

# LAPHOUND NEWS

VICTORIA LAPIDARY & MINERAL SOCIETY

PO Box 48164 Uptown PO  
Victoria, BC V8Z 3L0



**Volume 61-4 :: Nov 2018**

**Website :: [www.vlms.ca](http://www.vlms.ca)**

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## VLMS Committees

<b>Programs :</b>	vacant	
<b>Librarians :</b>	Christine Patton	<a href="mailto:christinegems@gmail.com">christinegems@gmail.com</a> (604-537-9170)
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<b>Refreshments:</b>	Barb MacKenzie	<a href="mailto:barb.mackenzie@shaw.ca">barb.mackenzie@shaw.ca</a> (250-727-0954)
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<b>Editor:</b>	Gary Brooke	<a href="mailto:gab.bns@gmail.com">gab.bns@gmail.com</a> (250-475-3440)
<b>Sunshine Corner:</b>	Susannah Andersen	<a href="mailto:johnsusannah@telus.net">johnsusannah@telus.net</a> (250-812-9303)



# The Newsroom

## Announcements

### Club Contact Information

Victoria Lapidary & Mineral Society has a new (centrally located) mailing address. The old mailing address is still active as we relay the new information to our business contacts, but please, from this time forward send any mail correspondence to:

**VLMS**  
**PO Box 48164 Uptown PO**  
**Victoria BC**  
**V8Z3L0**

### Community Interaction: Tillicum Community Elementary School

The club has received a request from Program Coordinator (Dianne) at Tillicum Community Elementary School for assistance with a science-based after-school program. To date, one club member has volunteered to help out but we are hoping that the club might provide multiple learning opportunities for this school program. They are hoping for regular dates and programs for the next winter term (January to March) that would be anywhere from 2-8 sessions (1 class/week) in length. Members that can spare a small bit of time to help educate and encourage the students, should contact Vanessa – any assistance will be much appreciated.

### Club Events

#### *December's Christmas Special*

The December 3rd meeting date is wholly devoted to our annual Christmas Social Festive. The club will supply turkey and pork but members and guests are encouraged to bring a vegetable, appetizer or dessert entre to share. Also, please remember to bring your own plates and eating utensils, as well as a wrapped gift for gift exchange, if you would like to participate. Gifts are suggested to be of approximately \$10 in value, gift-wrapped and should be gender neutral. A box will be made available for those who also would like to bring a non-perishable food item for the food bank. Any questions, please direct to the VLMS mailbox, [vlms@vlms.ca](mailto:vlms@vlms.ca)

## ***Annual General Meeting***

A reminder that our Annual General Meeting is to be held on January 7, 2019 at the Les Passmore Senior Centre (\*\*\*\*please note the location change; it is next door to our usual meeting place\*\*\*\*). This meeting is an important one since it involves the election of the club's Board of Directors and the placement of the Appointed Positions. Several Board and Appointed positions are up for renewal; some positions currently have members willing to renew their position and some do not (a list is provided below). Please contact vlms@vlms.ca if you are interested in supporting our club by volunteering for one of these roles.

### **Elected positions:**

**President:** no nominations at present

**Vice President:** currently nominated - Allana (incumbent)

**Secretary:** no nominations at present

**Treasurer:** currently nominated - David Jackson (incumbent)

**Membership:** no nominations at present

**Members At Large:** no nominations at present (2 positions)

### **Appointed Positions:**

**Sunshine Corner:** currently standing - Susannah Andersen

**Library:** currently standing - Kathryn Ann Hawkins

**Programs:** no volunteers at present

**Newsletter:** currently standing – Gary Brooke

**Webmaster:** currently standing – Becci Simmons

**Field Trips:** no volunteers at present (Note: after 25 years, Gilles has indicated that he is ready to step down as our wagonmaster but he is willing to work with anyone wanting to take up this position)

## ***2019 VLMS Rock and Gem Show – Leonardo Da Vinci Centre – March 15-17, 2019***

It is never too early to start getting ready for our Annual Show. Mark it in your calendars and stay tuned as to how you can help make our annual, hosted event to continue to be a show-stopping success. Planning meetings have already started – to volunteer to help out, contact Allana.

## **Meetings**

The next “meeting” is wholly devoted to the Christmas club social and will be held as follows:

**Date:** Dec 3, 2018

**Place:** Burnside Lawn Bowling Clubhouse, 274 Hampton Road, Victoria, BC

**Time:** 6:30 pm (doors open) with a sit down meal for ~7:00 pm.

## **Field Trips**

None scheduled (as is normal for this time of year). However, there continues to be some discussion about a Frazer River trip - unfortunately we have not been able to arrange any dates as yet. Any updates will be sent out to the club membership, from the board, via the VLMS mailing list. Also, at the last Member's meeting the idea that we should have a club camping trip was put forward. Possible locations include the northern part of Vancouver Island and/or the smaller Gulf Islands. Interested Members should contact the VLMS executive with their ideas.

## **Courses**

Next courses tentatively scheduled for the New Year.

## **Reports**

### **President (Vanessa)**

As 2018 draws to a close, I reflect back to the year we have had as a club and as a collective like-minded rock-loving people. With Allana's lead, and the help of many awesome member volunteers, we successfully hosted another very successful March Rock and Gem show (including managing to fill in some late vendor vacancies). In addition, we hosted an excellent Gemboree which helped us initiate new rock-related friendships, discover wondrous new locations and acquire a few more treasures along the way. Finally, we conducted a third successful Rough-to-Ready rock fair that gave all participants an opportunity to interact with even more like-minded individuals that share our passions of rock, crystals, fossils, minerals and gems. Perhaps, most importantly, our membership has grown to more than 200 members this year and I am confident, under the new leadership, in the next year we will connect with even more. I wish you all a safe holiday season and look forward to seeing many of you at our annual Christmas Winter Festive on Dec. 3rd and at the Annual General Meeting on Jan. 7th.

### **October Members' Event, "Rough to Ready" in R'October (Allana)**

Our third annual Members' Event took place on the weekend of Oct 13th and 14<sup>th</sup>, 2018 at the Da Vinci Center in Esquimalt. Over 500 people attended and had the opportunity to interact with the largest turnout of vendors yet (for this particular event). For the first time, this year's Members' Event received the full endorsement of the club thereby allowing some of the arrangements to be accounted for in club business. For example, we had a small advertising budget, we brought in a steady number of clients, and we also had a "Grilled to the Mac" food truck parked on site (for the convenience of both vendors and visitors). Despite competing with a marvelous weekend of weather, the show was a great success. I am so very thankful to our volunteers and vendors who brought their own tables as we ran short due to the large number of vendors. Door sales brought in about \$1200 for the club. Looking ahead, we have already arranged for the second weekend in October 2019 for the next Members' event - we will continue to offer unusual talents and rough material to support our hobby. In an attempt to grow the event, we will aim for a larger advertised budget to reach a higher number of rock and gem enthusiasts.

### **Membership (Margaret)**

I am pleased to report that our club membership has reached 228 individuals (191 adults and 37 juniors) with a demographic breakdown as follows:

- a) 87 singles,
- b) 34 couples,
- c) 2 single-parent families (with 5 juniors), and
- d) 17 two-parent families (with 32 juniors).

As we are just over a month from the expiration of memberships I must report that only 28 renewals out of the 140 memberships (comprising the 228 individuals quoted above) have been received to date. Anyone wishing to renew can drop into the workshop during open hours, pay at the meeting Dec. 3<sup>rd</sup> or mail payment to VLMS, P O Box 48164, Uptown, Victoria, V8Z 3L0. Anyone wishing to

purchase a Directory should add \$5.00 to your payment – They are usually delivered to the club in March.

### **Field Trips (Gilles)**

Field trips have been concluded for the fall season. The schedule for the spring will be announced in the New Year - as always, field trips are weather dependent.

### **Sunshine Corner (Susannah)**

New members Amber and Everitt Lansdell recently experienced some misadventure involving a fall and, as a result, spent some time in the Victoria General Hospital. The good news is that they are back at home and are on the mend – we wish them both a speedy and full recovery.

### **Library (Kathryn)**

We have many items for sale including Crests, Pins, Stickers, and select issues of the B.C. Rockhounder Magazine (spring 2018, winter 2017, fall 2017 and summer 2017). Note, your purchases help support the VLMS. Please return any outstanding library books, Lapidary Journal or Rock and Gem issues to the Library. We will be opened for business again during the January Annual General meeting. If you have an item on loan, and wish to keep it out longer please let me know.

### **Island Zone (Vanessa)**

The next Island Zone meeting is on Sunday December 2nd from 12noon to 2 pm at the Bayside Cafe (upper mezzanine) on Cliffe Avenue in Courtenay. If you have any interest in attending any of these meetings, please contact one of your current Island Zone representatives: Vanessa Steffens, David Jackson, or Sarah Hamilton. Note, past Island Zone reports are available in our member's section of our website.

### **Workshop (Vanessa)**

All machines are working well and we are looking forward to receiving our new (to us) trim saw, donated to the club from a contact associated with Allana. One basic lapidary course is currently finishing up and that may be the last lapidary course until the New Year as with December brings year-end workshop cleaning duties which will occur on December 27th and 29th. Please do not plan on coming to workshop these two days unless you are prepared to help clean. The workshop will be open both Thursday evenings and Saturdays during regular workshop time up until the 22<sup>nd</sup> of December; we will resume the regular schedule again on January 3<sup>rd</sup> 2019, under new management. Brian McMillan will continue in his equipment manager role and Doug McLeod has stepped up to replace Vanessa Steffens as regular use workshop manager. If anyone else is interested in workshop management volunteering, please forward your interests to the vlms@vlms.ca mailbox. Please confirm that you would be available all days required as this responsibility is not a casual role.

### **Editor (Gary)**

Most of the information presented in these newsletters is solicited. Unsolicited contributions are welcome – contact gab.bns@gmail.com. A quick glance at the above section on “Elections” reveals that several positions on the VLMS executive (and appointed positions) need to be filled. Volunteering is always a bit daunting and intimidating – yet without volunteers this club would not exist. Too often, clubs like the VLMS, rely upon a few people to do all the work – it is exhausting! Take that first step and volunteer to pitch in and help out.

## Fun Facts

### *Lappy the Lapphound*

"All that glitters isn't gold  
....but it might be opal!!!!



### *Foxy the Foxhound*

"Diamonds are a girls' best friend  
....cubic zirconia... not so much!!!!



## Cool Cats

It was an exciting day for Foxy as she waited in her condo with Dotty and Pippa. Two very dear friends, Twiggy and Dot, were coming to visit from North Vancouver for a girl's weekend of shopping and fun. It was an unusual relationship to be sure - formed during her university days when Foxy spent some time in Vancouver, but it had endured. Unusual for a couple of reasons; first, Twiggy and Dot were cats, and second, Twiggy<sup>1</sup> and Dot<sup>2</sup> weren't just any cats, they were Sphynx<sup>3</sup> cats. They had bonded with Foxy whilst taking a mineralogy<sup>4</sup> course at UBC – they too, were eager for the reunion. Foxy did not want to reveal Twiggy's and Dot's feline ethnicity to Dotty and Pippa – she wanted to see their reactions. Dotty was ambivalent towards the visit (as usual) but Pippa ...not so much (surprise, surprise)!

**Pippa:** "Why is the heat turned up so high in here? I am not going to lie ... I don't like cats – they are always hissing".

**Foxy (laughing):** "Oh com'on Pippa...these girls are lots of fun and you will love them".

**Dotty:** "When do they arrive?"

Just then Foxy's cell phone chimed with an incoming text.

**Foxy (excited):** "They are here – they just got dropped off via taxi".

She went to the front door, opened it and stood in the hallway waiting for the elevator doors to open. Pippa and Dotty stood behind her in full anticipation. The elevator "dinged", the doors opened and out stepped Twiggy and Dot. Twiggy was in black and Dot was in blue. Foxy rushed forward and embraced each in turn.

**Foxy (almost in tears):** "I am so glad you came...it has been far too long since I saw you last".

**Twiggy (emotional):** "You look marvelous"

**Dot (mischievously):** "I agree, Foxy, you are glowing....is there something you haven't told us?"

Meanwhile, Pippa and Dottie were still standing in the condo doorway.

**Pippa (gasped and then whispered to Dottie):** "OMG..what are they?"

**Dottie (giggling):** "Cats....and cool ones at that!"



**Figure 1. Twiggy and Dot arrive at Foxy's condo.**

Foxy brought her guests forward to her apartment.

**Foxy :** "Twiggy, Dot, I want you to meet my best friends: Pippa and Dottie"

**Twiggy (politely):** "How do you do. Foxy has told us a lot about you both. Pippa, I absolutely adore your "puffs" and Dottie your dark fur is even more gorgeous than Foxy has described".

**Dot (interjecting with a giggle):** "Hello to you both, but Twiggy and I are quite jealous – we would love to have just one "puff" or sleek black fur. Alas, it is not to be".

**Pippa (completely disarmed):** "Please come in where it is warm... it can be breezy in the hallway".

**Dottie (admiring the girl's outer garments):** "Did you girls make your own coats?...they are very chic"

**Twiggy (laughing):** "Oh, goodness no...we get our stuff custom made through the Marlene's boutique in North Van. She has been very accommodating".

**Dot (not so sure):** “Overall she has been pretty good...it did take her awhile to fix the collar on my Cashmere – my skin is quite sensitive”.

**Pippa:** “I absolutely adore your travel bags!!”

**Foxy:** “Well, you both certainly look healthy and happy”

**Twiggy (inquisitively):** “So Foxy, what is the source of your .... ‘glow’?”

**Pippa (interjecting):** “The big news is that both Foxy and Dottie are in love”.

**Dot (excited):** “What!! Give us the details, please”.

**Foxy (blushing):** “Well.....I have met a guy, his name is Lappy, he is totally cool and shares many of my interests – just recently, he became a member of the local K9 police force and has had many exciting adventures already. He is away this weekend”.

**Dottie (proudly):** “My guy is the head of the K9 unit, his name is Fin, and he is not only very handsome, but he is extremely smart – whatever case they are looking into, you can be assured that Fin has it under control.”

**Twiggy and Dot (together):** “Wow, that is so exciting!! ..... what about you Pippa?”

**Pippa (uncomfortable with the attention shifted to her):** “I am happy without any guys in my life, thank you very much”.

**Dottie (to laughter):** “Me thinks she is a bit too fussy!!”

**Foxy (to Twiggy and Dot):** “What about you two...any guys on the horizon?”

**Twiggy (somewhat downcast):** “I am seeing a guy but it is a long distance relationship and doesn’t seem to be going anywhere...he lives in Calgary, is a bit rough around the edges but he is nice ... he just doesn’t seem to want to evolve into anything that might result in commitment”.

**Dot (likewise pessimistic):** “My parents will have nothing to do with any guy who isn’t a Sphynx...there’s just not a lot of Sphynx guys out there....I am totally bummed out by it all”.

**Foxy (realizing it was time to change the subject):** “Hey, do you girls ever venture out to the UBE’s (short for UBC where they took their mineralogy course and, specifically, a course on crystallography<sup>5</sup>)?”

**Twiggy:** “Not very often...I still have nightmares about crystal form<sup>6</sup> and habit<sup>7</sup>”.

**Dot (playfully):** “It was a very difficult course...we wouldn’t have got through it without you Foxy. I bet you don’t remember all of the crystal systems<sup>8</sup> and their associated symmetry classes<sup>9</sup>”.

**Foxy (defiant to the end):** “Well of course I don’t but I do remember that ‘form’ relates to specifics of the crystal structure like Miller indices<sup>10</sup> whereas ‘habit’ refers to outward appearance of the crystal - for example, terms like drusy<sup>11</sup>, tabular<sup>12</sup>, and encrusting<sup>13</sup> are used to describe crystal habit”.



Twiggy and Dot were impressed as always with Foxey's cerebral capacity and although Pippa and Dottie were usually impressed, in this case their eyes were starting to glaze over – they couldn't believe anyone could be interested in such things.

**Pippa:** "I thought we were going shopping".

**Dottie:** "Now we are talking about a topic I like".

Twiggy and Dot had a giggle at that response.

**Foxey (laughing):** "We are going shopping later after we have some tea ....we are going to visit a new rock and gem shop that has opened up in Oak Bay!"

**Pippa and Dottie (in chorus):** "Oh no!!!"

The girls had some tea and small cakes that Foxey had prepared. They caught up on all the gossip including some of the antics of the guys. Finally, Pippa grew weary of all the guy talk and had to remind them of the time. Rather than put on her collar, Foxey adorned herself with her blue topaz<sup>14</sup> necklace; Pippa was wearing her collar adorned with aquamarine<sup>15</sup> and bloodstone<sup>16</sup> while Dottie wore her collar with the tourmaline<sup>17</sup> tassels. One of the reasons that Foxey wanted to visit the new store was to see if they could find some sort of be-jeweled necklaces or collars for both Twiggy and Dot. They all bundled up and left the condo, hailed a cab, and headed to Oak Bay. They were going to Divine Gems – a small shop specializing in gems, rocks and jewelry – it had only been open for a few months. The girls entered the premises. Since it was a Saturday, both Anoush and his wife, Fatima (a UVic professor), were working the shop. Anoush was at the back of the shop polishing a piece of stichtite<sup>18</sup> on his Genie machine. Fatima was sitting behind the counter (also towards the back of the shop behind the display tables) – she peered over the counter as this unusual group of visitors entered the establishment.

**Fatima (whispering):** "Anoush, come quickly, you have to see this!"

Anoush came forward to the counter – he realized that he had three canine visitors but couldn't quite identify the two smaller ones. In fact, he couldn't quite decide whether the two small visitors were canine or feline – he suspected they were feline, but he had never seen a Sphynx in the flesh (so to speak) before now.

**Fatima:** "Hello and welcome to our store".

**Foxey (stepping forward):** "Thank you, I am Foxey and these are my friends Pippa, Dottie, Twiggy and Dot. Twiggy and Dot have come all the way from the Lower Mainland for a girls' day of shopping. We thought we would come and check out your new store".

**Anoush:** "Why thank you. Was there anything that you were looking for in particular?"

**Foxey:** "Well, as you can see, I, Pippa and Dottie all have gemstones in some fashion around our necks but my feline friends Twiggy and Dot do not. We hope to find something to rectify that situation".

**Fatima (to Foxey):** "You have a beautiful necklace, is that a blue Topaz?"

**Foxy (proudly):** “Yes, it is”.

**Pippa (not one to take a back seat):** “Dottie and I have our birthstones on our collars”.

**Dottie (also felt the urge to speak):** “I also have some jade<sup>19</sup> charm bracelets for my ankles, but I am not wearing them today”.

**Pippa (giving Dottie a sideways glance):** “Dottie, no one cares about your charm bracelets that you are not even wearing!”

Anoush was relieved that Foxy’s comment confirmed his suspicions about Twiggy and Dot – it could have been a bit awkward had she not done so. He was slightly amused by the interaction between Pippa and Dottie.

**Anoush (to Twiggy and Dot):** “Can you tell us your birth months? Perhaps we can find something that you might like”.

**Twiggy:** “I was born in December”.

**Dot:** “My birthday is in May”.

**Fatima (to Twiggy):** “The birthstone for December is Lapis<sup>20</sup> – a stone that we specialize in. I think we will find something for you”.

**Anoush (to Dot):** “The traditional birthstone for May is Emerald<sup>21</sup>. We do have some rough emerald-bearing stones but I don’t think they are what we are looking for. However, agate<sup>22</sup> and carnelian<sup>23</sup> are also thought of as birthstones appropriate for May. I do have some beautiful yellow agate from Russia that might work. I also have some carnelian stones – they are quite pretty in the light as they seem to glow”.

**Foxy (to Anoush):** “You certainly have a lot of lapis... it is so beautiful. How did you come to specialize in this gorgeous stone?”

**Anoush (matter of factly):** “I literally had a dream about lapis one night – it changed our lives”.

**Dottie (unabashedly):** “I dream about Fin all of the time”.

**Pippa (slightly embarrassed for Dottie):** “Too much information!!”.

**Foxy (browsing around):** “Wow, these red garnet<sup>24</sup> crystals are the biggest I have ever seen – and is this green obsidian<sup>25</sup>?”

**Anoush:** “Yes, black obsidian is most common. However, depending upon impurities, it can be different colors. We were fortunate to be able to bring in this green color – it is quite rare”.

**Twiggy:** “What are these wood things?”

**Fatima:** “Those are Flower of Life Crystal grids<sup>26</sup>. They are made locally and each is quite unique”.

**Dot:** “They are interesting. Are they some sort of spiritual thing?”

**Fatima:** “Yes, many people derive spiritual benefits from crystals and gemstones. The grids can be used to place one’s crystals or stones in an ordered fashion so as to heighten the experience”.

**Dottie (interjecting):** “The only thing I believe in is Fin”.

**Pippa (to much laughter):** “Dottie, I think you need some crystal grid therapy!”

After much discussion and back and forth the girls decided they would purchase a beautiful Lapis cabochon for Twiggy and a gorgeous yellow agate cabochon for Dot. The girls could have commissioned Anoush to make the settings, however, they decided instead that it might be more prudent to get that done at home (in Vancouver) after deciding how best to match their respective wardrobes. They thanked Anoush and Fatima and left the store.

**Pippa and Dottie (in unison):** “Can we go clothes shopping now!!!”


With that, this unusual group went off to explore some of the Oak Bay boutiques.


## **Acknowledgements**


Once again I would like to thank all those members who contributed to this Newsletter – it continues to be only as useful and complete as the information you provide.

# Appendix


## Twiggy and Dot


1.  Twiggy is patient (to a point), laid back and somewhat aloof. She splits her time between N. Vancouver and Calgary – she is an experienced traveller (as evidenced by her travel ensemble to the left). She knows when and what she wants to eat and can be vocal about it if necessary.

2.  Dot is a bit younger than Twiggy and tends to be a bit impetuous as a result – she can be a bit of a trouble maker and annoyingly insistent. She is curious but nervous around strangers. Dot has a voracious appetite and that might be because she is constantly on the go.....until she drops...that is,

3.  Sphynx is a breed of cat known for its lack of coat (fur). It was developed through selective breeding, starting in the 1960s in Toronto , Canada. The skin should have the texture of chamois, as it has fine hairs, or they may be completely hairless. They also have a narrow, long head, and webbed feet. Their skin is the color that their fur would be, and all the usual cat markings (solid, point, van, tabby, tortie, etc.) may be found on the Sphynx cat's skin.

## Fun Facts - Rocks and Gems (all material obtained from the web!!)

4.  Mineralogy is a subject of geology specializing in the scientific study of the chemistry, crystal structure, and physical (including optical) properties of minerals and mineralized artifacts. Specific studies within mineralogy include the processes of mineral origin and formation, classification of minerals, their geographical distribution, as well as their utilization.

5.  Crystallography is the experimental science of determining the arrangement of atoms in crystalline solids. Crystallographers use the properties and inner structures of crystals to generate knowledge that is used by chemists, physicists, biologists, and others. Within the past century, crystallography has been a primary force in driving major advances in the detailed understanding of materials, manmade and otherwise.

6.



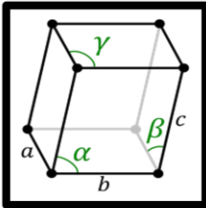
Crystal form refers to a set of crystal faces that are related to each other by symmetry. The number of faces in a form depends on the symmetry of the crystal. In a 'general form' of a particular crystal class, faces intersect all crystallographic axes at different lengths. All other forms that may be present are called 'special forms'. A closed form is a set of crystal faces that completely enclose space whereas in an open form they do not.

7.



Crystal habit is the visible external shape of a set of crystals. This is determined not only by the crystal structure (which restricts the possible facet orientations), but also by the specific crystal chemistry and bonding (which may favor some facet types over others), and the conditions under which the crystal formed. In nature perfect crystals are rare. The faces that develop on a crystal depend on the space available for the crystals to grow.

8.



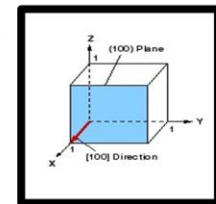
Crystal systems refer to one of several classes of space groups, lattices, point groups, or crystals. Informally, two crystals are in the same crystal system if they have similar symmetries. Space groups and crystals are divided into seven crystal systems according to their point groups – triclinic (seen to the left), monoclinic, orthorhombic, tetragonal, rhombohedral, hexagonal, and cubic.

9.



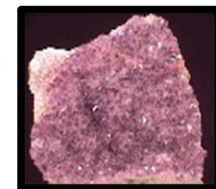
Crystal symmetry classes are determined by the 32 possible combinations of symmetry operations that define the external symmetry of crystals. Each crystal class will have crystal faces that uniquely define the symmetry of the class. Visualization of crystal symmetry is difficult. Terms such as pinacoidal, sphenoidal, and Rhombic-pyramidal all refer to specific crystal symmetry classes. Left is an illustration of tetrahedral symmetry.

10.



Miller indices are a set of three numbers h, k, and l that are used to define families of lattice planes in a crystal form. Crystal structure is difficult to visualize and requires mathematical constructs that are not familiar to the layman. Miller indices help to simplify the process of distinguishing between crystal structures. Left illustrates the plane in a cubic system associated with the [1,0,0] Miller indices.

11.



Druse is a term used to describe outwardly oriented crystals usually lining the inside of a geode, but may also apply to other outwardly oriented crystal coatings. Amethyst typically forms aggregates that are a good example of this type of crystal habit.

12.



Tabular crystal habits are typically formed by plate-like crystals, thin in one dimension i.e., crystals are flat and plate-like. They have lengths and widths that are much larger than their thickness. Barite crystals are often tabular in nature.

13.



Encrusting crystal habits typically form as a thin crust of crystalline material over host rock. Sometimes they are derived from evaporation, efflorescence or simple precipitation. Left illustrates an aragonite crystal that is a good example of this form.

14.



Topaz - is a silicate material of aluminum and fluorine. Pure topaz is colorless and transparent but impurities cause it to occur in a variety of colors. Topaz is commonly associated with silicic igneous rocks e.g., granite. Topaz can be found worldwide, including locations in Utah and Texas; Brazil is the world's leading producer.

15.



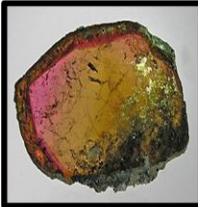
Aquamarine (March birthstone) is a blue or cyan variety of beryl. It occurs at most localities which yield ordinary beryl i.e., Sri Lanka. Brazil, Madagascar and in Wyoming and Idaho here in North America. The pale blue color of aquamarine is attributed to  $\text{Fe}^{2+}$  whereas  $\text{Fe}^{3+}$  ions produce golden-yellow color. When both  $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$  are present, the color is a darker blue as in maxixe. Note Fe refers to iron.

16.



Bloodstone is a heliotrope that is a variety of jasper or chalcedony. It is typically green jasper (chalcedony) with red inclusions of hematite (the blood). Bloodstone has been referred to as the “stone of Babylon” in reference to several magical properties (stone of invisibility), creator of rain and solar eclipses.

17.



Tourmaline (October birthstone) is a crystalline boron silicate mineral compounded with elements such as aluminium, iron, magnesium, sodium, lithium, or potassium. This brightly colored Sri Lankan gem is identical, minerally, to *shorl* and has special pyroelectric properties that enable it to attract and then repel hot ashes. This unique property led the mineral to be known as the Ceylonese Magnet. It is an established semi-precious gemstone.

18.



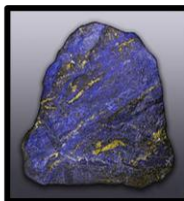
Stichtite is a mineral, a carbonate of chromium and magnesium. Its colour ranges from pink through lilac to a rich purple colour. It is formed as an alteration product of chromite containing serpentine. It occurs in association with barbertonite, chromite and antigorite.

19.



Jade is an ornamental rock, mostly known for its green varieties, which feature prominently in ancient Asian art. The term *jade* is a general term applied to two different metamorphic rocks that are composed of different silicate minerals, namely (i) jadeite, and (ii) nephrite. Jade has been a favorite carving material for many centuries.

20.



Lapis lazuli or lapis for short, is a deep blue metamorphic rock used as a semi-precious stone that has been prized since antiquity for its intense color. As early as the 7th millennium BC, lapis lazuli was being mined in northeast Afghanistan. Today, operational mines are found in Afghanistan, Pakistan, Russia, Chile, Italy, Mongolia, US and Canada.

21.



Emerald is a gemstone and a variety of the beryl (beryllium (Be) aluminum silicate) mineral group. It is colored green by trace amounts of chromium (Cr) and sometimes vanadium (V). Emeralds are found worldwide but the main deposits are found in Columbia, Brazil, and Zambia.

22.



Agate is a rock consisting primarily of cryptocrystalline silica, chiefly chalcedony, alternating with microgranular quartz. It is characterized by its fineness of grain, layering 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..

23.



Carnelian is a brownish-red mineral commonly used as a semi-precious gemstone. Carnelian is a variety of the silica mineral chalcedony colored by impurities of iron oxide. The color can vary greatly, ranging from pale orange to an intense almost-black coloration. It is most common in Brazil, India, Siberia and Germany.

24.



Garnets are a group of silicate minerals that have been used since the Bronze Age as gemstones and abrasives. All species of garnets possess similar physical properties and crystal forms, but differ in chemical composition. The different species are pyrope, almandine, spessartine, grossular, uvarovite and andradite.

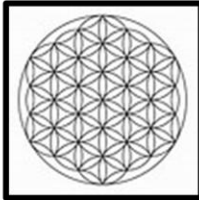


25.



Obsidian is a naturally occurring volcanic glass formed as an extrusive igneous rock. Obsidian is produced when felsic lava extruded from a volcano cools rapidly with minimal crystal growth. Obsidian is hard and brittle and therefore fractures with very sharp edges. In the past it was used to manufacture cutting and piercing tools and it has been used experimentally as surgical scalpel blades.

26.



Crystal grids have been defined as a “geometric pattern of energetically aligned stones charged by intention, set in a sacred space, for the purpose of manifesting a particular objective.” The intent is to intensify the spiritual or healing experience associated with individual stones by putting them together in an array.