



From the President's Pen

I do hope that many of you took a moment and read a few stories or articles from Geology.com identified in last month's bulletin. It is updated daily and provides the latest and greatest news of interesting geological events.

This past month there were several earthquakes in the Pacific Ocean region, and there was even one in New York. There are many other interesting stories that talk about: a new super volcano caldera found in New Zealand; information that points out that there is sedimentary rock on Mars; and more Nazca lines are being found through updated technology. Just take a moment and see the exciting things that are happening around us.

Speaking of exciting things, the lapidary shop is up and running with many members attending on Mondays and Wednesdays each week. We are working on setting a time and getting personnel together to perform some much needed maintenance on the lapidary shop, and the club show trailer transition is also in the works. If you have the time, talent or knowhow any help would be greatly appreciated no matter what you can do to help out.

It has been a comfortable fall for once in a great while, and appears that as of writing this, winter is finally going to start attempting to make a show. So stay warm and enjoy all the fallen leaves you now have to rake up in your yard! I would like to also wish you all a Merry Christmas and a wonderful New Year.

— Glenn Fiala

Show Trailer Work Party December 7 - See Page 5

Holiday Party Schedule

6:00 - 6:30 **Set up** tables,
decorations, food, drinks.

6:30 **POTLUCK DINNER**

Business Meeting

Presentation of CFMS Awards to 2019 Officers

Installation of 2020 Officers

Gift Exchange



RRR Building Fund

We have set up a new account for our Building Fund! Thanks to our members' generous donations, we have \$655 in the account.

If you overpay on your membership dues, or simply wish to contribute, we will allocate your donation to the Building Fund.

Educational Program December 10, 2019

POTLUCK DINNER! (In the Garden Room)

WEAR YOUR NAME BADGE!



Please bring your own plates and utensils. The club furnishes meat & beverages. **You are welcome to bring table decorations, as well.**

Members: please bring the suggested potluck items as determined by the first letter of your last name. Last name beginning with letters:

A-E please bring a salad or side dish

F-L please bring a dessert

M-Z please bring a hot dish/main dish

If you wish to participate in the optional **Gift Exchange**, please bring a wrapped gift (\$10 maximum). Bring a female gift if you are female, male gift if you are male, junior gift if you are junior.

Label the gift – male, female, or junior.

Inside this issue:

Meeting Minutes	2
Rookie News, Announcements	3
2020 RRR Membership Dues, Lapidary Shop News, Lapidary Classes	4
More Lapidary Classes, Thanks To ..., Show Trailer Work Party, Stabilized Turquoise	5
Stabilized Turquoise, cont'd	6
Calendar, Membership Renewal Form	7
Upcoming Northern California Shows, Rock (Radiometric) Dating	8

MINUTES FOR ROSEVILLE ROCK ROLLERS EDUCATIONAL MEETING NOVEMBER 12, 2019

Call to Order at 7:00 p.m. by President Glenn Fiala.

Flag Salute.

Introductions of Guests and New Members.

Present: Members 48+, Juniors 1 and Guests 3.

Program - VP Jan Kessler introduced Dick Hilton from Sierra College who gave a presentation on earthquakes and volcanoes.

Business Meeting:

Drawings – winners: Member, Jan Kessler; Junior, Arnab Dabke; and Guest Janice Foley.

Sunshine – no report.

Juniors – Carole Kowalik reported 4 Juniors were at the Rookies' meeting. She thanked RRR members who assisted with the Rookies. The program was to study metamorphic rocks and the activity was to crack open some ugly rocks to find nice crystals!

Treasurer – Terry Yoschak had no report.

Secretary/Membership – Florence Brady reported she is accepting membership renewals along with applications.

Programs – the December Educational Meeting will be a potluck dinner, installation of RRR Officers, distribution of CFMS triangles and bars and an optional gift exchange.

CFMS Director – Mike Hunerlach reported he did not attend the CFMS meeting in Visalia. Glenn reported Kim Fiala was elected Secretary and Jim Barton is 2nd VP. Camp Paradise is looking for a storage trailer, we will let them know about our old storage trailer which will be available at a later date. Kim has CFMS Raffle tickets available.

Vest, Tee Shirts & Patches – Jan has all sizes available.

Field Trips – Gene Doyle reported on the field trip to Black Butte Lake (10 attendees). He shared upcoming field trips to Meadow Vista and to Indian Springs this month.

Librarian/Historian – Karla Shannon reported she has bought books and other items at an estate sale. Some are for the Silent Auction, some are free and others will be in the Library for checkout. Please return any items checked out for more than 60 days.

Show – Show Chair Jim Hutchings reported our next Show Committee meeting will be Nov 19th. Interested members were invited to attend. Vendor contracts were sent out and some have been returned already! (RRR members)

Lapidary Shop – Chair Denise Coyne reported the 24 inch saw will be replaced with a saw donated by RRR member Don Tadlock. The lapidary shop saw will be put up for sale. To be determined is the date for the work party to do the needed repairs to the shop.

Lapidary Classes – Cathy Nelson was absent, presently no classes are offered.

Refreshments – need signups for the 2020 educational meetings.

Old Business –

Election of RRR Officers for 2020. A motion was MSA to approve the slate of RRR Officers for 2020 as published in the bulletin.

Update on storage trailers – Kim Loe reported on the need for a place to park the new storage trailer. Presently work parties will be held to outfit the new trailer so items now in the old trailer can be stored inside. After the old trailer is emptied, it will be sold or donated.

Update on repairs to the Lapidary Shop - Glenn recently returned home and hopes to get started on this project along

with Rob Blazina in the near future.

New Business – none.

Other Business – Jim Hutchings and Stan Bollinger showed a fish fossil which was cleaned by Stan. Jim has many more donated fish fossils that need to be worked on. Then the cleaned specimen will be shown to Sierra College and if they already have the specimen, the RRR member gets to keep the specimen. Jim will have specimens available for pick up. Debbie Bunn, FFF member, will be contacted to see how she can help with this project.

General Announcements – see bulletin for upcoming shows. Denise announced she brought grit to use for tumbling rocks for the Kids' Junction (grab bags).

Silent Auction – Janet Longueira reported the SA will run for 10 more minutes.

Adjournment – meeting was adjourned at 8:15 p.m.

MINUTES FOR ROSEVILLE ROCK ROLLERS BOARD MEETING NOVEMBER 12, 2019

Call to Order – at 8:24 p.m. President Glenn Fiala.

Present – 9 officers, a quorum was present.

Membership Applications – a motion was MSA to approve the membership applications for Kelly Grant and Ruth Goodfield.

VHS tapes – Karla has about 2 dozen VHS tapes which might be appropriate for lapidary instructions. They need to be reviewed, need to make sure they are not outdated and if appropriate, could be recorded to DVD format. Some could be given to the Silent Auction.

Adjournment – meeting was adjourned at 8:30 p.m.

Respectfully submitted,

Florence Brady, RRR Secretary

MINUTES FOR ROSEVILLE ROCK ROLLERS BOARD MEETING NOVEMBER 26, 2019

Call to Order by President Glenn Fiala at 7:05.

Roll Call – due to the bad weather and/or being out of town for the holiday, there were only 6 Officers present. Glenn appointed Protém, Denise Coyne and Lindy Summer-Bair. Officers present were: Florence Brady, Glenn Fiala, Jim Hutchings, Cathy Nelson, Karla Shannon and Carole Kowalik. A quorum was present with the addition of Denise and Lindy.

Minutes – a motion was MSA to approve the minutes for the Board Meeting on Oct. 22, 2019 and the Ed. Mtg. and Bd. Mtg. on Nov. 12, 2019.

Treasurer – Terry Yoschak was absent.

Correspondence – Florence Brady reported she sent a thank you letter to Glenn Crockett.

Membership/Secretary – Florence reported the 2019 membership was 266. Renewals are slowly arriving.

Vice President – Jan Kessler was absent. Discussion on need to fill the Vice President office, along with the need to find presenters for educational meeting programs. Discussed the upcoming potluck dinner meeting on Dec. 10th. Jim Hutchings will purchase the meat order, same as order for 2019. Discussed the program for that meeting.

Librarian/Historian – Karla Shannon discussed the VHS tapes she received on making jewelry. She has a total of 18 VHS tapes and it would cost \$20 to get each trans-

ferred to DVD format. It was decided to place them on a table and label them "Free" for members to take at the Dec. Ed. Mtg.

Bulletin Editor – deadline for the December bulletin is Friday, Nov. 29th.

Field Trips – Gene Doyle was absent. 8 attended the field trip to Indian Springs.

Federation Director – Mike Hunerlach was absent. Glenn shared with the group information regarding the CFMS organization. Discussed how they get societies to put on their annual show.

Lapidary Classes – Cathy Nelson reported the wire weave class with Alexis Prince is full. A future class on Viking Knit will be held, taught by Ronnie Goodlund. Discussed the policy of paying ahead of time for a class, to reserve your space. This will be continued.

Show Chair – Jim Hutchings updated those present. Glenn mentioned he can't sign up with the security company until February. The cost might increase.

Lapidary Shop – Denise Coyne shared information about a member who will be at the shop as an instructor, once a week day. This will start after the holidays. She has to collect the oil in the 24" saw and also from the newly donated 24" saw before it can be moved. She will need volunteers to move the newly donated saw over to the saw shed. The old 24" saw will be put up for bidding (on a paper) during the Jan. Ed. Mtg. It was decided that foam should be placed around the exposed water pipes.

Directors – no report.

Juniors – Carole Kowalik reported the Juniors will make a holiday item. They will meet in the Garden Room, instead of the Lapidary Shop. She has a large piece of plywood to donate.

Old Business –

The new storage trailer has all new shelving in place along with the exhibit cases. Not needed exhibit cases are stored temporarily at Kim Loe's house. Insurance has been obtained, \$160 per year. Registration on the old storage trailer is current, to be determined is the location of its "pink slip". When the old trailer is emptied out, photos will be taken and Glenn will see if CFMS wants it to use for Camp Paradise. If not, it can be advertised or taken to a recycle place.

Lapidary Shop Repairs – postponed until after the holidays.

New Business –

New Yellow Business Cards – 1,000 were printed with the new address for the Fairgrounds.

December Board Meeting – it was decided to hold this meeting on Dec. 17th.

CFMS bars and triangles – the order has been placed, we are waiting for Frank Mullaney to get more silver bars.

Tailgater – it was decided to do a tailgater, checking first on a date with the Fairgrounds. The parking lot is used for some events to park busses, etc. Otherwise we should be able to use it.

Adjournment – meeting adjourned at 8:30 p.m.

Respectfully submitted,

Florence Brady, RRR Secretary

December Board Meeting

The meeting will be held Tuesday, December 17 at 7:00 PM in the club Lapidary Shop at the Fairgrounds.



Rookie Rock Roller News



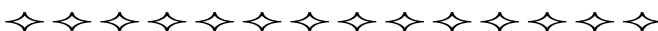
The Rookies will meet Tuesday, December 10, 2019 at 5:30 p.m. We will meet in the Garden Room where the adult education meetings are held, not the lapidary shop. Follow Event Center Drive all the way around to the buildings.

At this December's meeting, we will make rock art which is an activity that counts toward one of your rock hound badges. After the meeting, the juniors stay right there in the same building for the potluck with the adults. Be sure to check out the information on this bulletin so you can see what category of food your family is assigned.

Last month, we learned about metamorphic rock. After that discussion, the juniors went outside to pound on some ugly rocks we intended to toss. Instead we found very nice crystals deep within what looked to be dirt clods.

I hope to see you at the December 2019 meeting.

Carole Kowalik, Junior Advisor
(916) 871-0573 home3004@gmail.com



December Refreshments



It's the Holiday Potluck! Check page 1 to see what item you should be bringing! **Food should be brought in between 6:00 pm and 6:20 pm, because we start serving the food at 6:30!**

The club provides the main meat dishes, but if you are assigned to bring a hot dish/main dish, **what we are looking for is more protein!** Suggestions include: a casserole with ground beef or cheese in it, or a pot of chili, or some meatballs, or a bucket of KFC, etc. Use your imagination!

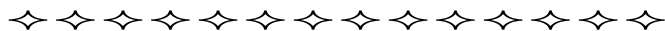
~ 2020 RRR Membership Dues ~

Thanks to those who have already renewed. We really appreciate it.

Membership renewals are being accepted at the December 10th Ed. Mtg./potluck dinner or by US mail to our PO box, 212, Roseville, CA 95678.

Dues paid after December 31st will be subject to a \$5 late fee.

Florence Brady, RRR Secretary/Membership Chair
Terry Yoschak, RRR Treasurer



Sunshine

When you know of any member who is ill or has been hospitalized, please contact our Sunshine Chair, Heather Crane, at (818) 903-4433 or hmcrane7@gmail.com



Lapidary Classes

Lapidary Classes - Introduction to Shop Use & Cabochon making is \$10 per class for 5 classes or \$45 paid in full. Our Shop is staffed Monday & Wednesday nights 5 pm - 9 pm! Learn more about the Lapidary Arts & Cabochon Making. A DVD is available for viewing at the Shop for Cabochon Making.

Regular \$5 per day or \$20 monthly rates apply for lapidary shop use after Orientation/Introduction classes.

Large & Extra Large Saws: \$2 per slab for 18 inch saw & or 24 inch saw for cutting large & extra large rocks.

Crafty Days - Crafty Days is an open get together/play day for anybody wanting to work on their craft while yakking and snacking! We always have fun! Bring whatever you are working on and a snack to share. We meet 1st and 3rd Mondays each month. No class or class fee, \$5 for use of the Shop is the only fee. 10-2pm at the Lapidary Shop.

Crafty Days this month are on December 2 and 16.



(more Lapidary Classes next page!!)

Lapidary Shop News



Hope everyone's had a wonderful Thanksgiving.

We are busy getting the 24 inch saw drained to make room for the one Don Tadlock is donating to us.

Things will be looking up for the Shop after the first of the year. We have a new instructor in training. I will put out more info on her later once she is closer to taking over a day. I'm really excited about getting a new instructor.

The rock shop will be closed the week of Monday December 23 and the week of Monday December 30th. . Reopening Monday January 6th.

— Denise Coyne, Lapidary Shop Director

Wire Weave Medallion Pendant Class

(Just in time to make some great Christmas gifts)

This class is filled, but we are taking names for openings and for the next class.

Our Alexis Prince is going to teach a class on basic wire weaving class at the RRR's Lapidary Shop. at 200 Corporation Yard Rd., Roseville on Saturday, Dec. 7, 2019, from 9 AM to 1 PM.

This class is an introduction to wire weaving. Wire wrapping class familiarity is helpful, but not a requirement.

Please register early as classes can fill up very fast. Prepayment is needed to hold a space in the class for you. Please call Cathy Nelson, the Lapidary Classes Coordinator at 925-321-2024 or email her at canelson2@netscape.net to check if there is space available and for the address to mail the check to.

Each class will be limited to 6 students. The cost for each class will be \$25.00 (which includes the \$5.00 RRR shop fee). A materials list will be sent out to each person that registers for the class. Or the instructor can supply the materials for a fee of \$5.00 (to be paid to the instructor at the class).

If you can, please bring your own wire cutter and bent nose pliers.

* We will NOT be adding the channel set stone seen in the photo in this level class.

Class will review types of wire, tools, planning and process. Goal is to finish the pendant by the end of class to take with you.

(For more examples of wire weaving, go search the internet.)

— Cathy Nelson, Lapidary Classes Chairperson

More Lapidary Classes

Please pre-register with Cathy Nelson, the Lapidary Classes Coordinator 925-321-2024 or canelson2@netscape.net

Intarsia Classes (Offsite)



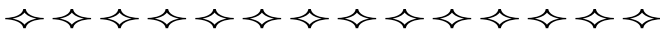
Bill Simpson, whose intarsia work was displayed at our latest RRR Show, is offering intarsia classes at his shop in Meadow Vista.

The classes are two 1/2 days, schedule to be determined.

Fee is \$80.00 which includes \$5.00 to the RRR as a shop fee. Please contact Bill Simpson 408-799-3243.

I have attached a picture of the wonderful intarsia that Bill Simpson does (green one) and a picture that I did (brown one) in his class.

— Cathy Nelson



Thanks to . . .

Darlene Becker for a donation of 4 key chains.

Bill Simpson who did the carpentry in the trailer, Sam Manganello who did the carpentry in the shed.

Colleen & Kelley Ballard, Steve & Kim Loe for moving all the cases to the trailer .



"Stabilized" Turquoise

By Al Pennington, CLGMS

Note: There is very little hard, "gem quality" turquoise on the market. Hence, in most cases, some sort of hardening treatment of this ancient, relatively soft mineral is needed especially for nuggets to help prevent breakage during tumbling and drilling.

Turquoise stone is a hydrous basic phosphate of copper and aluminum which is formed as water trickles through a host stone for about 30 million years, gradually leaving a deposit. If the mix has more copper, the turquoise will be colored in the blue range; if more aluminum, in the green to white range. The addition of zinc yields a yellow-green color and hardens the stone even more. Other colors that appear in a turquoise stone come from the host stone that the turquoise formed in, and are called matrix. A black matrix is usually from iron pyrite; a gold-brown matrix from iron oxide, and a yellow to brown matrix from rhyolite. Matrix that is thin and evenly

Show Trailer Work Party



Hello RRR members:

You may recall hearing, in the recent RRR meetings, updates on the new club show trailer. The cabinetry has been installed thanks to Bill

Simpson and Kelley Ballard and we are ready to move everything from the old trailer: exhibit cases, sawhorses, etc.

We will take exhibit cases and show essentials to the new trailer in Foresthill, useful wood and items to the RRR lapidary shop, and junk to the dump. We need a few people with trucks for hauling.

Trailer Work Party details

When: Saturday Dec 7th starting at 10am

Where: Storage Lot, Extra Space, 540 6th St, Roseville 95678

What: Trucks that can haul items to Foresthill, to the Roseville dump, or to the RRR lapidary shop.

Contact:

Kimberley Loe: 916-220-0122

Kelley Ballard: 916-990-9934

spaced over the surface of the stone is commonly known as spider web matrix. **Spider web matrix** usually enhances the collectability and value of turquoise.

Hardness/Density is a critical factor in determining the grade of a turquoise specimen. An inferior, chalk-like turquoise will feel light; it will be porous and stick to your tongue. The harder, denser pieces will have a "good" substantive feel to them. They will not draw the same quantity of moisture from your tongue as lower grades, but you will feel some adhesion to your tongue. As density increases, so too does hardness. Just as turquoise varies from a little over 2 to nearly 6 on the Mohs scale, its specific gravity also varies but typically is 2.8, like quartz. The grades of turquoise are:

NATURAL: turquoise means a stone with no alteration to its composition. Such stones are merely polished and

(Continued on page 6)

"Stabilized" Turquoise, cont'd

cut into shapes before being mounted in jewelry. Natural turquoise remains porous, as all natural stone is to varying degrees, and may tend to change color over time as it is worn and handled.

STABILIZED: turquoise means that the natural mineral has been chemically altered to harden the stone, usually by infusing epoxy or polystyrene into the porous surface of the stone. The stabilization process serves to freeze the color of the stone so it will not change.

COLOR-TREATED: color-enhanced, or color-infused turquoise means that the natural mineral, usually too soft and pale to finish for use in jewelry, has been chemically altered to change the color of the stone (and often the hardness also). Dye is mixed with a stabilizing epoxy or polystyrene liquid and infused into the stone under pressure.

RECONSTITUTED: turquoise is the name used for turquoise dust and chips that are mixed with plastic resins and compressed into a solid form so as to resemble natural turquoise.

IMITATION or SIMULATED: turquoise is any synthetic compound (usually dyed plastic) which is manufactured to resemble turquoise, but which contains no actual gemstone.

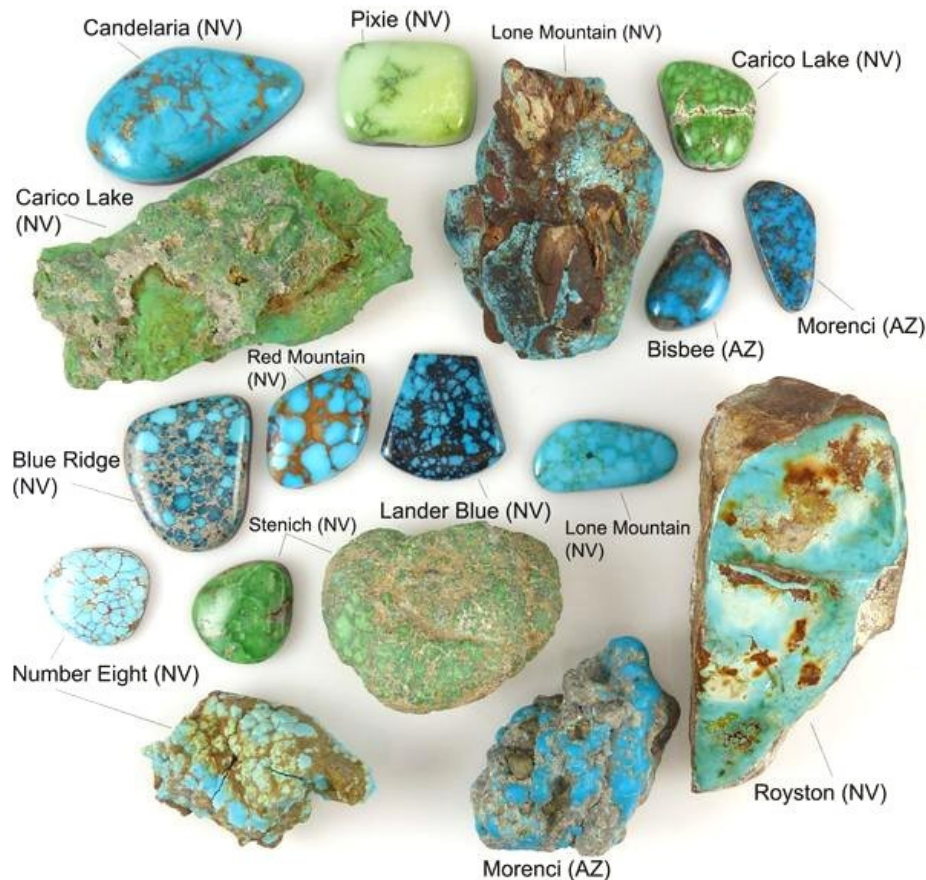
Why stabilize? Seen many an awesome turquoise gem that was full of cracks, pits and the like? To some, as long as it will polish, and it's turquoise, it's a gem. Problem is, most material on the market is too soft to cut, and thereby it won't take a polish. One of the beauties of turquoise, no one cares if it's calibrated, or if there's rough spots in the stone, or if one can't comb their hair in the reflection of the polish.

The term Resin Stabilized is most often used when referring to the process of hardening Turquoise and

like materials which are too crumbly or soft to cut and polish by baking hot resin into the stone to help its hardness. The process is done in an autoclave where resins are injected under heat and pressure. There are many formulas and techniques for stabilizing, many of them considered a trade secret to individual processors. **Stabilized turquoise leaves a slightly waxy surface.**

A similar process is used with the dust of these types of materials to press it into a cuttable block. The best test is to touch the material with a hot pin. You can smell the plastic on a treated piece.

More interesting to the small lapidary is the process called fracture filler. Epoxies are very useful as fillers of small pits or cracks, and most effective to use as a backing to stabilize a fragile piece thought the sawing and grinding process. Best for this is that gray plumbers' epoxy applied



across the back of the slab.

Water glass is a good penetrant and sealer. This is very good to hide internal flaws. It is just as effective as oil to show color and hide the flaws, except more stable as it actually sets up like glue.

Canadian Balsam is very useful as a fracture filler. Pure Balsam is a little complicated in the application, as one needs a vacuum/pressure & heating unit to apply. This can be homemade with parts under \$100 (excluding compressor).

*Via Stoney Statements 3/05
Photo from <https://www.garlandsjewelry.com/blogs/news/what-is-the-difference-between-stabilized-and-natural-turquoise>*

ROSEVILLE ROCK ROLLERS – MEMBERSHIP RENEWAL for 2020

(Please do not add a new member to this form)

If your personal/contact information is the same, just write SAME on this form, under your name(s).

NAME(S) _____

ADDRESS _____

Street

City/State

Zip

PHONE # including area code (_____) _____

E-MAIL _____
(e-mail address will be part of the Club's Membership Roster)

DUES:

Adult (one) Membership \$20.00 per year (receiving bulletin via E-Mail)

Family Membership \$30.00 per year (receiving bulletin via E-Mail)
(2 adults, same address)

Junior Membership \$8.00 per Junior Member

_____ **Amount Paid** **Ck. #** _____

Dues not paid until after December 31, 2019 will be delinquent and an assessment of \$5.00 will be charged. Checks should be payable to RRR or Roseville Rock Rollers.

If paying by US mail, please mail to: Roseville Rock Rollers Gem & Mineral Society
P.O. Box 212, Roseville, CA 95678



December Calendar

Birthstone: Turquoise



Sun	Mon	Tues	Weds	Thurs	Fri	Sat
1	2 Crafty Day 10-2 Lapidary Shop 5:00-9:00 pm Mineral ID	3	4 Lapidary Shop 5:00-9:00 pm	5	6	7 Trailer Work Party 10 am Wire Weave Pendant Class 9 am—1 pm
8	9 Lapidary Shop 5:00-9:00 pm Mineral ID	10 Meetings: Rookies 5:30 pm Club 6:30 pm	11 Lapidary Shop 5:00-9:00 pm	12	13	14
15	16 Crafty Day 10-2 Lapidary Shop 5:00-9:00 pm Mineral ID	17 Board Meeting 7:00 pm	18 Lapidary Shop 5:00-9:00 pm	19	20	21
22	23 Shop Closed	24 	25  Shop Closed	26	27	28
29	30 Shop Closed	31 	January 1 Shop Closed	Shop will reopen Monday, January 6. For more class information, contact Class Coordinator: Cathy Nelson (925) 321-2024 Email: canelson2@netscape.net		

Rock Dating...it's not what leads to all those pebbles!

How do geologists date rocks? Radiometric dating!

Radioactive elements were incorporated into the Earth when the Solar System formed. All rocks and minerals contain tiny amounts of these radioactive elements. Radioactive elements are unstable; they breakdown spontaneously into more stable atoms over time, a process known as radioactive decay. Radioactive decay occurs at a constant rate, specific to each radioactive isotope. Since the 1950s, geologists have used radioactive elements as natural "clocks" for determining numerical ages of certain types of rocks.

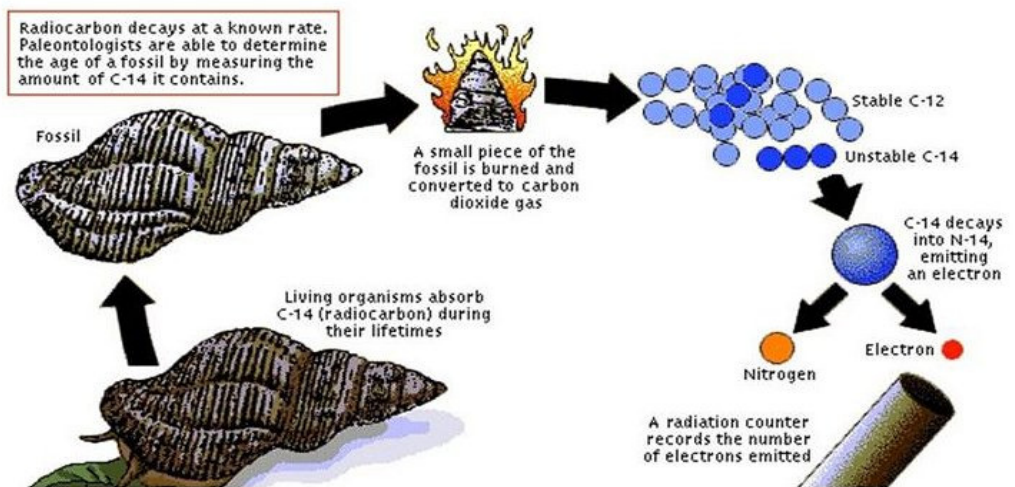
Radiometric clocks are "set" when each rock forms. "Forms" means the moment an igneous rock solidifies from magma, a sedimentary rock layer is deposited, or a rock heated by metamorphism cools off. It's this resetting process that gives us the ability to date rocks that formed at different times in earth history.

A commonly used radiometric dating technique relies on the breakdown of potassium (^{40}K) to argon (^{40}Ar). In igneous rocks, the potassium-argon "clock" is set the moment the rock first crystallizes from magma. Precise measurements of the amount of ^{40}K relative to ^{40}Ar in an igneous rock can tell us the amount of time that has passed since the rock crystallized. If an igneous or other rock is metamorphosed, its radiometric clock is reset, and potassium-argon measurements can be used to tell the number of years that has passed since metamorphism.

Carbon-14 is a method used for young (less than 50,000 year old) sedimentary rocks. This method relies on the uptake of a naturally occurring radioactive isotope of carbon, carbon-14 by all living things. When living things die, they stop taking in carbon-14, and the radioactive clock is "set"! Any dead material incorporated with sedimentary deposits is a possible candidate for carbon-14 dating.

Radiometric dating has been used to determine the ages of the Earth, Moon, meteorites, ages of fossils, including early man, timing of glaciations, ages of mineral deposits, recurrence rates of earthquakes and volcanic eruptions, the history of reversals of Earth's magnetic field, and many of other geological events and processes.

Via *The Rockhound* 9/11
Picture from worldfossilsociety.org/2018/03/wfs-facts-dating-fossils/



Radioactive Dating

Outline the method for dating rocks and fossils using radioisotopes, with reference to ^{14}C and ^{40}K .

Upcoming Northern California Shows

January 18 – 19: EXETER, CA

Tule Gem & Mineral Society, Visalia
Exeter Veterans' Memorial Building
324 N. Kaweah Avenue

Hours: Sat 10 – 5; Sun 10 – 4

Contact: Gayle Bingaman (559) 802-6029

Email: bandgbing@aol.com

Website: tulegem.com

February 15 – 17: ANTIOCH, CA

Antioch Lapidary Club
Contra Costa County Fairgrounds
1201 West 10th Street

Hours: 10 – 5 daily

Contact: Brenda Miguel

Email: brenda.miguel@yahoo.com

Website: antiochlapidaryclub.com

March 21 – 22: SAN JOSE, CA

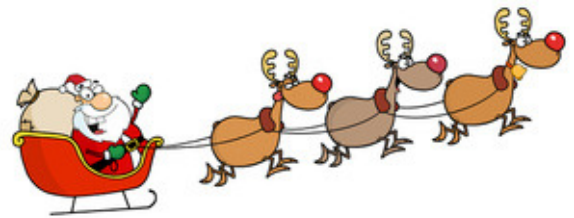
Santa Clara Valley Gem & Mineral Society
Santa Clara County Fairgrounds
344 Tully Road

Hours: 10 – 5 daily

Contact: (408) 265-1422

Email: info@scvgms.org

Website: www.scvgms.org



ROSEVILLE ROCK ROLLERS GEM & MINERAL SOCIETY
BULLETIN EDITOR
P.O. BOX 212
ROSEVILLE, CA 95678

Send exchange bulletins to
above address



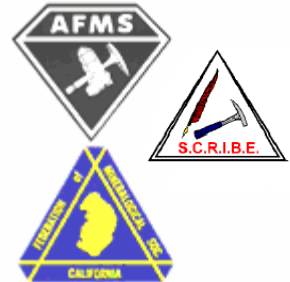
December 2019

*** First Class Mail ***



the
**ROLLIN'
ROCK**

ROSEVILLE ROCK ROLLERS, INC.



**MEMBER, CALIFORNIA FEDERATION OF MINERALOGICAL SOCIETIES
MEMBER, AMERICAN FEDERATION OF MINERALOGICAL SOCIETIES
VOL. 60 NO. 12 DECEMBER 2019**

**EDUCATIONAL MEETING 2ND TUESDAY OF EACH MONTH, 7:00 PM
EXECUTIVE BOARD MEETING 4TH TUESDAY OF EACH MONTH, 7:00 PM**

**EDUCATIONAL MEETING LOCATION: ROSEVILLE FAIRGROUNDS,
JOHNSON HALL, 800 ALL AMERICA CITY BLVD., ROSEVILLE, CA**

Changes and exceptions will be published in the bulletin.
GUESTS AND VISITORS ALWAYS WELCOME