diego Lapidary Society
Annual Rock, Gem, Mineral and Jewelry Show
September 25th 2010
10:00am to 3:00pm

We will also have a lunch BBQ with hot dogs, chips and drinks.

Bring the family and let's have some FUN!

THIS IS A MINI SHOW WE ARE HAVING THIS YEAR. ALL SPACES ARE \$25.00. PLEASE CONTACT A BOARD MEMBER TO RESERVE YOUR SPACE TODAY, OR EMAIL INFO@SANDIEGOLAPIDARYSOCIETY.ORG WE HAVE 1 INSIDE SPACE LEFT AND SEVERAL OUTSIDE SPACES AVAILABLE. ONE TABLE IS INCLUDED FOR SPACE INSIDE. IF YOU WOULD LIKE AN OUTSIDE SPACE, PLEASE BRING YOUR TABLE AND AWNING.

Show Dates:

<http://www.rockngem.com/showdates.asp>

SEPTEMBER 2010:

3-6--FORT BRAGG, CALIFORNIA: 48th annual show; Mendocino Coast Gem & Mineral Society; Town Hall, Main and Laurel; Fri. 10-6, Sat. 10-6, Sun. 10-6, Mon. 10-4; free admission; contact Don McDonell, P.O. Box 868, Fort Bragg, CA 95437, (707) 964-3116, or Jane Webb, (707) 964-7182

4-6--CANBY, OREGON: Show, "Willamette Valley Gem, Mineral & Jewelry Show"; Oregon Gem, Mineral & Jewelry Shows; Clackamas County Fairgrounds, 694 N.E. 4th Ave.; Sat. 9-6, Sun. 9-6, Mon. 9-4; free admission; contact Jean Miller, P.O. Box 136, Molalla, OR 97038, (503) 829-2680; e-mail: shadow92337@molalla.net; Web site: www.ogmshows.com

4-6--SILVER CITY, NEW MEXICO: 27th annual show; Rolling Stones Gem & Mineral Society; Grant County Business and Conference Center, 3031 Hwy. 180 E, next to ACE Hardware; Sat. 10-5, Sun. 10-5, Mon. 10-4; free admission; more than 55 dealers, daily free field trips, silent auction, wheel of fortune; contact Marcia Andre, 1311 Peterson Dr., Silver City, NM 88061, (575) 534-0006; e-mail: marciarandre@gmail.com; Web site: www.rollingstonesgms.blogspot.com

10-12--FERNDALE, CALIFORNIA: 6th annual show, "Wildcat Gem Fest"; Wildcat Gem & Mineral Society; Humboldt Co. Fairgrounds, 1250 5th St.; Fri. 12-7, Sat. 10-7, Sun. 10-5; free admission; door prizes, raffles, kids' games, demonstrations, classes, gems, minerals, fossils, jewelry, silent auction; contact Mike Martin/The Stonery, P.O. Box 189, Miranda, CA 95553, (707) 499-6194; e-mail: micknorma@directv.net

11-12--DOWNEY, CALIFORNIA: Show; Delvers Gem & Mineral Society; Woman's Club of Downey, 9813 Paramount Blvd.; Sat. 10-6, Sun. 10-4; free admission; contact Fred DEXLING, (562) 425-0192; e-mail: mdexling@verizon.net

11-12--ROSEBURG, OREGON: Show, "Rough to Gems"; Umpqua Gem & Mineral Club; Douglas County Fairgrounds, I-5 Exit 123; Sat. 10-6, Sun. 10-4:30; free admission; dealers, rough, gems, minerals, fossils, beads, jewelry, tools, equipment, books, display cases, demonstrators, knapping, UV mineral exhibit, silent auction, wheel of fortune, geode cutting, raffle, door prizes, gold panning, kids' rock hunt; contact Bob Sampson, 752 Cooper Creek Rd., Sutherlin, OR 97479, (541) 459-1755; e-mail: davenmow@q.com

11-12--WALLA WALLA, WASHINGTON: Show, "Walla Walla Gem & Mineral Show"; Marcus Whitman Gem & Mineral Society; Walla Walla County Fair Ground, Community Center, 9th St. and Orchard; Sat. 10-5, Sun. 10-5; dealers, opal, petrified wood, jasper, agate, sunstone, wire wrapping, faceted gems, slabs, rough, jewelry, silent auction, demonstrations, kids' section; contact Warren Rood, (509) 522-2330; e-mail: warrenrood@yahoo.com

17-19--COOS BAY, OREGON: Show, "South Coast Rock & Gem Fest 2010"; Far West Lapidary and Gem Society; 4th St. parking lot, across from Outdoor-In, downtown; Fri. 10-5, Sat. 10-5, Sun. 10-5; dealers, rockhound sales, jewelry, gems, minerals, fossils, rough and finished rocks, tumbled rock, geodes, faceted stones, cabochons, thunder eggs; contact Rocky Pribble, P.O. Box 251, Coos Bay, OR 97420, (541) 572-8301

17-19--HILLSBORO, OREGON: 30th annual show; Portland Regional Gem & Mineral Show Association; Washington County Fairgrounds, 873 NE 34th Ave., Hwy. 26 Shute Rd. exit; Fri. 10-6, Sat. 10-6, Sun. 10-5; contact Josh Heater, (971) 570-5456; e-mail: jfrankray@hotmail.com

18-19--CASTLE ROCK, WASHINGTON: Show; Southern Washington Mineralogical Society; Castle Rock Fairgrounds; Sat. 10-6, Sun. 10-4; spin table, gem dig, country store, magnetic sand, gold panning, rock cutting, silent auction, live auction Sat., demonstrations, door prizes, scholarship raffle, black light display, dealers; contact Fran Wolff, P.O. Box 1492, Kalama, WA 98625, (360) 560-2987; e-mail: fwolff@comcast.net

Show Dates: continued :

18-19--REDWOOD CITY, CALIFORNIA: 44th annual show, "Harvest of Gems"; Sequoia Gem & Mineral Society; Community Activity Bldg., 1400 Roosevelt Ave.; Sat/ 10-5, Sun. 10-5; free admission; kids' activities, dealers, member displays, silent auction, earth science room; contact Carol Corden, P.O. Box 1245, Redwood City, CA 94064, (650) 248-7155; e-mail: ccorden@earthlink.net; Web site: <http://sgms.driftmine.com>

24-26--SAN BERNARDINO, CALIFORNIA: Show, "OBMS Tail Gate Gem & Mineral Show"; Orange Belt Mineralogical Society; Western Regional Little League Ball Park, 6707 Little League Dr.; Fri. 9-dusk, Sat. 9-dusk, Sun. 9-dusk; free admission; rocks, jewelry, tools, lapidary display, education, kids' event, kids' club, silent auction, raffle, workshop; contact Shane Ripley, 205 W. Benedict #8, San Bernardino, CA 92408, (909) 557-3605; e-mail: OBMS_PR@yahoo.com; Web site: <http://obmsrocks.yolasite.com>

25-26--MONTEREY, CALIFORNIA: 51st show; Carmel Valley Gem & Mineral Club; Monterey Fairgrounds, 2004 Fairgrounds Rd.; Sat. 10-6, Sun. 10-5; adults \$3.50, senior \$2.50, children free with adult; exhibits, kids' stuff, grab bags, door prizes, wheel of fortune, demonstrations (fossil impressions, sphere making, silver jewelry making, grinding and polishing gemstones); contact Janis Rovetti, 1047 Roosevelt St., Monterey, CA 93940, (831) 657-1933; e-mail: janis12@sbcglobal.net; Web site: www.cvgms.org

OCTOBER 2010:

2-3--OROVILLE, CALIFORNIA: 3rd annual show; Feather River Lapidary & Mineral Society; Oroville Rock Club, Municipal Auditorium, 1200 Myers St.; Sat. 10-5, Sun. 10-4; adults \$2, children under 12 free; rocks, gems, minerals, fossils, vendors, rough material, cabochons, handmade cabinets, tools, books, tumblers, wire wrappers, Wheel of Fortune, grab bags, polished rocks, raffles, door prizes, 2nd Annual World Rock Tumbling Championship; contact Connie Rossetto, P.O. Box 5772, Oroville, CA 95966, (530) 589-1840; e-mail: Crossetto@aol.com; Web site: www.orovillerocks.com

8-10--BIG SUR, CALIFORNIA: 19th annual show, "Big Sur Jade Festival"; South Coast Community Land Trust, Pacific Valley School PTO; Pacific Valley School, Hwy. One, opposite Sand Dollar Beach in Los Padres National Forest; Fri. 12-6, Sat. 10-5, Sun. 10-5; free admission; jade, jewelry, sculpture, raffle; contact Kirk Brock, (831) 659-3857 or 831-402-1143; Web site: www.bigsurjadefestival.com

9-10--GRASS VALLEY, CALIFORNIA: Show, "Earth Treasurers 2010"; Nevada County Gem & Mineral Society; Nevada County Fairgrounds, Main Exhibit Hall, 11228 McCourtney Rd.; Sat. 10-5, Sun. 10-5; rock and mineral exhibits, special petrified wood display, display cases, hourly prizes, mineral identification, children's games, raffles, door prizes; adults \$2, children free; contact Kim Moore, (530) 470-0388, or Joyce Emerson, (503) 559-2595

9-10--PAYSON, ARIZONA: 13th annual show; Payson Rimstones Rock Club; Mazatzal Hotel & Casino Event Center, Tonto Apache Reservation; adults \$3, children under 12 free; gems, minerals, fossils, lapidary equipment, children's (and adults') education center, spinning wheel, silent auction; contact Barry or Margaret Jones, (928) 476-3513 or (928) 970-0857

9-10--TRONA, CALIFORNIA: 69th annual show, "Gem-O-Rama 2010"; Searles Lake Gem & Mineral Society; SLGMS Lapidary and Show Bldg., 13337 Main St. (at Trona Rd.); Sat. 7:30-5, Sun. 7:30-4; free admission; 21 dealers, 50 exhibits, geode cutting and sales, demonstrations, door prizes, kids' games, field trip supplies, field trip video presentation, 3 field trips to Searles Dry Lake; contact SLGMS, PO Box 966, Trona, CA 93592-0966; or Jim Fairchild; e-mail: jbfairchild@iwvisp.com

9-10--VISTA, CALIFORNIA: Annual show; Vista Gem & Mineral Society; Antique Gas and Steam Engine Museum, 2040 N. Santa Fe Ave.; Sat. 10-5, Sun. 10-4; free admission; 13 dealers, gems, jewelry, slabs, specimens, fossils, tools, books, gem identification, demonstrations, displays, wheel of fortune, raffle; contact Fred Wilson, (760) 433-8446, or Lois M. Harr, (760) 724-0395

Show Dates: continued :

15-17--DEL MAR, CALIFORNIA: Show, "Gem Faire"; Gem Faire Inc.; Del Mar Fairgrounds/Exhibit Hall, 2260 Jimmy Durante Blvd.; Fri. 12-7, Sat. 10-6, Sun. 10-5; weekend pass \$5; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

16--WEST HILLS, CALIFORNIA: 12th annual show; Woodland Hills Rock Chippers; First United Methodist Church, 22700 Sherman Way; Sat. 10-5; free admission; dealers, gems, minerals, rocks, fossils, jewelry, displays, demonstrations, silent auction, crafts, Future Rockhounds of America booth, kids' activities; contact Mary-Beth Pio, (818) 349-2943; e-mail: info@rockchippers.org; Web site: www.rockchippers.org

16-17--CAYUCOS, CALIFORNIA: 9th annual fall show; San Luis Obispo Gem & Mineral Club; Cayucos Vets Hall, 10 Cayucos Dr., next to Cayucos Pier; Sat. 9-5, Sun. 9-5; free admission; rocks, gems, mineral, fossils, crystals, meteorites, beads, slabs, carvings, lapidary equipment, door prizes, drawing; contact Mike Lyons, 7343 El Camino Real #301, Atascadero, CA 93422; (805) 610-0757; e-mail: jadestar@charter.net; Web site: http://slogem.org

16-17--PLACERVILLE, CALIFORNIA: Show, "All That Glitters"; El Dorado County Mineral & Gem Society; El Dorado County Fairgrounds, 100 Placerville Dr.; Sat. 10-5, Sun. 10-5; adults \$3, children free; more than 40 dealers, case displays, special petrified wood exhibit, demonstrations, kids' activities, silent auction, presentations, prizes; contact Karen Newlin, 4232 Gailey Circle, Cameron Park, CA 95682, (530) 676-1643; e-mail: info@rockandgemshow.org; Web site: www.rockandgemshow.org

16-17--SANTA ROSA, CALIFORNIA: 34th annual show; Santa Rosa Mineral & Gem Society; Sonoma County Veterans Memorial Bldg., 1351 Maple Ave.; Sat. 10-6, Sun. 10-5; admission \$5, coupon on Web site; contact Debbie Granat, (707) 542-1651; or Erica Tanner; e-mail: santarosarockshow@hotmail.com; Web site: www.srmgs.org

16-17--SEDONA, ARIZONA: Show; Sedona Gem & Mineral Club; Sedona Red Rock High School Cafeteria, 995 Upper Red Rock Loop Rd.; Sat. 10-5, Sun. 10-4; free admission; guest speakers, slide shows, Kids' Corner, displays, demonstrations, raffle, gemstones, minerals, crystals, fossils, beads, jewelry; contact Gayle Macklin, P.O. Box 3932, Sedona, AZ 86340, (928) 399-9588; e-mail: gayleis@gmail.com

16-17--WALNUT CREEK, CALIFORNIA: Show, "Contra Costa Crystal Fair"; Pacific Crystal Guild; Civic Park Community Center, 1375 Civic Dr. at Broadway; Sat. 10-6, Sun. 10-4; admission \$6; contact Jerry Tomlinson, (415) 383-7837; e-mail: sfxtl@earthlink.net; Web site: www.crystalfair.com

Membership

The 2011 rates are as follows:

| | |
|-------------------------------------|---------|
| Membership | \$30.00 |
| 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.*

Any new member joining the Society on or after July 1st shall become an active member for the remainder of the current year with prorated dues based on the remaining time and the appropriate dues of the incoming year. (Prorated dues = \$2.50 per month plus incoming year.)

Household Mineralogy

by Andrew A. Sicree

Minerals and rocks in the home

We live in a world of plastic and steel. Apart from those household items that have their origin in plants (wood and cotton) or animals (wool), most of the things we use every day originate from a hole in the ground. Plastics come from petroleum, steel from iron ore, wallboard from gypsum from the burning of coal, and computer chips come from quartz sand. The list goes on. All of these items are derived from highly processed minerals.

Our ancestors lived in a world of stone and wood – they were perhaps more familiar with the raw minerals and rocks that they used in everyday life. But still today, we have minerals around the home, minerals and rocks that are used with a minimal amount of processing – typically little more than cutting or crushing and mixing with other materials. Let's go on a geological field trip around the typical home.

Scoria

The “lava rock” sold for use in gas barbecue grills is typically a basaltic scoria. Heated stone evens out the grills heat and the vesicles in the basalt help to catch grease falling from grilled food.

Pumice

Pumice is a volcanic rock – it really is a volcanic glass. Pumice makes a good abrasive and blocks of the stone are used to scour dead skin from calloused feet. Pumice is also found in Lava brand soap – this soap is a good hand cleaner precisely because it takes off skin as you use it. It is definitely not a beauty soap!

Graphite

Pencil lead is made of the mineral graphite, admixed with some clay minerals. And, as pencils are common household items, so graphite is, too. But another household use for graphite is as a dry lubricant for locks. We use a small tube of graphite powder to lubricate the wheels of our sons' Cub Scout Pinewood Derby cars.

Chalk

Chalk is a calcium carbonate rock formed from deposits of the carbonate scales of marine phytoplankton. Blackboard chalk is a big use for this soft white rock. Around the home it can be found in children's sidewalk chalk and in toothpaste, where it serves as a mild abrasive (chalk has Mohs hardness of 4, your teeth have a hardness of about 5, so it won't scratch your teeth.)

Slate

Slate is a very fine-grained metamorphic rock that lends itself to being cut into flat plates. Schoolhouse chalkboards were classically made of slate (although artificial “blackboard” materials have taken over in many school). Household uses of slate included slate roofs. A properly installed and maintained slate roof can last 100 years, compared with a 20-year life span for asphalt roofs. Because it is non-conductive, slate was formerly used as backboards for household circuit breakers. Slate circuit boards will have been replaced in any house with modern wiring, but the old slate circuit boards may still be hanging on the basement walls.

Slate is used in the bed of better-quality billiards and pool tables. It makes the pool table very heavy, but gives a very flat and stable surface that will not warp with changing humidity.

Vermiculite

Vermiculite, an expandable mica, finds a variety of uses in the home. Vermiculite is a sheet silicate mineral with water molecules between its layers. Upon heating, the interplanar water boils to a vapor and puffs up the vermiculite crystals in much the same manner as popcorn pops.

In many old houses, expanded vermiculite has been used as a thermal insulation material. Typically, single crystal flakes about 0.25 inches across are expanded and the puffed up granules are poured or blown into spaces between the walls. Expanded vermiculite is inexpensive, nonconductive, and fireproof – an ideal insulating material. Unfortunately, vermiculite insulation got a bad rep when it was discovered that vermiculite from a major producer – W. R. Grace's mine in Libby, Montana – contained very unhealthy levels of asbestos. Although many homes have been remediated, houses still have asbestos-containing Libby vermiculite hidden in their walls. It is important to recognize that vermiculite itself isn't a health hazard.

Vermiculite can be spotted around the home in plant potting mixes (as those silvery or golden flakes), in kitty litter, and in gasoline spill clean-up kits.

Coal

Coal, of course, has been popular for home heating for more than 150 years. Many houses still heat with coal, although the advent of automatic coalers make shoveling coal into the furnace a thing of the past for most householders. Many automatic coalers require “pea” (13/16” – 9/16”) or “buckwheat” (9/16” – 5/16”) sizes, so the coal cellar full of baseball-sized rocks is also a thing of the past. Although coal produces about 50% of our country’s electricity, Americans are becoming less and less familiar with coal. Each year, I’m amazed at the fact that few of my geology students recognize coal, even though I teach geology in Pennsylvania, a major coal-producing state.

Even if an older house is now heated with gas or electricity, one can still sometimes spot the metal hatches over the coal chute through which the deliveryman poured his load of coal. An overlooked chunk might still lurk in a dark, unswept corner of your basement.

Both anthracite (hard coal) and bituminous (soft) coal are used for home heating. Coal can also be found in some aquarium filters and water filters.

Kitchen countertops

Stone countertops for kitchens and bathrooms crop up in expensively-appointed homes. The custom stone industry sells a variety of “granites” and “marbles” but these are trade names, not geological terms. In general, the “granites” are silicate rocks while the “marbles” are carbonate rocks. Some stone, such as “Missouri Red Granite,” really is granite. Other stones, such as “black granites,” might really be gabbros, diorites, anorthosites, or even larvikites. Some stones sold as “granites,” especially those with swirled patterns, are metamorphic gneisses. One can even find pegmatite veins running across some people’s kitchen counters.

Countertop marbles can be true marble. Snow-white marbles are often preferred for bathrooms, for instance. Other stones sold as “marbles” include travertines and limestones. Green marbles may be serpentinites. Travertines are hot-spring deposits and often are very porous – usually these rocks must be coated with a plastic sealant before use. Fossiliferous limestones display interesting patterns from the cut-through brachiopods and gastropods that are commonly found in such stones. Fossil-bearing limestones from Pakistan are popular for use in stone bathroom sinks and stone urns and pillars.

Clearly, any rock displaying well-preserved fossils cannot be a true marble.

Talc

Formerly, most baby powder was made from talc, the softest mineral. Often the bottle read “talcum powder.” Concerns over exposing infants to trace asbestos and other mineral dusts resulted in the replacement of talc with powdered corn starch in most baby powders in use today.

Soapstone (massive talc) is used for side panels in some modern wood burning stoves manufactured in Vermont. The soapstone absorbs heat and radiates it more steadily than iron stove sides. For a similar reason one may find soapstone used to make boot warmers.

Hand-carved gemstone boxes, made of soapstone and sometimes inlaid with mother-of-pearl flowers, are popular gift items. Many of these are carved in India, Pakistan, or China.

Garnet

Garnets can be gemstones, but it is more common to find garnets at home in the form of garnet sandpaper. Some sandpapers were originally covered with grains of quartz sand but synthetic materials like aluminum oxide (the mineral corundum is aluminum oxide) are more commonly used today. Similarly, emery paper and emery boards for sanding fingernails utilize synthetic or natural corundum (emery) as the abrasive. Garnet sandpapers are used for woodworking and have a distinctive orange color.

Mica

Muscovite mica, a silvery sheet silicate mineral, is found in a surprisingly wide range of household products. Crushed mica is used as a glitter in make-up products ranging from lipstick to blush to metallic fingernail polishes. Similarly, crushed mica is used in automobile paints to give a “metallic” flash to a car’s paint job.

Boards made of compressed mica fragments are used as insulators in kitchen toasters where they support the electrical heating coils. Mica is ideal for this job because it is a non-conductor and is fireproof.

Sheets of mica called isinglass were used to make fireproof lampshades and employed in windows in wood burning stoves.

Feldspar

Crushed feldspar has been an abrasive ingredient in scouring powders such as Bon Ami – although its tendency to scratch plastic, vinyl, and metal finishes has made it decline in popularity.

Borax

Although many are not aware that it is a natural product, borax makes a good detergent. The borax in Twenty Mule Team Borax, a laundry detergent, is a naturally occurring mineral. As mined in places such as Death Valley, “borax” is a mixture of the mineral borax and other closely related sodium borate minerals.

Halite or salt

Salt is perhaps the oldest household mineral. It comes from either evaporate deposits near the sea (“sea salt”), or from underground mines as the mineral halite. The salt used in household saltshakers has typically been recrystallized and iodized, and it has some anti-clumping agents (such as sodium silicoaluminate) added to keep it free-flowing even in humid environments.

Rock salt is used to de-ice sidewalks and driveways in winter. This material is usually obtained from underground salt mines and the amount of processing is minimal.

Gemstones

No discussion of household minerals would be complete without mentioning gemstones. Gemstones found in the typical jewelry box range from the rare (diamond, tanzanite) to the common (smoky quartz and amethyst). Gemstones usually come from among the harder minerals like corundum (ruby and sapphire), beryl (aquamarine and emerald), and topaz. Turquoise, opal, and jet are typically the softest and most easily damaged of the common gems. Garnets, lapis lazuli, citrine (yellow quartz), agates, and many other minerals and rocks can be found in jewelry as well.

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*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.*

Emery

Emery in the form of emery boards and emery paper is a common enough household item and we are told that emery is just a variety of corundum (hexagonal Al_2O_3). This is true up to a point, but naturally-occurring emery is usually a mixture of minerals. The predominant mineral is corundum, which is quite hard ($H = 9$). But other minerals occur intimately mixed with the corundum in the emery. Iron-bearing spinel minerals such as magnetite (cubic Fe_3O_4) and hercynite (cubic FeAl_2O_4), and rutile (tetragonal TiO_2) contribute to making emery a dark gray to black material. Because these minerals are softer than corundum, the effective hardness of emery is something less than nine.

Formerly, the Greek island of Naxos was the most important source of this industrial abrasive, but the widespread manufacture of cheaper synthetic abrasives has cut into demand for emery.

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The Mohs hardness Scale

1. Talc
 2. Gypsum
 3. Calcite
 4. Fluorite
 5. Apatite
 6. Feldspar
 7. Quartz
 8. Topaz
 9. Corundum
 10. Diamond
-

BRASS ETCHING CLASS

SEPTEMBER 18, 2010

12:30 – 4:00

LIMITED TO 5 STUDENTS

Crystal Matrix Crossword

Not Quite Rock

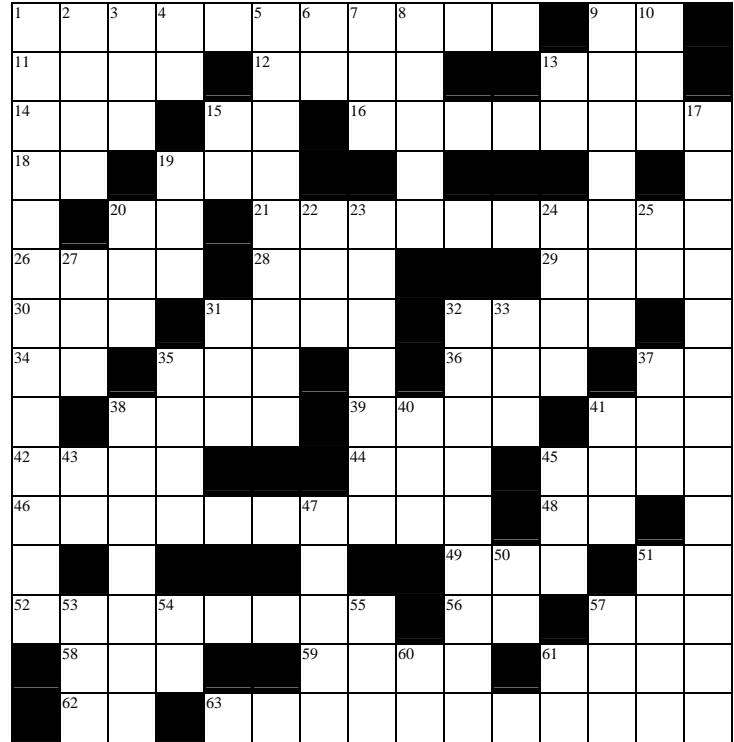
ACROSS

- 1 layered types of rocks
- 9 state noted for soapstone
- 11 longer periods of time
- 12 used to identify minerals
- 13 useful for writing specimen labels
- 14 opposite of outa
- 15 time more than 2010 years ago
- 16 "strange rock" found in another rock
- 18 very fast type of jet aircraft
- 19 source of natural halite
- 20 anti-aircraft
- 21 lead and chlorine mineral
- 26 major uranium mine
- 28 International Labour Relations (ab)
- 29 comes before twoer
- 30 not true
- 31 rock group
- 32 temporary license
- 34 Canadian province (ab)
- 35 suite (ab)
- 36 cheer
- 37 for example
- 38 opposite of a watcher
- 39 not quite like an eyelet
- 41 one more than a single
- 42 a better thought
- 44 an ancient Tongan dance
- 45 red variety of corundum
- 46 chalcopyrite habit
- 48 silver
- 49 like a referee
- 51 home of Flint Ridge
- 52 fine layers inside rocks
- 56 radium
- 57 Mineral Information Inst.
- 58 car club
- 59 disease dangerous to collectors
- 61 soft layered silicate
- 62 fluorescent (ab)
- 63 those who study minerals

DOWN

- 1 studying shaking rocks
- 2 more longer times

- 3 found in every cell
- 4 island (ab)
- 5 found stuck in a rock
- 6 National Review (ab)
- 7 unavoidable
- 8 twelve months =
- 9 quartz or calcite lines cutting through rock
- 10 gives miners a blast
- 13 like palladium
- 15 found in beryl
- 17 Egyptian writing
- 19 ___ Paulo in Brazil
- 20 like beer
- 22 white garment
- 23 found in uraninite
- 24 ancient mariner
- 25 found with gold at Cripple Creek, CO
- 27 kith and ___
- 31 not like an eight
- 32 the guy with the gold
- 33 tit for ___
- 35 done remove dirt from minerals
- 37 motion of tides
- 38 in tenths



- 40 law degree
- 41 how minerals are gotten
- 43 between ti and ra
- 45 strike on the knuckles
- 47 amorphous silica mineral
- 50 like mom
- 51 not quite oiler
- 53 Army Air Force
- 54 each
- 55 an ___ for an ___
- 57 girl's name like May
- 60 state with a cape
- 61 found in thorite

LAST MONTH'S SOLUTION: More Zeo

