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◆ **The Council Reporter** ◆

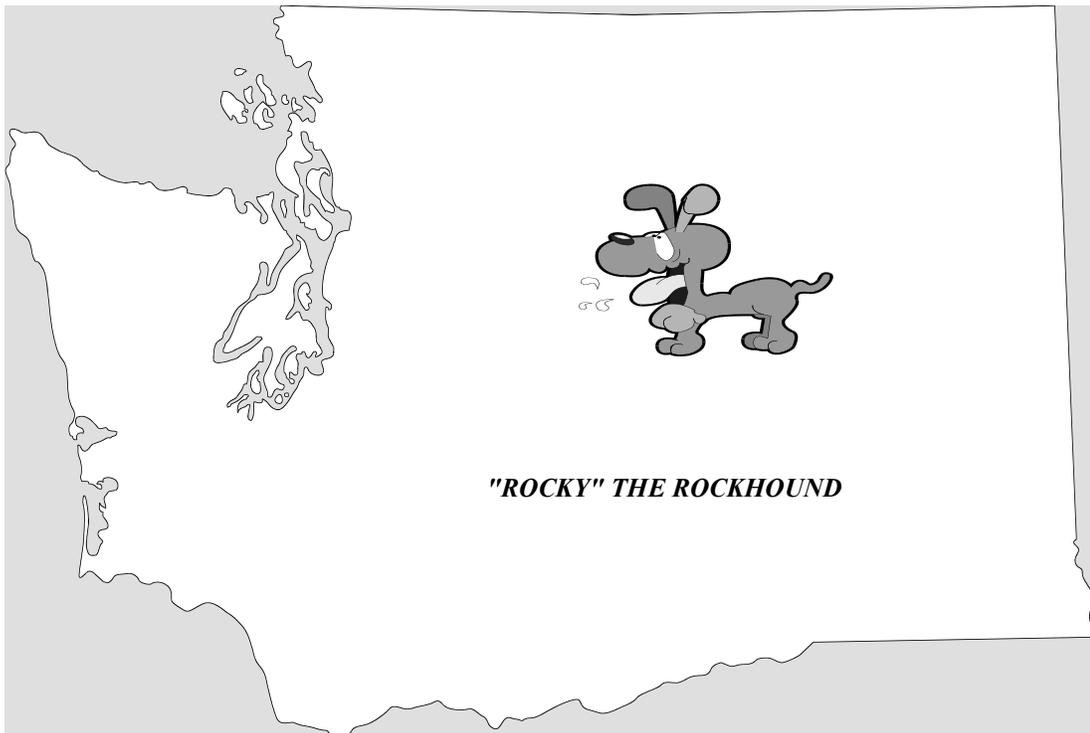
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**Official Publication of the  
Washington State Mineral Council**

**WASHINGTON STATE MINERAL COUNCIL  
2018 OFFICERS**

**OFFICERS**

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Barbara (Bobbie) Premo	(17-18-19)
Gilbert Trujillo	(19-20-21)
Cheryl Ellicott-Jones	(18-19-20)

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Wagonmaster	open		

**The West Side Board meets the third Tuesday of each month between combined meetings, unless a special meeting is called. Usually no meeting in July and December dependent on Board action.**

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The old URL [www.mineralcouncil.org](http://www.mineralcouncil.org) will continue to re-direct you to the new location.

**New e-mail address: [mineralcouncil@zoho.com](mailto:mineralcouncil@zoho.com). Please update your address books.**

There are no minutes for the January meeting as only three people made it to meeting place.

I will send out a reminder prior to the next meeting to make sure everyone is notified.

Glenn Morita

### **A quadrillion tons of diamonds lie deep beneath the Earth's surface**

Written by Ayana Archie Ralph Ellis, CNN

<https://www.cnn.com/style/article/diamondsunder-earth-surface-trnd-style/index.html>



Credit: Donald Bowers/Getty Images North America/Getty Images for Sotheby's

As it turns out, diamonds in the Earth are much more common than we thought. About 1,000 times more common, according to the Massachusetts Institute of Technology. A new study by an interdisciplinary team of researchers used seismic technology (the same kind used to measure earthquakes) to estimate that a quadrillion tons of diamonds lie deep below the Earth's surface. That's 1,000,000,000,000,000 --- or one thousand times more than one trillion.

Don't expect a massive diamond rush, though. The deposits sit some 90 to 150 miles below the Earth's surface, much deeper than current mining machinery allows. The Mir Diamond Mine in Russia, for instance, is the world's second-largest human-made hole and only goes about a third of a mile deep.

Seismic technology uses sound waves to make measurements, because their speeds change depending on the composition, temperature and density of the rocks and minerals they're traveling through.

Deep in the earth are cratons, masses of rock shaped like upside-down mountains. They are usually cooler and less dense than surrounding rock and result in faster sound waves.

But scientists observed that the waves got even faster when moving through the bottom of the cratons, known as their roots. So they put together virtual rocks, made from potential combinations of materials, and using three-dimensional models, compared the velocities of sound through the variations. Sound travels through diamond twice as fast as other rocks, so

## **February 19, 2019 Westside Board Meeting AGENDA**

Opening of Meeting  
Treasurer's Report  
◇ Kathy Earnst  
Committee Reports  
◇ Wagonmaster -Ed Lehman  
Old Business  
New Business  
Open Comments  
Adjourn

### **Meeting Calendar for 2019**

West side board meetings:  
01/15, 02/19, 03/19, 05/21, 07/16, 11/19 (if needed)

At 7:30PM at the  
Maplewood Clubhouse  
8802 196th St SW, Edmonds

General meetings :  
04/06, 06/01, 09/28, 10/26

All general meetings will be held at:

Palace Café  
4th & Main  
Ellensburg  
Meeting @ 9:30 AM

### **GPS Co-ordinates Needed**

The WSMC needs the GPS co-ordinates of any and all of the collecting sites in the state. In an effort to make the map booklets as accurate as possible the Mineral Council is asking for everyone to record GPS readings while on field trips. The data can also be used to help in our fight to keep our collecting areas open.

### **Dues are due**

Download the PDF or Word version from the WSMC website in the Misc. Resources menu.

Please send the dues and form to Kathy Earnst

27871 Minkler Road  
Sedro Woolley, WA 98284

the team of researchers figured there had to be some of the material in the cratons.

"Diamonds are a perfect match because they're a little bit more dense, but we don't need a lot of them," said Ulrich Faul, a researcher in MIT's Department of Earth, Atmospheric, and Planetary Sciences and a senior participant in the study. Faul, who worked in the lab with a team of seismologists, geochemists and other scientists, slightly increased the amounts of diamond in the virtual rocks, until they reached a combination that produced the same advanced speeds they'd been encountering by using seismic technology on the real Earth.

That amount was 1-2% of the craton. Next, the team multiplied this percentage by the total volume of cratonic roots in the Earth, estimated by thorough mapping of new and old rock formations. They came up with one quadrillion. That's at least 1,000 times more diamonds than scientists had expected.



Faul said the location of the diamonds at the base of the cratons makes the most sense, as diamonds are formed via extreme pressure and extreme heat, so the weight from all the rock above provides ideal conditions for their formation deep in the Earth's mantle.

The diamonds that end up in necklaces and rings come closer to Earth's surface, usually through volcanic eruptions, Faul told CNN.

The study also included researchers from various national and international institutions, including the University of California at Berkeley, Harvard University, the University of Melbourne and the University of Science and Technology of China, among others.

Via SMRC Rock Talk, July/August 2018



## Largest Natural Diamond in North America Just Found

by Kat Koch

The Canadian mining company, Dominion Diamond Mines, has just discovered the largest natural diamond ever found in North America. This newest diamond is 552 carats and measures 33.7 mm x 54.56 mm and was dug up from Diavik Mine. This is the same mine where the previous largest North American diamond was found. The 187.7 carat Diavik Foxfire Diamond. This diamond is now the 2nd largest North American diamond ever discovered.

Via CSME Tumbler 12/18

## Virgin Valley Opals

by Evelyn Cataldo

Hidden in the high desert region of the northwest corner of Nevada, lies the famous Virgin Valley precious opal mines. The area is famous for black opal, known to occur in only two places on Earth: Virgin Valley, Nevada and New South Wales, Australia.

It is believed that this area was once a large lake surrounded by a forest filled with a variety of tree species. Over time the forest was devastated by a series of volcanic eruptions. Twigs, limbs and rotting wood collected in the coves of the lake. The forests, the lake and the driftwood were buried under layer after layer of ash. The buried wood decayed and left cavities.

Over millions of years, heat and pressure filled the cavities with silica that percolated through the ash; gradually hardening into opal. Under the right conditions, precious opal was formed. Over time, the entire area has been uplifted and eroded, exposing the opal deposits. It is said that it took Mother Nature twenty million years to make a Virgin Valley black opal.

The Virgin Valley area has been inhabited by man for more than 10,000 years. In the southwestern portion of the valley lies the "Last Supper Cave". Its bones and artifacts have been carbon dated to 10,000 to 12,000 years.

There is evidence that the Chinese sent an expedition to mine the precious black opal approximately 4,500 years ago. During the late 1800s and early 1900s a few specimens were collected by cowboys and shearers.

These specimens were reported to the press and soon prospectors found their way to Virgin Valley. Opals were first mined commercially in the area in 1905 with the discovery of the Bonanza Mine. Other early mining operations included the Rainbow Mine.

Both are still in production today.

Most of the opal found in Virgin Valley is in the form of replaced wood and limb casts. Opalized bones of vertebrate animals have also been found, as well as opalized bark, roots, pine cones and seeds. The opals are found in layers of clay. The precious opal bearing layers may be as much as 10-30 feet be-

low the surface and range in thickness from 2-12 feet. Common opal is abundant throughout the layers of clay and ash, but only specific conditions produced the precious opal.

Anything that resembles petrified wood should be carefully examined and kept. Look for specimens that are glassy looking.

The background color does not matter. Some of the most beautiful opal specimens do not show color immediately. Collect everything glassy looking, black, clear, milky, brown, etc. Sometimes, good pieces of opal are covered with a white, chalky coating. A small percentage of the opal found in Virgin Valley is valued at more per carat than diamonds. Keep your eyes open for other fossils and artifacts.

Virgin Valley is high desert. Expect warm days and cool nights. Be prepared with a variety of clothing, plenty of liquids, sun screen, hat, and chap stick. Food, fuel and lodging can be found at Denio, Nevada (35 miles away).

Dry camping is available at the CCC campground with is about five miles from the mines. The campground is free. There are no hookups but outhouses are available, a shower room and swimming in the hot spring. There are fire pits for the cool evenings, but you need to bring your own wood.

Other items you will find useful are a small pick, small garden rake, small shovel, spray bottle with water, a bucket for sitting on, gloves and some zip lock bags to store your specimens.

The opal mines at Virgin Valley are fee dig areas. Some mines allow digging through the tailings, some allow digging in the clay wall and Rainbow Ridge offers loads of virgin material. Prices range from \$50 per day for going through tailings to \$400 for a load of virgin material.

via CSME Tumbler, 12/18, Golden Spike News, 3/18; from The Geode, 4/07

### This Gemstone Switches Colours in an Instant

<http://www.geologyin.com/2018/01/this-gemstone-switches-colours-in.html>

Hackmanite is an important variety of sodalite.

Photochromism is a process that can be described as a change of color upon exposure to light. A mineral that possesses this property is said to be photochromic. The phenomenon was discovered in the late 1880s, including work by Markwald, who studied the reversible change of color of tetrachloronaphthalen.

That's when the color changes from exposure to light, like self-adjusting sunglasses. Several other stones will do this but hackmanite, especially some of the varieties from Afghanistan and Burma, carries this effect to extremes as you can see pale blue to deep purple.

Technically, photochromism is defined as "the reversible transformation of a chemical species between two forms by the ab-

Before exposure Sunlight



After exposure Sunlight



sorption of electromagnetic radiation, where the two forms have different absorption spectra." But the term has been loosely adopted in mineralogical circles to mean the reversible change of color of a mineral upon exposure to a particular type of light.

The term "tenebrescence" also means the reversible change of color of a mineral upon exposure to a particular type of light. Tenebrescence is from the Latin "tenebrae" for shadows.

Tenebrescence refers to a reversible color change in which certain minerals darken or change color in response to radiation of one wavelength and lighten or change back to their original color upon exposure to a different wavelength. These changes usually take effect with exposure to Shortwave UV, Longwave UV and sunlight.

It seems the term tenebrescence is being replaced by photochromism. Whether you call a mineral tenebrescent or photochromic, they both roughly mean the same thing. This effect

### The Washington State Mineral Council web site has MOVED.

Please update your web browsers to the new URL <https://mineralcouncil.wordpress.com/>. The old URL [www.mineralcouncil.org](http://www.mineralcouncil.org) will continue to re-direct you to the new location.

**New e-mail address: [mineralcouncil@zoho.com](mailto:mineralcouncil@zoho.com). Please update your address books.**

The Mineral Council e-mail account has been moved to a new host. Please update your address books as the old e-mail account has been closed

### Attention: All Newsletter Subscribers

**If you, or someone you know should be receiving this newsletter electronically and are not, please contact Bob Pattie or myself (Glenn Morita).**

**We are trying to keep our mailing list current and want to make sure that everyone who wants an electronic version of the newsletter gets one.**

can be repeated indefinitely, but is destroyed by heating. Tenebrescent minerals include the Hackmanite variety of Sodalite, some Scapolites and Tugtupite.

White Hackmanite, from a few sources, may turn raspberry red after exposure to shortwave UV light and the color fades rapidly in sunlight. A recent find of colorless Scapolite from Badkshshan, Afghanistan changes to a saturated, medium blue when exposed to shortwave UV light.

When the shortwave UV light is removed the stones immediately begin to fade and return to colorless within a few minutes. Tugtupite will darken in color from light pink to deep rose red when exposed to shortwave UV light and fade back to light pink when removed from the UV light.

Other minerals may change color or lose color when exposed to certain types of light but the change is permanent. These minerals may also be called "photochromic" by some. Joel Arem, in the Color Encyclopedia of Gemstones, describes Proustite as a photochromic gem because it can permanently turn dark or even black with prolonged exposure to light. This is also true of Pyrargyrite. Both minerals suffer from this effect because of their silver content. Silver was used in early photographic processing for this reason.

In Kunzite, the pink variety of Spodumene, the pink color may fade with prolonged exposure to light. This has earned Kunzite the nickname of the "evening stone" since wearing it during daylight hours is not recommended. Maybe these minerals should be termed "irreversible" photochromic minerals - but that would be an oxymoron since "photochromic is defined as "reversible".

Article from <http://www.geologyin.com/2018/01/this-gemstone-switches-colours-in.html>

Via Hard Rock New, 01/19

### Agate - Ayurvedic Birthstone:

Agate /'æɡət/ is a rock consisting primarily of cryptocrystalline silica, chiefly chalcedony, alternating with microgranular quartz. It is characterized by its fine-ness of grain and variety



of color. Although agates may be found in various kinds of host rock, they are classically associated with volcanic rocks and can be common in certain metamorphic rocks.

The stone was given its name by Theophrastus, a Greek philosopher and naturalist, who discovered the stone along the shore line of the river Achates (Greek: Ἀχάτης) in present-day Sicily, sometime between the 4th and 3rd centuries BC.[3] Colorful agates and other chalcedonies were obtained over 3,000 years ago from the Achates River, now called Dirillo.

Agate is one of the most common materials used in the art of hard-stone carving, and has been recovered at a number of ancient sites, indicating its widespread use in the ancient world; for example, archaeological recovery at the Knossos site on Crete illustrates its role in Bronze Age Minoan culture.

Most agates occur as nodules in volcanic rocks or ancient lavas, in former cavities produced by volatiles in the original molten mass, which were then filled, wholly or partially, by siliceous matter deposited in regular layers upon the walls. Agate has also been known to fill veins or cracks in volcanic or altered rock underlain by granitic intrusive masses. Such agates, when cut transversely, exhibit a succession of parallel lines, often of extreme tenuity, giving a banded appearance to the section. Such stones are known as banded agate, riband agate and striped agate.

In the formation of an ordinary agate, it is probable that waters containing silica in solution—derived, perhaps, from the decomposition of some of the silicates in the lava itself—percolated through the rock and deposited a siliceous gel in the interior of the vesicles. Variations in the character of the solution or in the conditions of deposition may cause a corresponding variation in the successive layers, so that bands of chalcedony often alternate with layers of crystalline quartz. Several vapour-vesicles may unite while the rock is still viscous, and thus form a large cavity which may become the home of an agate of exceptional size; thus a Brazilian geode lined with amethyst and weighing 35 tons was exhibited at the Düsseldorf Exhibition of 1902. Perhaps the most comprehensive review of agate chemistry is a recent text by Moxon cited below.

The first deposit on the wall of a cavity, forming the "skin" of the agate, is generally a dark greenish mineral substance, like celadonite, delessite or "green earth", which are rich in iron probably derived from the decomposition of the augite in the enclosing volcanic rock. This green silicate may give rise by alteration to a brown iron oxide (limonite), producing a rusty appearance on the outside of the agate-nodule. The outer surface of an agate, freed from its matrix, is often pitted and rough, apparently in consequence of the removal of the original coating. The first layer spread over the wall of the cavity has been called the "priming", and upon this base, zeolitic minerals may be deposited.

Many agates are hollow, since deposition has not proceeded far enough to fill the cavity, and in such cases the last deposit commonly consists of drusy quartz, sometimes amethystine, having the apices of the crystals directed towards the free space so as to form a crystal-lined cavity or geode.

When the matrix in which the agates are embedded disintegrates, they are set free. The agates are extremely resistant to weathering and remain as nodules in the soil, or are deposited as gravel in streams and along shorelines.

Via Stone Age News, 05/18

## Local Area Shows for 2019

February 2019 9th 9am—5pm 10th 9am—4pm	Whidbey Island Gem Club	54th Annual Sweetheart of Gems Show	Oak Harbor Senior Center 51 SE. Jerome Street Oak Harbor, WA
February 2019 22nd 9:30am – 5:30pm 23rd 9:30am – 5:30pm 24th 9:30am – 5:30pm	Oregon Agate and Mineral Society	OAMS Gem and Mineral Show	OMSI 1945 SE Water Avenue Portland OR 97214
March 2019 2nd 10am - 6pm 3rd 10am - 5pm	Owyhee Gem & Mineral Society	65th Annual Rock and Gem Show	O'Conner Field House 2200 Blaine Caldwell, ID
March 2019 2nd 10am - 6pm 3rd 10am - 5pm	East KingCo Club	Annual Rock and Gem Show	Pickering Barn 1730 10th Ave NW Issaquah, WA
March 2019 8th 8:30am - 6pm 9th 9am - 5pm	Panorama Gem and Mineral Club	Annual Show	Colville Fairground Colville Ag and Trade Center 317 West Astor, Colville, WA
March 2019 8th 10am - 5pm 9th 10am - 5pm 10th 10am - 5pm	Tualatin Valley Gem Club	61st Annual Rock and Mineral Show \$1 adults, 12 and under free	Forest Grove National Guard Amory2950 Taylor WayForest Grove OR
March 2019 9th 10am - 5pm 10th 10am - 4pm	Magic Valley Gem Club	69th Annual Show	Twin Falls County Fairgrounds 215 Fair Ave. east of Filer on US Hwy. 30
March 2019 9th 9am - 6pm 10th 10am - 5pm	Northwest Montana Rock Chucks	Gold, Gem, and Mineral Show	Flathead County FairgroundsExpo Building (next to grandstands)265 North Meridian RoadKalispell MT
March 2019 16th 9am - 6pm 17th 10am - 5pm	Hellgate Mineral Society	Missoula Gem & Mineral show \$2, under 14 free w/adult	Hilton Garden Inn 2730 North Reserve St. Missoula MT
March 2019 29th 10am – 6pm 30th 10am – 6pm 31st 10am – 4pm	Rock Rollers Club of Spokane	60th Annual Gem, Jewelry and Mineral Show Adults \$6, Scout in uniform and children under 12 free	Spokane County Fair & Expo Center N. 604 Havana Spokane WA
March 2019 30th 10am - 6pm 31st 10am - 5pm	Mt. Baker Rock & Gem Club	58th Annual Rock and Gem Show	Bloedel-Donovan Park 2214 Electric Ave. Bellingham WA
March 2019 30th 10am—6pm 31st 10am - 5pm	Sweet Home Rock & Mineral Society	71st Annual Rock & Mineral Show “Petrified Wood”	Sweet Home HS Activity Gym 1641 Long St. Sweet Home, OR
March 2019 30th 10am—5pm 31st 10am - 5pm	SE Idaho Gems & Mineral Society (SEIGMS)	63rd Annual Rock and Gem Show \$2, 12 & under free/adult	Bannock County Fairgrounds 10588 Fairground Dr. Pocatello ID 83201
April 2019 6th 9am - 5pm 7th 10am - 3pm	Springfield Thunderegg Rock Club	62nd Annual Rock and Mineral show	Willamalane Adult Activity Center 215 W C Street Springfield OR
April 2019 13th 9am - 5pm 14th 10am - 5pm	Maplewood Rock and Gem Club	April Sale	Maplewood Rock and Gem Clubhouse 8802 196th ST SW Edmonds WA
April 2019 13th 10am - 5pm 14th 10am - 4pm	Lakeside Gem & Mineral Club	Annual Rock & Mineral Show \$5 adults, 12 & under free	Benton Franklin County Fairgrounds 1500 S. Oak Kennewick, WA
April 2019 13th 10am - 6pm 14th 10am - 5pm	Idaho Falls Gem & Mineral Society	55th Annual Show	Idaho Falls Recreation Center B Street Idaho Falls, ID

Westside Board Meeting  
February 19, 2019  
7:30 PM

**Maplewood Clubhouse**  
**8802 196th St SW**  
**Edmonds**

COUNCIL REPORTER, Monthly publication of The  
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