

THE ROCKET

October 2018

deadline for next issue
November 16

Club email: secretary.hrc@gmail.com
Newsletter email: Edrocket18@gmail.com

Future Meetings: We have been officially told that our monthly meetings for Sept/Oct/Nov this year will be on the fourth Friday of those 3 months.

Next Meeting: Friday – October 26 at 7PM
at Hastings Community Center Hall

Social: Please bring a small snack to share at the meeting as there was no sign up

Programs:

The program for **October** will be "Metalsmithing with Mike Ma".
Instructor Mike will give a presentation about our Club's metalsmithing classes and activities.



September's speaker was Jennifer Getsinger, a Professional Geologist and writer who recently retired from the Canadian Geological Survey. Jennifer conducted a "Geology 101 Lab" with 40 or so eager students (see pictures). She started out giving the class a better understanding of the formation of the earth, and why we have basalt underlying the oceans while granite, feldspar, etc. mainly comprise the landforms....to do with the denser basalt sinking (in simple terms). Jennifer later identified rocks and minerals with her students. A most pleasant surprise was that Jennifer



then joined our Club - Bravo and Welcome!

Paul Pinsker gave a short talk on pyrites that appears later in this newsletter.

Thanks Mike for the Photos

WE ARE CELEBRATING! Our Club is 60 this year.

Workshop Hours

* Means a change for fall 2018

Lapidary: Monday 6:30pm – 9:30pm
Wednesday 1:00pm – 4:00pm
Thursday 6:30pm – 9:30pm
Saturday 1:00pm – 4:00pm

Metalwork: * Monday 9am – 2 pm
* Sunday 10:30am – 1:45 pm

Silversmithing: Wednesday 9:00am – 12:00 noon
Saturday 9:00am – 12:00 noon

**Soapstone
Carving:**

Tuesday 6:45 pm – 9:30 pm
There is room for 10 people. Please contact Linda Foy
before showing up for the first time.

PROJECTS

Editor's note: It is the fall and probably many of you are starting some great projects. I hope to have a member's project in each edition. This is our newsletter and I would like it to be about our club. Do you know someone working on (or completed) an interesting project? Please let me know so we can feature their work in our newsletter.

Upcoming Events of Interest:

Shows:

The following clubs are having shows and sales. For more information visit the BC Lapidary Society website or the club websites.

October 27 & 28, 2018, **Port Moody Rock & Gem Club**, Port Moody, BC

November 3 & 4, 2018, **Delta Rockhound Gem & Mineral Club**, Delta (Tsawwassen), BC

December 8, 2018, **Creative Jewellers Guild of BC**, VanDusen Gardens, Vancouver, BC

If you've been out **Rockhounding or on a Field Trip** in the last couple of years and have something to show we'd like to hear about it. You don't have to share your secret site but we'd like to know about your finds. If you do have a place you can tell us about we could have some great club sharing. If you know someone you'd like us to feature, tell me your suggestions and I'll follow up with them. Thanks, Roz (Editor). Edrocket18@gmail.com

Mike Ma sent some photos of a recent find by Nick T. It looks interesting inside and out.



Recent News:

BCLS meeting:

Verne Brooks, Marilyn Sztankovics are our Club Reps at the BCLS. Paul Pinsker, Vivian Rickey and others from our club also attended the meeting. There will be more information at the meeting but Paul reports that our Motion passed. It was moved by Verne, that the BCLS support in principle that a small group of representatives meet with the UBC Pacific Museum of Earth to discuss collaboration on a BCLS-supplied display of specimens provided by member Clubs from across the province, for report back at the next BCLS meeting. Many substantive matters plus details have to be worked out, of course, but we were happy to see it passed unanimously.

The next Rendezvous will once again try for Rock Creek, but not on the May long weekend. Instead, it is to occur June 7-9, 2019. Rendezvous in 2020 is slated for Quesnel. Kelly Stephenson is the new Editor of Rockhounder Magazine. Finally, there were double the previous year's entry in the 2019 Calendar Contest, and the quality shows....Denise Cullen of Port Moody Rock and Gem Club is in charge. Mountain Gem on Hastings in Burnaby and Capilano Gem on Pemberton in North Vancouver are selling them.

Thanks to **Marilyn Sztankovics** for the following report of the talk at the BCLS meeting by **Carl Shearer**.

"Hunting Bacon Agate in the California Desert".

Carl started his talk by explaining his start in rock hounding. Picking up "pretty rocks" in the back alley. The next step was rock hounding and lapidary at the Dunbar Community Centre. Then life intervened and it was dropped till about 17 years ago. Southern California (west of Quartzite) was a distasteful idea for a holiday but once there, he saw large pieces of obsidian lining a driveway. Then he realized there may be something interesting in that hot, dry, dusty desert outside their resort.

The resort was by Salton Sea. Hills of obsidian were available for the digging 5 ATV hours out. Looking over the hills and vales pockets of ash could be seen. By digging in this ash a person could get all the geodes they wanted. All sorts of stones were available but safety was a concern. ATVs were a must – maybe vehicles with a high clearance. They needed lots of water, GPS, food and cell phones (not always good). Safety and survival are key in this area.

This area was originally part of the coast and is still below sea level. There are fossils, caves, and a very large recreation area of sand dunes to be found here. The Colorado River would run down through this area creating valleys and gorges. It was an Aerial gunnery range once. A multi-million dollar aqueduct was built to channel the water to the "big" cities and suburbs. The only thing keeping the Salton Sea from drying up is the run-off from the farmers' irrigation south of the area. An aqueduct carries water from the Colorado River to the farms south of Salton. Sometimes the water flows through the valleys and new things appear. Mostly it is hard digging to get anything. Going in from the east side the bacon agates in all their colours can be found. Carl also had pictures of the wildlife, spiders and lizards. It was an interesting "show and tell" of a Rockhounder's hunting ground

The following is **Paul Pinsker's** talk from our September meeting.

PYRITE

Most of you know something about pyrite, the 1st or 2nd rock you likely collected. There are different kinds of pyrite, including: marcasite, a lighter-toned version of iron pyrite, with identical chemistry but other crystal structure; arsenopyrite (FeAsS), 46% arsenic; and chalcopyrite (CuFeS₂), 35% copper. We are focusing on iron pyrite (FeS₂) *iron disulphide*. It has a common nickname – anyone?

Pyrite elements by weight ~ 47% iron and 53% sulphur.

Moh's hardness 6.0 – 6.5; Specific gravity ~5. Crystallizes: In the cubic form - individual, penetration twin, or clustered; pyritohedral with crystals of many faces, often with 3 or 5 sides each; and, octahedral 8-sided (double tetrahedron). Other forms include: Granular, globular, stalactitic, nodular, radiating (e.g. pyrite suns, occurring in some coal seams), and still others.

Pyrite played important role in human development... Humans began making fire about 1 million years ago, requiring much effort. From ~250 thousand years ago fire became routinely made by striking pyrite with flint tools. This fostered healthier eating, night fires, human interaction, language development, and about 200 thousand years ago migration from Africa.

Pyrite was critical to development of the first complex industrial chemical process: dyeing of cloth. By 2000 BC, when heated with shale and potash, pyrite was oxidized into sulphuric acid, which converted the aluminum in the shale and the potassium in the potash into nearly pure alum, ideal as a mordant for fixing colour to natural fibre. Alum was used by wool-dyers in medieval England and perfected by the 1600s. Thus, pyrite was the key to the birth of the modern chemical industry. Around 300 BC, the Chinese were the first to condense elemental sulphur from heated pyrite, using it for medical purposes. Gunpowder was invented there about 100 AD, and by 1300 Chinese chemists learned how to incorporate sulphur, all extracted from pyrite, to make explosions possible, also igniting the modern arms industry.

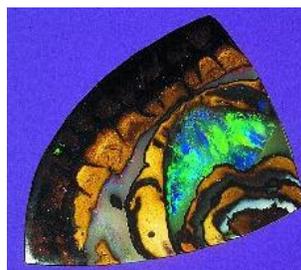
Pyrite played a key role in the development of fertilizer, greatly improving food production in the early 1800s. It remained the primary source of sulphur until 1894, when the French developed a means for extracting it from salt dome deposits. Regardless, pyrite still provided half the world's sulphur until the 1950s.

If you read the September 2018 issue of Rock & Gem, you will learn more about pyrite, such as its role in exploration of North America by gold seekers; and, its environmental pluses (e.g. as a semiconductor helping the solar panel industry, and use in improving rechargeable batteries) and minuses (as a polluter from mining activities and coal burning). Finally, there is the irony that "fool's gold" is now a key factor in gold mining – there are microscopic particles of gold in pyritiferous ores; and, gold sometimes replaces iron in the crystal lattice structure of pyrite.

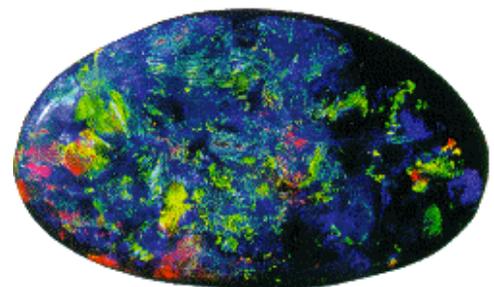
Opal has been the birthstone for October since the 15th century and perhaps even before.



A rough Crystal opal from Coober Pedy



Boulder opal often shows the Matrix



Aurora Australis –Most valuable Black Opal.

Sometimes aquamarine or pink tourmaline is considered the birthstone but we can consider them another time. According to most sources, opal is the stone for celebrating a 14th anniversary but some say it is for the 24th anniversary. Opal is also an alternate for the 18th and 12th anniversaries. It is a good thing there are so many varieties of opal. No zodiac or day of the week claims opal as a birthstone but Wikipedia gives opal as the birthstone for those born at 6 pm.

The name opal has 3 possible sources. In Sanskrit upala means “precious stone”, in Greek Opallios means “to see a change of color” and in Latin opalus means “seeing jewel”.

Opal was known as the “Queen of Gems” because it has the colours of all the other gems. Red is the most highly valued colour, then orange. Fire opal also comes in shades of orange, so we have our theme colour for this month’s newsletter.

In some ancient civilizations, opal was said to have fallen from heaven in flashes of lightening producing its fiery colours. Some believed opal could ward off lightening or grant invisibility (if it was wrapped in a fresh bay leaf and held in the hand). It was also thought that opals had the power to preserve the life and colour of blond hair. Ancient Greeks thought opals gave the gift of prophecy and guarded their owners from diseases especially those of the eye. That was especially true if green was the most prevalent colour in the opal. If red was most prevalent, the opal was believed to stop bleeding like the gem, ruby or emerald, usually associated with the colour.

Opal has been associated with fidelity, assurance, loyalty, faithfulness, love and desire, passion and eroticism. Opal has also been thought to act as an emotional stabilizer! Many cultures have considered opals a symbol of hope.

Because opal can show all colours it has long been held as the luckiest and most magical of all the gems, possessing all the virtues of each gemstone whose colour was shown in the stone. That all changed in 1829 when Sir Walter Scott wrote a book called Anne of Geierstein. A main character in the story died after holy water fell on the opal she wore in her hair. She fell ill and was taken to bed. The next morning all that was left of her was ashes. Readers and others took it that the opal was bad luck for anyone not born in October. Within months the opal market crashed and prices dropped 50%. Between 1796 and 1810, Napoleon Bonaparte gave Josephine an opal, but Empress Eugenie (wife of Napoleon III after 1853) refused to wear the stones. Queen Victoria (between 1876 –1901) laughed at the superstition, and gave opals as wedding gifts to her daughters when they married.

So what is this chameleon rock? It is a solidified gel from silica and about 5-20% water. Gem grade opals usually have 6% to 10% water content. The chemical formula is $\text{SiO}_2 \cdot n\text{H}_2\text{O}$, similar to quartz (SiO_2) but doesn’t form crystals. Opal forms when water, rich in dissolved silicates, gets into a cavity and deposits the microscopic spheres of silicates. If the spheres are uniform in size and shape and neatly stacked, they will diffract light creating colours-precious opals. Often the spheres are random in size, shape, and arrangement so they don’t have the colour play -common opals. The size of the spheres and angle of viewing determines the colour, but the spheres are so small that, according to gemsociety.org, 20,000 spheres are about the size of the period at the end of this sentence.

Opals have a Mohs hardness of 5.5 to 6.5. (Most household dust is a 7 to 7.5 on the Mohs scale.) Opals can be transparent to opaque. Each opal is unique like a fingerprint because of the difference in colour play and pattern of the spheres of silica. Because opals are relatively soft, care must be taken when you own one. Store them away from other jewellery and avoid wearing them where they will get treated roughly. Opals are very heat sensitive. Clean them with warm or room temperature water, mild soap and a soft brush. A toothbrush is too hard so a softer bit of cloth may be better. Don’t use mechanical cleaning systems or steam. Some opals may crack if allowed to dry out too rapidly after being mined. To prevent that it is often recommended to store the stone in moist cotton – not water and definitely not oil or glycerin. Opals may be somewhat porous, so it is dangerous to immerse opals in liquids other than water.

For the lapidary, Opals kept in water must be dried carefully before cutting. Taking it out of water and putting it in a plastic bag for a year – out of sunlight - is one suggestion. There may be other

and even better methods; more research is recommended. Sometimes a stone can become chalk white and lifeless. This may be due to scratches on the surface that destroy the polish and dulls the colour play. Re-polishing can correct this. As opals dehydrate they can develop crazing or cracks or checking (which is cracks on the surface.) These may not be able to be repaired.

According to the Care Guide on gemsociety.org, "Opals are sensitive to shocks from contact as well as scratching, so they're more suitable for pieces like earrings, brooches, and pendants than rings. If you're considering an opal ring, choose a setting in which the metal comes over the opal. However, avoid settings that can put excessive pressure on the opal, such as bezel or prong settings."

To evaluate an Opal five steps are taken: determining the **type** of opal, examine the **colour play**, the **transparency**, the **clarity**, and the **cut**. Opals are rarely faceted and often cut in irregular shapes to preserve as much of the valuable colour-play part of the stone as possible.

There are 6 main types of opals. "Common opal" comes in a variety of colours and refers to opaque or glassy opals with a waxy luster. They do not have any colour play. Common opals are often fluorescent. The other 5 types are Gem Opals: White Opals, Black Opals and Crystal Opals occur in small seams in sedimentary rock. Boulder Opal occurs in thin layers between layers of hardened sandy clay. Fire Opal occurs as pebbles within old lava flows.

- White or light opal: translucent to semi-translucent, with play-of-color against a white or light gray background color, called the bodycolour.
- Black opal: translucent to opaque with play-of-color against a black or other dark body colour.
- Crystal or water opal: transparent to semitransparent, with a clear background. This type shows exceptional play-of-color.
- Fire opal: transparent to translucent, with brown, yellow, orange, or red body color. This material, also known as "Mexican opal," often doesn't show play-of-color. It is often faceted.
- Boulder opal: translucent to opaque, with play-of-color against a light to dark background. Fragments of the surrounding rock, called matrix, become part of the finished gem.

The colour play of opals involves looking at the percentage of colour and the patterns that can show. This is where people will discuss pinpoint, harlequin or other patterns of colour. If a particular shape is seen in the colour pattern it is considered a more valuable stone. Larger patches of colour are better too.

We often discuss treatments of the gem stones. We've already mentioned concerns with water, oil and glycerin. But some ways lapidaries use thin pieces of opal can be useful. These pieces can be attached to a backing, as in a **doublet** or have a cover of quartz added to protect the thin layer of opal, as in a **triplet**. These are considered lesser stones than the solid opal, but can be useful in creating jewellery such as rings which will get harder wear. Care must be taken not to soak these pieces as the glue between the layers can separate. Sometimes these added layers will be made of plastic so the buyer needs to know what they are getting. Doublets and Triplets allow the beauty of the opal to show, and allows thin pieces of opal to be used, at a fraction of the price of solid opal.

Imitation opals have been made using Slocum stone, a man-made glass that gives a play of color. Chips of opal and colored plastic are also put into hollowed rock crystal, and an imitation opal from Gilson Laboratories uses silica spheres. A jeweller can spot these imitations with their equipment. A lay person can use heat to melt plastic or spot a mesh-like appearance to the colour play in imitations. As new imitations are created new methods of spotting them emerge.

As early as 4000 BC tools of opal were used in northern Africa. Since Roman times the gem opals from Eastern Europe were the most highly prized until opals were discovered in Australia in the 19th

century. Now, Australia is the best known area for producing opals but Ethiopia is gaining a greater market share. Brazil also produces some good quality White Opal. Common opal is found around the world.

In North America, Mexico produces Fire Opal which is often known as "Mexican Opal". Louisiana produces the Louisiana Sand Opal that is a sandstone/quartzite with opal cement and matrix. Spencer, Idaho produces a rare Star Opal (the star is created by the order of the spheres not inclusions like happens in Sapphire). There is also a lot of thin vein opal that is useful in doublets and triplets. According to Gemmology Canada, Gemstones of British Columbia By Stephen Bertalan, A.G. (C.I.G.) (cigem.ca) " Common opal occurs in seams of rock outcroppings north of Princeton, and also in tertiary rocks at Savona Mt., Agate Mt., Horse Fly River, Fourmile Cr., and Slocan Lake." Fire Opal has been found along the banks of Deadman Creek but only a few locations of precious opal are found in BC - perhaps Eagle Creek near Burns Lake and on a mountain west of Penticton. Outside Vernon opal is mined commercially. In the past there were some concerns with cracking. I could not find recent information about the site.

There are some notable specimens amongst opals. The "**Aurora Australis**" (See Beginning of the article) was found in 1938 at Lightning Ridge , New South Wales, Australia. It weighs 180 carats. and is 3 inches by 1.8 inches. Dug from an old sea-bed it has the distinctive impression of a star fish on its back.



"**Olympic Australis**" was found at a depth of 30 feet near Coober Pedy, Australia in 1956. Uncut it is 127 oz. and named in honour of the Olympic Games that were being held in Melbourne. Currently it is in Sydney, Australia.

The **Andamooka Opal** was discovered in Andamooka, South Australia and after cutting and polishing it weighs 203 carats. It was set with diamonds

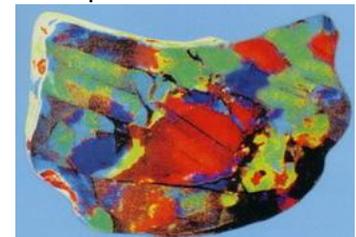


into an 18 karat palladium necklet and presented to Queen Elizabeth II in 1954 on her first visit to South Australia.



Red Admiral or Butterfly was found in Lightning Ridge, Australia. It is 40-50 carats rough. Many regard this as the world's most beautiful opal.

Pride of Australia was found in 1915 in Lightning Ridge, New South Wales, Australia. It was 2 inches x 3 inches and 225 carats, partly cut. It was stolen from the owner in Los Angeles in 1961.



The **Galaxy** is certified by the Guinness Book of World Records (1992) as the world's largest polished opal. It was found at the Boi Morto Mine in north eastern Brazil in 1976. It is part of a private collection. The finished opal weighs approximately 3,749 carats. It was carved into a shape resembling a child's head.