# Voice of the Dinosaur

Newsletter of the
Kawartha Rock and Fossil Club

*April 2013 ~ Volume 25 ~ Issue 4*



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## LAST REGULAR MEETING
## March 12, 2013

**The meeting was chaired by the President, Robert Montgomery. Committee reports were given and approved.**

**There was some discussion concerning the purchase or rental of a metal detector and/or geiger counter. The Field Trip Co-Ordinator, Ulrike Kullik will look into this and bring a recommendation to the next meeting.**

**An open discussion centered around how to make the meetings more interesting to members and guests. One suggestion, that met with unanimous approval, was to limit the amount of business conducted at meetings. Much business could be handled in Executive meetings with only a quorum of Executive members present. It was further suggested that it might be possible to hold Executive meetings online via the Club Web site. This subject will be pursued by the President and results brought back to a future regular meeting.**

## NEXT REGULAR MEETING

**Date - April 9, 2013**
**Place - Orientation Centre, Peterborough Zoo**
**Time - 7:00 pm**
**Agenda - Regular business meeting**
**Presentation -**
**Done Dole Jr. is an avid field collector of mineral specimens and has collected in many localities, locally and abroad. Don brings a witty, but always friendly approach to his talks. His topic will be - "The use of Geiger counters and radioactive minerals". His passion for and knowledge of his topic is sure to impress you.**

**Bring in your suspected specimens to be tested.**

**Tom Jenkins will hold a silent auction.**

## MESSAGE FROM THE PRESIDENT

**Greetings all, especially to non members who may be reading this for the first time. I extend a friendly invitation to you to contact me, or any other member, with questions you might have about our Club. I invite you to attend one of our meetings, there's no better way to satisfy your interest in minerals and/or fossils than to just jump in and experience all the Club has to offer.**

**To those many members that do not normally come out to the meetings, I would like to extend a warm welcome to join us as we renew efforts to finding ways of making our Club meetings an enjoyable event you would not what to miss.**

**Come out and make this Club all that you want it to be!**

## THE FOSSIL CORNER

### Blastoids

**By Kevin Kidd**

**Blastoids are an extinct class of animals within the phylum Echinodermata, and as such, are related to starfish, sea urchins and crinoids. Blastoid comes from the Greek "blastos" meaning bud or sprout. As you read that first couple of sentences, is it becoming obvious that I start with the same article over and over and just change the necessary words??? The most common name for these creatures is "sea buds". The most common genus of blastoid, *Pentremites* (Figure 1) looks similar to a hickory nut so they are also often referred to as "fossil nuts".**

**The entire class is extinct, ranging from the Ordovician to the Permian, with their greatest diversity coming in the Mississippian (early Carboniferous).**

**Blastoids are believed to have evolved from the cystoids. In addition to the "nut" shape, they can be found in conical, cylindrical, globular and other forms (Figures 2-3. Figures 4-5 next page).**

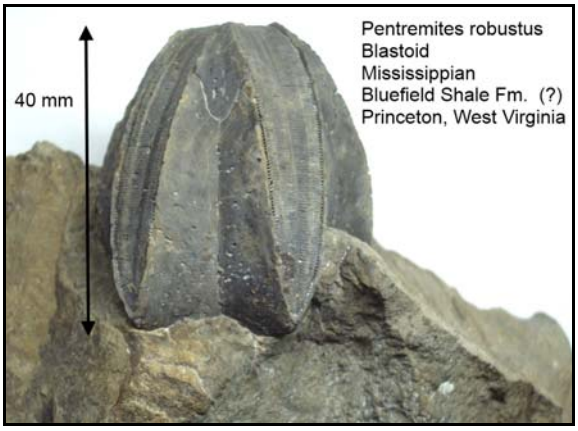


**Figure 1.**
***Pentremites robustus***
**As the name suggests, I believe this is the largest species of blastoid.**


**Figure 2.**

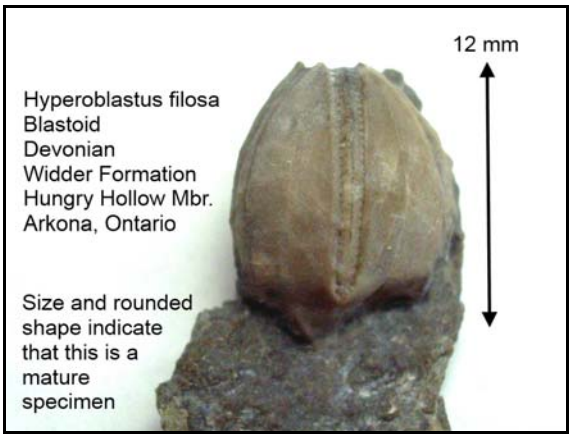


**Figure 3.**

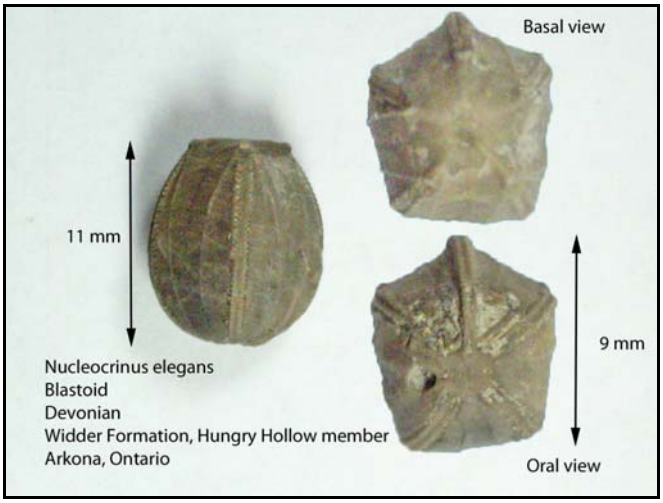


**Figure 4.**

**Figure 5.**
***Orophocrinus stelliformis***
**Mississippian age from the Burlington formation in Hannibal, Missouri. 3.2 cm across. This species is on my want list.**

**Most blastoids had a short stem made up of stacked disks, similar to crinoids and cystoids. If it's possible to differentiate between what animal a specific disk belonged to, it's well beyond my knowledge. If a stem was present, it attached to the sea floor with a holdfast, but some species were stemless and had the holdfast at the end of their body. Unlike most echinoderms, blastoids were very regular in structure. The main body, or theca, was comprised of tightly integrated plates of calcium carbonate (Figure 6).**

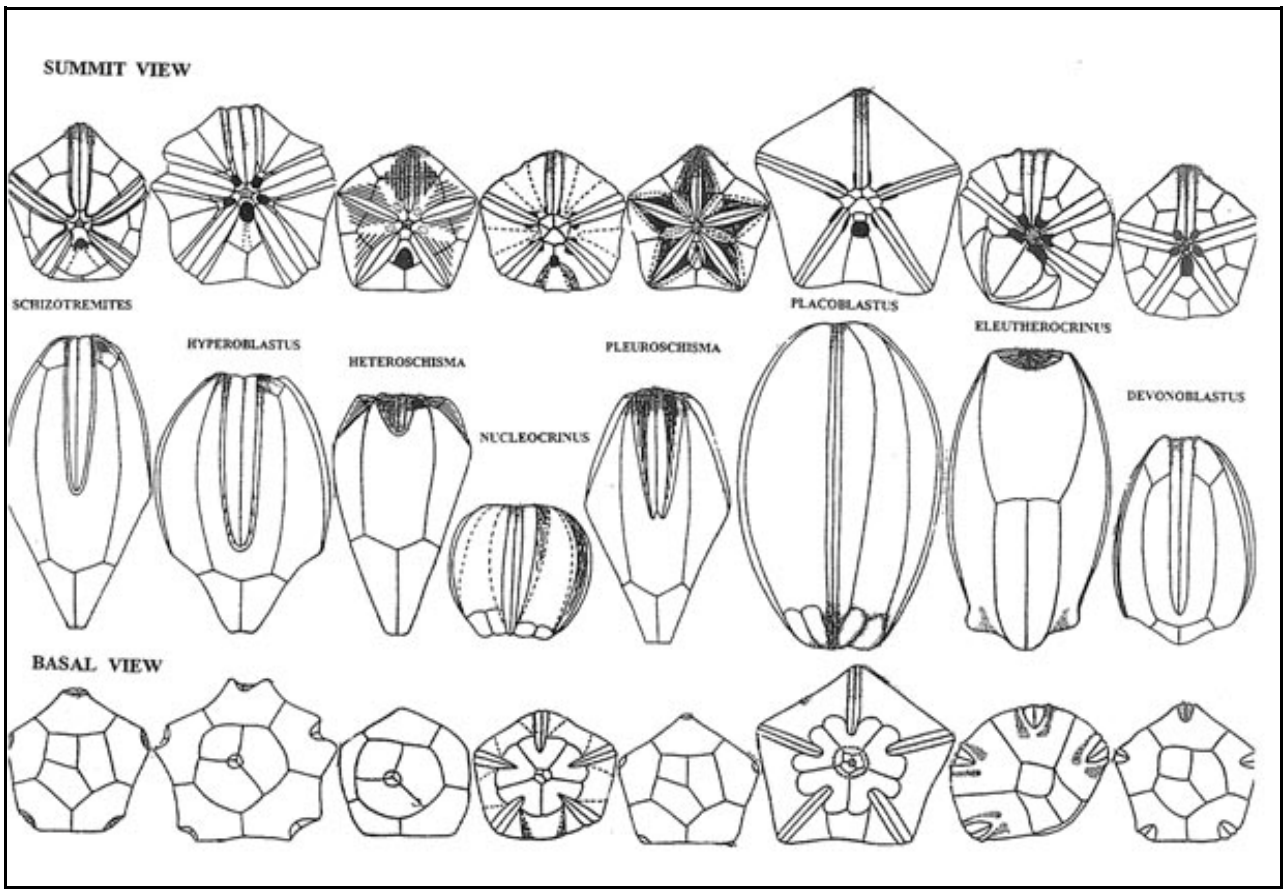


**Figure 6.**
**Devonian Blastoid Genera of the Michigan basin.**
**Plate structure of Devonian Blastoids which can be found somewhat locally.**

**These interlocking plates held the theca together once the animal died, which is in part responsible for their abundance as fossils. While not as diverse as crinoids, blastoid fossils are probably the most common fossil to be found in some Mississippian age rocks.**

**Despite the varieties in shape, all blastoids have a theca with five grooves radiating out from the mouth at the top center of the theca. As with edrioasteroids and crinoids, these grooves are the *ambulacra*. In life, each ambulacrum had long, thin structures called *brachioles* along their length. The brachioles were used to collect food (plankton) and move it towards the mouth. The brachioles were very fine and are not usually preserved in place, except in rare instances (Figure 7). Normally, one has to prep through a mess of disarticulated brachioles to end up with a decent looking blastoid.**

**Figure 7.**
***Hyperoblastus decipiens.***
**Devonian from the Arkona formation at Arkona, Ontario. Theca is 1.3 cm long. Rare example showing the stem still attached and the fragile brachioles.**

**The five holes at the top surround the mouth (Figure 8). The largest of these holes is the *anus*, while the rest are the entrances to a set of five complex respiratory organs called *hydrospires*.**

**Figure 8.**
**Top (oral) view of a *Pentremites godoni*, Mississippian age from Sulphur, Indiana**

**There are several species of blastoid to be found in the Devonian rocks of Ontario, as well as nearby New York and Michigan. Most are a centimeter or less, but specimens up to an inch long are not unheard of. There are no Ordovician forms here, but there is an incredibly rare animal called an Edrioblastoid (Figure 9). It is neither a blastoid nor an edrioasteroid, but is related to both. It is known from a handful of specimens from this area and recent discoveries in Australia, and nowhere else in the world. Because I don't do much hunting in the right strata, I don't know of any local Silurian examples. The Mississippian age sites where *Pentremites* are common are in and around**

**Figure 9.**
***Astrocystites ottawaensis.***
**Edrioblastoid from the Bobcaygeon formation at Brechin, Ontario. 3 cm wide. Someday…..someday…..**

**Tennessee, Kentucky, Iowa and Illinois. Examples from these sites can be found at most fossil/mineral shows. Some sites have also yielded examples with a preserved colour pattern –very rare in the fossil record. Permian examples are quite rare, with most coming from the island of Timor in SE Asia.**

**Photo credits:**
**Figures 5, 7, 9 - Friend's collection at http://crinus.info (used with permission).**

**Figure 6 - Unsure of original source, but this image taken from www.thefossilforum.com**
**A great website I am a member of (as Northern Sharks) along with several other KRFC members.**

**All others - Personal collection.**

# THE MINERAL CORNER
## Beryl
### Compiled by Sue Kehoe

**Nomenclature**

**Beryl has been known to ancient civilizations for thousands of years with a wide variety of names all generally referring to its blue-green colour. Initially terms referred to any stone of that colour, not necessarily all beryl. The name comes from the Greek "beryllos" meaning any blue green stone the colour of the sea. Pliny the Elder referred to emerald, aquamarine and beryl in his "Natural History" in 79 A.D.**

**Scientific research began in the late 1700's and early 1800's into rocks and minerals in more precise terms. Beryl was researched by Abbe Rene Just Hauy who believed that beryl and emerald were related and contained an as yet unknown element. He referred this problem to chemist Louis Nicolas Vauquelin (1763-1829), who was able to isolate beryllium oxide from those two minerals. Due to its sweet taste, he called it *glucinium* based on the Greek word for sweet, "glykys".**

**German chemist Martin Heinrich Klaproth (1743-1817) duplicated Vauquelin's research but changed the name to beryllium. Friedrich Wohler and Antoine Bussy isolated beryllium by creating a reaction between beryllium chloride and metallic potassium, leaving them with a minute amount of gray ash. In 1899 Marie Alfred (Paul) Lebeau isolated a very pure form of this metal using electrolysis of beryllium fluoride and sodium fluoride.**

**Figure 1.**
**Three varieties of Beryl:**
**Morganite (on left), Aquamarine (middle), Heliodor (on right).**

## Chemical Formula

**Beryl is beryllium aluminum cyclosilicate $Be_3Al_2(Si_6O_{18})$ . Cyclosilicates are a class of minerals composed of a six-sided ring of tetrahedra joined in a circle (Figure 2).**

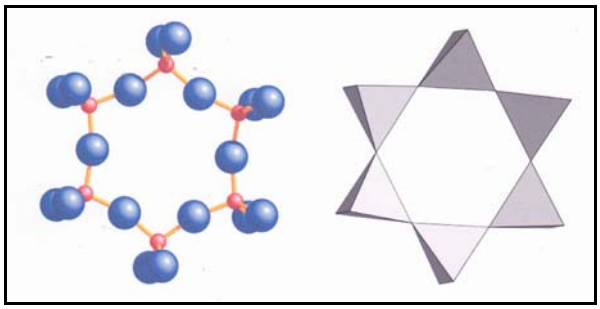

**Figure 2.**
**Atomic structure of Beryl.**

## Crystal Structure

**The silicate ($Si_6O_{18}$) rings stack on top of each other along the c-axis creating channels that run parallel to the c-axis. Crystals may be prismatic to tabular, varying from crystals to massive. Crystals are hexagonal, dihexadonal and dipyramidal in form (Figure 3).**

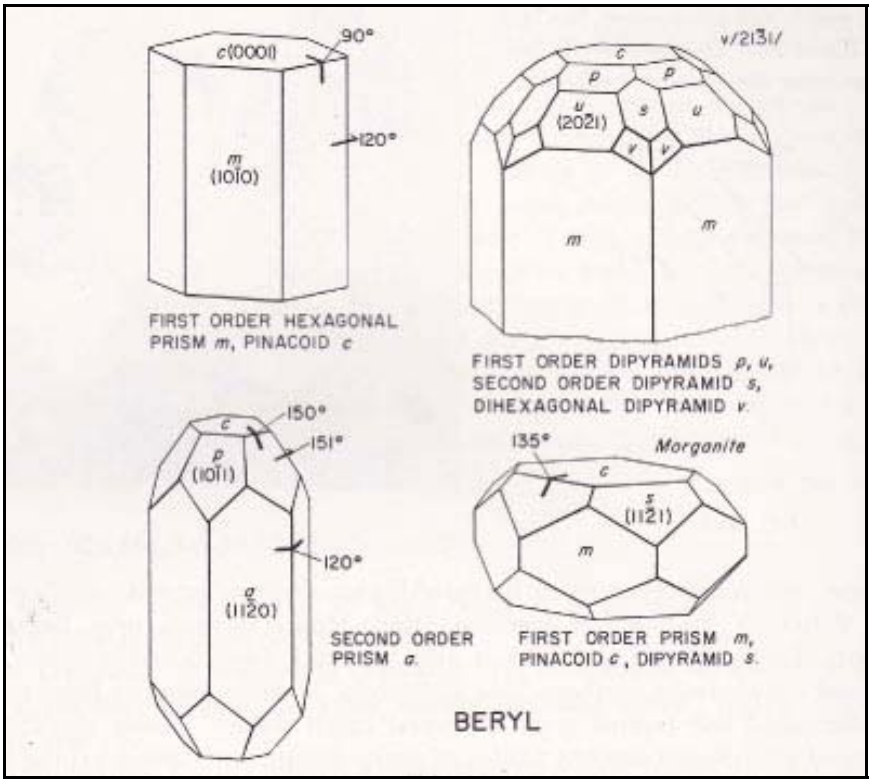


**Figure 3.**
**Crystalline structure of Beryl.**

**Beryl is a member of a group of related minerals with the following compositions. The general formula for this group is: R $X_3$ $Y_2$ $(T_6O_{18})$. $pH_2O$**

**Sites**

| Species | R | X | Y | $T_6O_{18}$ |
|---|---|---|---|---|
| Beryl | - | $Be_3$ | $Al_2$ | $Si_6O_{18}$ |
| Bazzite | - | $Be_3$ | $Sc_2$ | $Si_6O_{18}$ |
| Stoppanite | - | $Be_3$ | $Fe_2$ | $Si_6O_{18}$ |
| Pezzottaite | Cs | $Be_2Li$ | $Al_2$ | $Si_6O_{18}$ |
| Indialite | - | $(Al_2Si)Mg_2$ | | $(Al_2Si_4)O_{18}$ |

**Physical Characteristics**

**Colour:**

**Varieties of gem quality beryl have been named by their colours over a long period of time. These are aquamarine, heliodor, goshenite, morganite, cesian beryl, emerald and red beryl. The colours are due to minute quantities of other elements not significant enough to appear in the chemical formula. To a certain extent, colour is dependent upon where the element is found within the atomic structure. For example if $Fe^{3+}$ substitutes for the Aluminum in the octahedra structure, then the colour would be yellow (heliodor), but if it is found in the channel parallel to the c-axis, then the specimen is colourless and therefore could be goshenite. If $Fe^{2+}$ occurs in the channels, a blue colour is produced (aquamarine), whereas if it occurs in the octahedra it is colourless.**

**The use of heat and radiation on iron bearing beryl can also cause colour changes which may or may not be permanent.**

**Common beryl is pale yellow to green-blue depending upon the concentration of iron and the position in which it occurs within the beryl structure.**
**Green is due to $Fe^{2+}$ or $Fe^{3+}$**
**Blue is due to $Fe^{2+}$**
**Yellow/orange is due to $Fe^{3+}$**
**Pink is due to $Mn^{2+,}$ $Mn^{3+}$**
**Red Utah type is due to $Mn^{3+}$**
**Emerald green is due to $Cr^{3+}$ or $V^{3+}$**
**Colourless - no impurities**

**Aquamarine is the blue gemmy variety of beryl usually found in pegmatites.**
**Heliodor is the golden yellow beryl variety found in complex granite pegmatities.**
**Goshenite is colourless, and more alkali and is found in pegmatites.**
**Morganite is pink-orange beryl, more alkali, found in pegmatities.**

**Emerald is deep green and is found in hydrothermal veins in dark limestones or in proximity to a pegmatite. Red beryl (bixbite) is quite rare and is low alkali and is only found in topaz rhyolites.**

**Heating a yellow stone from 250° to 350° C. will reduce the $Fe^{3+}$ to $Fe^{2+}$ and render it colourless. Irradiating the colourless stone by exposing it to uraninite will restore the yellow colour. This may be the mechanism by which colour zoning appears in some crystals under natural conditions. Heating a pale blue aquamarine from 430° to 475° C. will enhance the colour to a deeper shade of blue.**

**Trapiche emeralds contain carbon based matter trapped during the crystallization process and may appear as a star on an emerald cabachon.**

| | |
|---|---|
| **Cleavage**: | **imperfect on {0001}** |
| **Fracture**: | **conchoidal to irregular** |
| **Tenacity**: | **brittle** |
| **Hardness**: | **7.5-8.0** |
| **Lustre**: | **vitreous to resinous** |
| **Streak**: | **white** |
| **Diaphaneity**: | **transparent to translucent** |
| **Specific Gravity**: | **2.76 (average)** |
| **Optical**: | **uniaxial (-)** |
| **Refractive Index**: | **1.57-1.58** |
| **Birifringence**: | **0.0040-0.0070** |
| **Pleochroism**: | **weak to distinct** |
| **Melting Point**: | **1287° C.** |
| **Magnetic**: | **no** |

**Insoluble in acids.**

**<u>Uses</u>**

**The ancient Greeks used it in its clear colourless form to make eye glasses. It was mined on the island of Elba by the Romans for the same purpose.**

**It has been used as jewellery or ornamentation for thousands of years. Emeralds from Cleopatra's mines in Egypt were regarded as a symbol of fertility and life. The Aztecs called emerald *quetzalitzli* (the colour of the feathers of the quetzal bird) and it was valued as a symbol of seasonal renewal. In Europe it was the stone of Hermes, the messenger of the gods and the being who escorted souls of the departed to their place in the afterlife.**

**Aquamarine amulets were worn by sailors to protect them from the dangers of the seas. They were often engraved with an impression of Poseidon, god of the sea. The Greeks believed that heliodor contained the warmth and power of the sun.**

**For those using crystals for healing purposes, beryl is claimed to counteract hyperactivity and bring about a calming effect on the mind. It was used as a healing**

**stone in Europe as a cure for stomach ailments and as a cure for dysentry, and even epilepsy. It was thought to be of assistance during child birth.**

**Beryl, chrysoberyl, bertrandite and phenakite are minerals that are sources of the element beryllium with beryl being the most important one. Beryllium does not exist alone in nature but always in combination with something else. Beryllium is dark gray, brittle, light weight and alkaline.**

**It is used to increase the hardness and resistance to corrosion in alloys of aluminum, cobalt, copper, iron and nickel. It is therefore very useful because of its rigidity, thermal stability and conductivity, and low density, allowing applications in satellites and space craft. It conducts heat well and is able to dissipate heat quickly.**

**It is transparent to xrays and is used in window materials in xray equipment, xray detectors, and in particle physics generators.**

**It was used in early fluorescent light fixtures, but it was replaced with halophosphates when it was discovered just how toxic beryllium dust could be. Beryllium metal is very toxic especially when inhaled causing damage to the lungs as berylliosis (similar to asbestosis). Many factory workers died or had permament disability from this before precautions were put in place, or beryllium replaced with safer minerals. Several scientists died, particularly when it was discovered that they were tasting it for its sweetness, to identify it.**

**As an alloy, a 2% mixture of beryllium in copper will increase the strength 6 fold. It makes excellent hand tools such as BeCopper wrenches, and is also used for the springs in surgical instruments from BeNickel. It is used in brakes in air craft for its hardness, and heat dissipation.**
**Since it is not magnetic it is safe in working tool to be used land mines for ordinance disposal.**

**Beryllium is also used as the mirrors in satellites such as the James Webb Space Telescope and the Spitzer Space Telescope. It contracts and deforms less than glass in extreme cold temperature conditions.**

**It has a few nuclear applications. In research where only a few neutrons may be required, $Be^{9}$ can be used in the laboratory rather than going to a heavy duty particle accelerator.**

**In electronics, it provides structural support and heat dissipation for printed circuit boards.**

**Beryllium oxide is used as an electrical insulator (heat conductor, high degree of hardness and strength, high melting point) on telecommunication radio transistors.**

**References**:

*Beryl and its colour varieties (Aquamarine, Heliodor, Morganite, Goshenite, Emerald and Red Beryl)*; Lapis International, LLC, East Hampton, Connecticut, USA, 2005.

*Healing Crystals and Gemstones, from Amethyst to Zircon*; Dr. Flora Peschek-Bohmer/Gisela Schreiber, Konecky & Konecky, Old Saybrook, Connecticut, USA, 2002, pages 96-97.

*Gems & Minerals, Earth Treasures from the ROM*; Dr. Kimberly Tait, Firefly Books, Buffalo, New York, 2011, pages 211, 216.
*Smithsonian Rock and Gem*; Ronald Louis Bonewitz, DK Publishing, New York, 2005, pages 290-291.
*Mineralogy for Amateurs*; John Sinkankas, Van Nostram Publishing, Princeton, New Jersey, 1964, pages 505-509.
www.en.wikipedia.org/Beryl and www.en.wikipedia.org/Beryllium
Figure 1. - www.en.wikipedia.org/Beryl
Figure 2. - www.en.wikipedia.org/Beryl.ring
Figure 3. - *Mineralogy for Amateurs*, John Sinkankas as above, page 506.

# THE SHOW CORNER

## 2013 Gem, Mineral and Fossil Show

**Yes Folks, the Show Chairperson, Don Doell, Jr. reported that the Show was a resounding success. The ticketed attendance was 1333 persons, but that number does not include the many children who were there.**

**Besides the many dealers offering their wares, the people attending were treated to some excellent displays covering mining, minerals and fossils which were put together by willing volunteers. The Canadian Gemmological Association was ably represented by Karen Fox who identified gems and minerals, offered jewlery cleaning and gave some advice on fake and real gems.**

**Don thanks everyone who volunteered in any way for the Show. This includes those who helped by distributing flyers and those who put up signs. By the way, if anyone still has signs, please return them at the next meeting so they can be stored.**

**Don recognizes and thanks those who helped in the set up and take down of the Show and those who assisted Fred Hall with the sandbox, both in donating samples and in physically helping to make the sandbox a fun event for the children. The much attended silent auctions and the live auction were made possible by donations, which Tom Jenkins put together for auctioning. Tom thanks all who assisted him at the auctions and all those who donated clean, clear milk bags. He asks everyone to keep on collecting them for him for next year's use. Thanks, also, to Mark Stanley for his excellent role as auctioneer at the live auction.**

**The Club table could not have functioned without the assistance of the many members who volunteered at least an hour of their time. Without the assistance of our members, the Show would not be possible. A big THANK YOU to everyone!!**

**The main door prize was a massive piece of Selenite from the Pernatty Lagoon, Mt. Gunson, Stuart Shelf area, Andamooka Ranges – Lake Torrens area, South Australia, Australia and was kindly donated by one of our members, Peter Szarka. This prize stimulated a lot of interest and was won by Rick Vandeven of Peterborough.**

**The Best Mineral Collected for 2012 prize was won by Ulrike Kullik. Her sample of a massive magnetite crystal 5½ inches wide, found in the old dumps at the Princess Sodalite Mine, is quite impressive (Figure 1).**

**Figure 1.**
**Magnetite**

**The Best Fossil Collected for 2012 prize was won by Kevin Kidd. His example of the rare trilobite *Ceraurus plattinensus* was found in the Bobcaygeon formation in Simcoe County, ON (Figure 2).**

**Figure 2.**
**Rare trilobite *Ceraurus plattinensus.***

**This is the second year in a row that these two participants have won their respective prizes. There were only two competitors for the mineral prize this year and only one competitor for the fossil prize. These winners need some competition so, come on everyone, get out there and collect and enter the competitions next year so we can see two different winners!**

**Photo credits**
**Figure 1 - Bev Fox**
**Figure 2 - Kevin Kidd**

## FIELD TRIPS - 2013

**From Ulrike Kullik, Field Trip Co-Ordinator**
**Ulrike.kullik@gmail.com**
**705 778 3787**

**First:**
**If you have mineral samples from the Silver Crater Mine, please bring them to the next club meeting so club members, who have not collected at the locality, know what to look for.**
**Second:**
**Don Doell Jr. will give us a presentation on how a Geiger counter works.**
**Could be handy at the Silver Crater Mine (Betafite).**
**Bring some HOT Rocks to test at the April meeting.**

| | |
|---|---|
| **April 20** | **Lakefield Speed Skating Track**<br>**Fossils – Kid friendly!!**<br>**Meet at the Peterborough zoo parking lot at 9:00 am, or at 9.30 am at the gate if you know the location.** |
| **May 4** | **Silver Crater Mine.**<br>**Meet at 9.00am at the intersection of Highway 28 and Highway 118 Paudash.**<br>**It is a long hike in and out.**<br>**Small parking fee.**<br>**Bring bug spray (just in case) and water.** |

**Minerals: Mica, Apatite, Betafite, Zircon, Calcite, Fluorite and more.**

**June 15 - 16** **Arkona Hungry Hollow**
**Fossils – Kid friendly!!**
**Will discuss how we meet there at the next Club meeting.**
**It is a 280-300 km drive from Peterborough.**
**If you want to stay overnight, best reserve a place to stay soon.**

**LET ME KNOW IF YOU PLAN TO GO ON A TRIP.**
**The sooner the better.**

**More Field Trips will be announced at a later date.**

## COMING EVENTS - 2013

**Apr 17** **Mineral Identification Night at the ROM 4:00 pm to 5:30 pm.**
**President's Choice Entrance on Queen's Park, doors nearest Museum subway stop. Visit their website at:**
**http://www.rom.on.ca/en/activities-programs/events-calendar/rock-gem-mineral-fossil-and-meteorite-identification-clinic**
**or contact at 416-586-5816; naturalhistory@rom.on.ca**

**Apr 19-21** **28th Annual Gem, Mineral and Fossil show of the Club de Mineralogie de Montreal**
**Friday - 3:00-9:00 pm, Saturday - 10:00 am-7:00 pm,**
**Sunday - 10:00 am-5:00 pm.**
**Center Pierre-Charbonneau 3000 Viau St. (Viau Metro), Montreal, Quebec.**
**Admission: $8, children 6-12 (accompanied), $4:00, under 6, free,**
**Parking $10.00.**
**Contact: 514-353-0101**
**Website: http://www.salonmineralxmtl.com/**

**Apr 27** **Haileybury Rock and Mineral Show**
**Saturday - 10:00 am-4:00 pm.**
**Haileybury School of Mines, 640 Latchford Street, Haileybury, ON.**
**Contact: 705-672-2740 or 705-672-3376 x8835 or hillierd@northern.on.ca**

**May 3-5** **Canadian Micro Mineral Association 50th Annual Symposium**
**Brock University, St. Catharines, Ontario.**
**Speakers: Dr. John A. Jaszczak and Dr. Steve Chamberlain**
**Contact: Bill Lechner at 416-438-8908 or bill.lechner@rogers.com**
*** Registration form available by request to the above. ***
**Website: http://www.canadianmicrominerals.ca**

**May 4** **The Kitchener-Waterloo Gem and Mineral Show**
**Location: Waterloo Community Arts Centre (aka the "button factory")**
**25 Regina St. S., Waterloo, 10 AM - 4 PM.**
**Rocks, minerals, gemstones, jewelry, fossils, meteorites.**
**Free admission. Free rocks for kids.**
**Contact: kwgemandmineralclub@hotmail.com**
**Website: www.calaverite.com/kwgmc**