



Voice of the Dinosaur

Newsletter of the
Kawartha Rock and Fossil Club

June 2012 ~ Volume 24 ~ Issue 6

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LAST MEETING

May 8, 2012

The meeting was chaired by the President, Mark Stanley and began with the regular business meeting. Minutes of the April meeting had been distributed to members earlier so were accepted without being read at the meeting.

Committee reports were given as applicable and approved.

Bob Moore kindly donated to the KRFC Library a hard cover copy of *The Physiography of Southern Ontario*.

Feature Presentation - Our speaker for the evening was Michael Bainbridge, who specializes in photographing mineral specimens for museums and private collections. Using some of his own photographs, he passed along many helpful tips for photographing minerals.

Tom Jenkins held one of his popular silent auctions.

NEXT MEETING

June 12, 2012

Place - Orientation Centre, Peterborough Zoo

Time - 7:00 pm.

Agenda - Regular June Meeting

Feature Presentation: Our President, Mark Stanley will speak on Lake Superior agates.

We will have another of Tom's popular silent auctions.

Mineral of the evening - agate and quartz.

Fossil of the evening - trilobites

NOTE: Tom Jenkins thanks everyone who has given him clean milk bags so far. Please keep on collecting, and cleaning them and give them to Tom when you can. They are much tougher than regular sandwich bags and are great for wrapping samples for the Kids Auctions, etc. With group participation, Tom should have a good supply by the 2013 Show.

THE FOSSIL CORNER

2012 Fossil Collecting - Trip 3

By Kevin Kidd

Saturday, April 14

I finally had the chance to go collecting with a friend of mine who's a trained paleontologist and trilobite expert. He knew of a new quarry that would likely be worth checking out and the best part is that it would be the Bobcaygeon formation we'd be looking in. For anyone familiar with Carden quarry, that was mostly Bobcaygeon formation and the fossils were predominantly echinoderms, with some trilobites. Complete crinoids (arms, calyx and stems) were fairly common, but Carden has been closed to collectors for the past several years.

We arrived at the quarry to find the front gate open. We put on our safety gear and drove in to search out whoever might be there. It turned out there was a maintenance crew doing some welding on the equipment. We asked if they'd mind if we poked around and they were fine with it –WOOHOO!!!! I only had one summer's worth of collecting at Carden and this was a great chance to add some goodies to my collection that can't be found at my regular collecting spot. The quarry is working in the lower part of the upper Bobcaygeon Formation and is still fairly shallow, which is great (Figure 1).



Figure 1.

Here you can see the contact between the upper and lower Bobcaygeon formation a few feet above the water. The upper is typically darker and made up of thin shale interbeds. The lower is lighter coloured, massive limestone, and very tough.

Fossils from the upper Bobcaygeon are likely to be found on small/medium pieces of rock. The lower Bobcaygeon rock is finer grained and much more solid. I walked around the perimeter of the pit seeing lots of partials eg. crinoid stems with no crowns, graptolite pieces, bryozoan shrapnel etc. Lots of bits, but nothing great. That changed in a big way in a few minutes. My first find of the day was a complete trilobite – *Ceraurus* (Gabriceraurus) cf. *plattinensis* (Figure 2).



Figure 2.

Here's the trilobite as found. To see the result after prepping, I think you'll need to come to the Club's show next spring.

That find alone made the trip worthwhile, but the day was still young and we were just getting started. I found a chunk of rock with several large branching bryozoans on it in the vicinity of the trilobite (Figure 3). As I usually find these a lot more fragmented, I decided to keep this piece as well.



Figure 3.

A bit further on, another trilobite. This one was also a species of *Ceraurus*, but the pygidium (tail) was missing (Figure 4, below).



Figure 4.
***Ceraurus* trilobite missing its tail.**



Figure 5.
Crinoid - *Reteocrinus*

My next find was what the Bobcaygeon is known for – a crinoid, and an uncommon one at that. This *Reteocrinus* was sitting on a pile, face up, just waiting to be found (Figure 5).

Around this time, I met up with my collecting partner who had started in the opposite direction to me and we compared finds. He had a slab with several *Cupulocrinus* crowns (crinoids), a piece with a couple of *Pleurocystites* cystoids and an extremely rare *Machaeridian* (believed to be an armoured worm).

Our next stop was the blast pile. Having been dry for so long, the pile was still very dusty, but that wasn't stopping us. Again there were a lot of crinoid stems, but few complete. We still came away with several *Isotomocrinus*, a fairly common small crinoid (Figure 6), and I also



Figure 6.
A crinoid - *Isotomocrinus*



Figure 7.
Cystoid - *Amecystis laevis* - Dorsal view

found a couple of cystoids –both *Amecystis laevis* and not nearly as common as the *Pleurocystites*. One of mine was an average size dorsal view (Figure 7, above) as is typically found, but the real treat was the second. It is the largest cystoid I've seen and is a ventral view showing all the tiny plates on what would have been the creature's underside (Figure 8, page 4).

Of course, this piece was in the middle of a huge slab of lower Bobcaygeon material. Even with a saw, it came out in 3 pieces and only after a lot of work with a small sledge and chisel. One thing about the Bobcaygeon stone; if there isn't a shaley seam in the rock, it is TOUGH stuff to extract anything from. With the effort it took to retrieve the cystoid, I was done. I waited while my partner did some cutting on his specimens, we thanked the crew who let us in and we were on our way. A follow-up phone call to the quarry revealed that they don't allow collectors, so in this case, timing was everything.



Figure 8.
Cystoid - *Amecystis laevis* - Ventral view

Saturday, April 28, 2012

Back to my regular spot with hopes that I'd do better than on previous trips here this year. I won't go into too many details, but I did have better success. There had still not been any new blasts, so again I'd be looking through old material to see what had eroded out and what others had missed. For the day I wound up with 3 prone *Flexicalymene* trilobites (Figure 9),



Figure 9.
Three *Flexicalymene* trilobites



Figure 10.
Enrolled *Isotelus* trilobite

none perfect, a decent enrolled *Isotelus* trilobite from the crush pile (Figure 10, above), a *Prasopora* bryozoan with a nice crinoid holdfast on it (Figure 11, below), and last but not least, a very unusual association –an edrioasteroid on a cephalopod (Figure 12, below).



Figure 11.
Bryozoan *Prasopora* with crinoid holdfast.



Figure 12.
An edrioasteroid on a cephalopod.

Unfortunately the edrio was incomplete, but this is the first time I'd ever seen this particular pairing. Edrioasteroids, to put it simply, are upside-down starfish on a base, and they are normally found either on a hardground surface or larger brachiopods. I'll write more about them next winter.

Until September – Happy Hunting!

THE MINERAL CORNER

Quartz

Compiled by Sue Kehoe

Nomenclature:

The origin of the word quartz is likely related to the word “quarz” meaning hard. The derivation is from Germanic miners' language of the middle ages, or possibly for the word “twarc” in Slavic. It appears in the writings of Georgius Agricola in 1530.

Chemical composition:

Silicon dioxide - SiO_2

Its chemical composition and the element silicon, Si were discovered by the Swedish chemist Jons Jakob Berzelius in 1823. Silicon dioxide is commonly called silica.

Class: Silicates

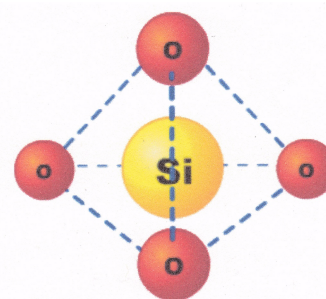


Figure 1.
Tetrahedral structure

Crystal structure, Form and Habit:

The chemical bonds in silica are covalent as they are based on atoms sharing electrons in their outer orbits. The basic building block of silica is the SiO_4 unit in which a central silicon atom is surrounded by four oxygen atoms (Figure 1, a tetrahedron). Oxygen is bivalent and the oxygen atoms in the corners of the tetrahedron are each linked to another silicon atom in a neighbouring tetrahedron. This three dimensional network of tetrahedras is quite rigid and does not readily allow the entry of other elements therefore quartz is a very stable compound that does not weather readily nor does it chemically react except with hydrofluoric acid. The tetrahedrons can join together in spirals resembling a helix. It can spiral right or left. Helices can form single chains or join together to form complex networks. See figure 2.

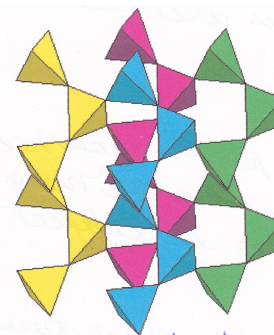


Figure 2.

Quartz forms six-sided prisms with six-sided pyramidal terminations. Horizontal striations are common. Occasionally crystals may contain inclusions of other crystals such as rutile, gas or fluids.

While the shape of quartz crystals can vary, the angles between the faces never changes, as shown in Figures 3 and 4.

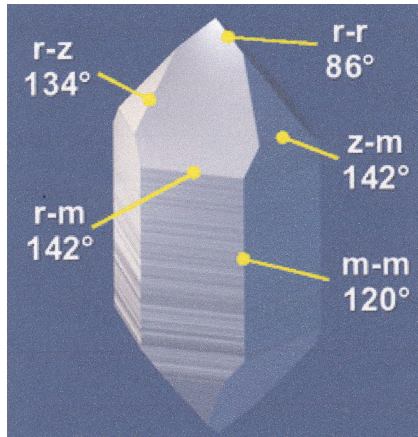


Figure 3.
Angles between faces.

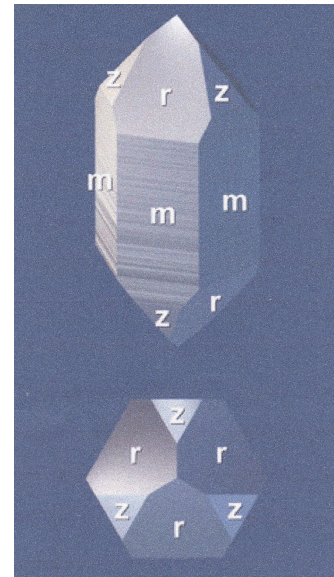


Figure 4.
Common quartz
crystal faces.

Quartz twinning occurs as common Dauphine law, Brazil law and some interpenetration twins and Japan law twins. Crystals occur usually in groups or clusters, in drusy fine-grained material and in aggregates of massive quartz with tiny granular texture.

Physical Characteristics:

Hardness:	Mohs scale 7.0. Will scratch window glass.
Cleavage:	None, or indistinct on {0110}
Specific Gravity:	2.65, 2.59-2.63 on impure varieties.
Luster:	Vitreous, to waxy or dull when massive.
Fracture:	Conchoidal
Tenacity:	Brittle
Melting Point:	1670° C.
Colour:	Clear and colourless, white (from accumulations of tiny gas bubbles in the quartz), smoky (light brown to black; black is called morion) and is due to radiation. Rose is due to traces of titanium, iron or manganese; Pink quartz is due to trace amounts of phosphate or aluminium; Milky is due to rutile or gas inclusions; Citrine yellow-brown is due to iron oxide (Fe ³⁺); purple is due to iron. See specifics under "The Quartz Family".
Streak:	White
Transparency:	Transparent to opaque
Refractive Index:	1.54-1.55
Birefringence:	+0.009 (B-G interval)
Pleochroism:	none
Fluorescence:	none
Solubility:	Insoluble at standard temperature and pressure.
Other:	Piezoelectric

Under mechanical pressure/stress an internal electrical charge will form in the crystal and the reverse will occur if an electrical field is applied to the crystal.

Uses:

In historic times quartz was used for making arrow and spear heads, and stone tools. In Babylon it was used for carved cylindrical seals and carvings. Drinking cups of carved amethyst were made in ancient Greece "to guard against drunkenness". Jewellery has been made all over the world from crystals of quartz, amethyst, citrine, jade, agate, tiger eye, etc. More modern uses include being a source of silicon compounds for microelectronics; for growing silicon wafers in the semiconductor industry, as industrial abrasives (sand); in foundry materials, ceramics, cements, phonograph pickups, glass, and frequency standards for radio waves. It is also used as quartz oscillators. Oscillators are pieces of quartz that have an electrical current applied to them. When the voltage is removed the crystal creates an internal electrical field and resonates at a constant frequency. This can then be used in clocks and watches or can be used as carrier waves for radio stations as the frequency is constant and precise. It is also used in computers, stun guns and metal detectors.

Occurrence:

Quartz is an essential component of granite and other felsic igneous rocks (20-60% content); sandstone, shale, most carbonate rocks, schist, gneiss, and quartzite. It forms deep in the earth's crust in cooling magma at temperature of 500 -1000 degrees C. It is found in hydrothermal veins and in pegmatites.

The Quartz Family:

Quartz shares its chemistry SiO_2 with a large number of minerals.

Macrocrystalline varieties: grow by adding molecules to the crystal's surface layer by layer. The R.I., S.G. and hardness are exact.

Rock crystal:	clear, colourless
Amethyst:	purple, transparent
Citrine:	yellow to reddish orange to brown, greenish yellow
Prasiolite:	mint green, transparent
Rose quartz:	pink, transparent
Rutilated quartz:	contains acicular needle-like inclusions of rutile
Milky quartz:	white, translucent to opaque
Smoke quartz:	brown to gray, opaque
Phantom quartz:	contains accumulations of gas bubbles or other material in the termination points enclosed in the crystal as it continues to grow (green from chlorite, reddish brown from iron, blue from riebeckite, white for gas, liquid or etching).
Pink quartz:	pink, transparent

Microcrystalline varieties: form from a colloidal watery solution of silica. R.I., S.G. and hardness are approximations. Their final structure varies with environmental conditions and the amount of impurities embedded during formation.

Chalcedony:	cryptocrystalline quartz and polymorph moganite mixture, white or lightly coloured.
Agate:	multicoloured, banded chalcedony, semi-translucent to

	translucent; banding follows the outline of cavity within rock.
Onyx:	agate with bands of alternating black and white
Jasper:	opaque cryptocrystalline quartz, typically red to brown from hematite; clay is yellowish-white or gray; goethite produces brown or yellow jasper.
Aventurine:	translucent chalcedony with small inclusions from green fuchsite mica or brown from pyrite, red brown from hematite, but always massive and granular.
Tiger's Eye:	fibrous gold to red-brown coloured quartz, due to parallel veins of crocidolite (blue asbestos altered to iron oxide then replaced by silica) exhibiting chatoyancy.
Carnelian:	reddish orange chalcedony; colour from iron oxide, translucent.
Cat's Eye:	greenish-gray parallel fibres of asbestos and reddish-golden fibres of rutile, chatoyancy possible if skilfully cut in cabochon
Hawk's Eye:	similar to tiger eye but crocidolite is replaced by quartz without altering to iron oxide, retaining the original blue colour.
Heliotrope:	dark green variety of chalcedony; colour due to iron silicates, with inclusions of bright red jasper.
Sard:	translucent light to dark brown chalcedony; colour from iron; bands of sard and white chalcedony are called sardonyx.
Chrysoprase:	translucent apple green variety of chalcedony; colour from nickel.
Grainy Varieties:	Chert, flint

Growth forms:

These are forms of quartz that vary by how the crystal grows, where secondary growth occurs and develop in different ways. Examples of this are Artichoke quartz, Bent quartz, Cactus Quartz, Cathedral Quartz, Elestial Quartz, Faden Quartz, Phantom Quartz, Sceptre Quartz and many other varieties.

References:

Figure 1. - www.wikipedia.org

Figure 2. - www.uwgb.edu

Figures 3 & 4. - www.quartzpage.de

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Handbook of Rocks, Minerals & Gemstones; Schumann, Walter, Houghton, Mifflin, New York, 1993

KRFC FIELD TRIP CORNER

Field Trip to Bear Lake Dig by Bev Fox

Sunday, May 6, 2012

An enthusiastic group of Club members gathered together in preparation for entering the Bear Lake Diggings (Figure 1). This pay per dig site, managed by the Bancroft District Chamber of Commerce, has long been known as an excellent site for collecting minerals such as titanite, apatite, feldspar, amphibole, biotite mica and many others.



Figure 1.

For more info on the site go to www.bancroftdistrict.com. There is also an excellent overview video on You Tube: <http://www.youtube.com/watch?v=DeowppqyaA4>
Figures 2 and 3 below are examples of the terrain and surrounding area.



Figure 2.



Figure 3 .

The Diggings are a great place for families as children are allowed in and many minerals are found close to the surface or free from the surrounding rock on the surface. "Cutting the gneissic bedrock... are calcite filled vein dykes. The walls of these veins are lined with large crystals of biotite,... hornblendes and feldspar, while the cores are composed of coarse grained calcite, and large crystals of apatite, titanite, biotite and hornblende."¹ In many cases, the calcite was gradually eroded away by the acidic water which formed from surface water leaching through leaf litter, freeing the other minerals. Black earth filled in the veins so by digging into the dirt filled veins, the loose minerals can be found. However, many of the minerals are still encased in the calcite.

Green apatite crystals are one of the minerals often found in this area but finding a whole crystal is difficult. Even the larger crystals when found *en situ* tend to have fractures and, if found whole, are difficult to extract in one piece. Figure 4 (below) shows some crystals still embedded in calcite and already showing some fracturing.



Figure 4.



Figure 5.

Figure 5 shows my “Bear Lake conglomerate”, a combination of some biotite mica, a few reddish apatite crystals and some hornblende on calcite.

This is a great site for a family. Take a lunch, go in and dig and have fun!

Reference:

1. The Bear Lake Diggings pamphlet, Bancroft and District Chamber of Commerce.

Photo Credits:

Figures 1-4 Sue Cheesebrough

Figure 5 Bev Fox

KRFC FIELD TRIPS

If you are interested in attending field trips through the summer, make sure you stay in contact with Ulie. She has given the info for the field trip listed below, but there may be more trips after this issue of the *Voice*. If you are interested in any trip, or if you need more information, please contact her:

Email: ulrike.kullik@gmail.com

Phone: 705-778-3787

If you have suggestions for field trips, let her know.

June 10 Princess Sodalite Quarry

Meet - 10 am at the Quarry Shop.

Children are welcome!

\$10.00 to collect in the old dumps. This includes 10 pounds of material, additional material is \$1.50 a pound.

Last year we found some nice size Magnetite and some Sodalite.

To go in the Rock Farm you have to pay extra.

THE EDITOR'S CORNER

Since the Newsletter is not published during the summer, this is the last issue of the *Voice* until September. My thanks to Kevin Kidd for his consistently excellent articles on fossils and fossil hunting. I know the members look forward to each issue to see what Kevin's next article might be. Thanks are due, also, to Sue Kehoe. She took on the responsibility of writing an article on minerals for each issue and is doing an excellent job. She had no prior experience, but felt that she would like to take on this challenge to help her to learn more about minerals. My thanks to Sue Cheesebrough for furnishing photos taken at the KRFC trip to the Bear Lake Diggings. They help to enliven my rather dreary prose.

If any member feels the urge to write an article for the *Voice* related to geology, rockhounding, old mining towns, etc., please do so. Many of you have had work experience related to geology, prospecting, etc. and I'm here to help you put your ideas into print, even if you do not believe you are a writer.

Our KRFC Website is attracting more and more attention. Bob Moore is doing an excellent job designing and maintaining the site. Several members have their own "picture galleries" on the site which are added to regularly. As well there are photos from field trips, the 2011 Show, and a Scapolite Gallery. Bob has made sure to include info pertaining to the Club, a downloadable membership form, links to other clubs, and a list of Coming Events among other things. If you have not had a look lately, please do so. We have some very talented members!

COMING EVENTS - 2012

- Jun 9 NPGS 2012 Gem, Mineral, and Fossil Show and Sale - a GEO VENTURE!
Saturday, June 9th - 10 am until 5 pm
Mountainview United Church, 150 Glendale Avenue, St Catharines - in the heart of the Niagara Region.
Vendors of minerals, crystals, gems, opals, pearls, fluorescents, fossils from both Canada and from around the world and hand-crafted, one-of-a-kind jewellery and art.
Rock splitting, flint-knapping, and lapidary demonstrations - plus treasured displays of members' collections - including the NPGS Touch Table (where you can actually pick up and examine rocks from Niagara, the Grenville Province, and volcanoes).
NPGS members will be available for rock identification and to talk about rockhounding.
Admission - a donation at the door - proceeds go towards a Brock University Earth Sciences student scholarship.
Free Parking
Coffee, tea, water, and snacks will be available throughout the day - and a chance to win a mega door prize.
Directions: Take the QEW to Highway 406 to the Glendale exit - turn left onto Glendale going past the Pen Centre. Mountainview Church is at the corner of Valerie Drive and Glendale Avenue - halfway between the Pen Centre and Glenridge Avenue.
Website: <http://www.ccfms.ca/clubs/NPGS/index.htm>
Show and Sale Webpage: <http://www.ccfms.ca/clubs/NPGS/show.htm> for more details and a map.
- Jul 15 Prince Edward County Rock, Gem & Mineral Show
Rekindle the rockhound in you and discover nature's treasures at our first event - showcasing gem and mineral, lapidary and jewellery exhibitors in the historic Crystal Palace
PEC Fairgrounds - Crystal Palace, 375 Main Street, Picton, ON.
10am to 5 pm
Admission: \$3.00, Children 12 and under free.
Contact: 613-476-5510
www.facebook.com/home.php#!/home.php?sk=group_180988188614305
- Jul 18 Mineral Identification Night at the ROM

4:00 pm to 5:30 pm

Use President's Choice Entrance on Queen's Park, doors nearest Museum subway stop.

Website: www.rom.on.ca/programs/id_clinics.php

- Jul 20-22 30th Annual Sudbury Gem and Mineral Show
"Northern Ontario's Largest Gem, Mineral, Fossil, Bead and Rock Craft Show and Sale"
Fri. 5 pm-9pm, Sat. 10 am-6pm, Sun. 10 am-5pm.
Location : Carmichael Arena, 1298 Bancroft Drive across from Minnow Lake; 1 km. south of the Kingsway (Hwy. 17 East).
Admission: Adults \$5, Seniors \$3, Kids 6-12 \$1, Kids under 5 free with adult.
Features: Dealers; displays; demonstrations; door prizes (including amethyst geode grand door prize); silent auctions; kid's activities; mineral identification; video theatre; field trip Sun. at noon; BBQ; free handouts and literature; outside dealers/swap area Sat. 11:00 am-4:00 pm; prospectors and metal detecting displays; free parking.
Contact: Ed Debicki - (705) 522-5140, E-mail: ed.debicki@sympatico.ca
Website: <http://www.ccfms.ca/clubs/Sudbury/show.htm>
- Jul 29 Bancroft Gem & Mineral Club 16th Annual Gem & Mineral Show
Sunday 10 am-4pm.
Bancroft Legion Hall, Station St., Bancroft, ON
Features: 25 dealers plus silent and live auctions
Admission: \$2/adult, children & students (18 yrs & under) free.
Contact: Frank Melanson at 613-332-1032.
- Aug 2-5 49th Annual Rockhound Gemboree - "Canada's largest gem & mineral show"
North Hastings Community Centre 103 Newkirk Blvd, Bancroft, Ontario and the Bancroft Curling Club at 63 Newkirk Blvd.
Thursday, Friday and Saturday from 10 a.m. until 7 p.m. and Sunday from 10 a.m. until 5 p.m.
Admission: Students & Seniors \$7, Adults \$8 and children under 6 are free.
Features: Over 100 dealers with gems, minerals, tools, gemstone jewellery, free mineral identification, field trips, activities like gold-panning, rock wall climbing and demonstrations of lapidary arts. Demonstrations of healing with gemstones, reclaiming gemstones, and dowsing.
Special guest speakers, including Bob O'Donnell "The Fossil Guy". Fun for everyone!
For more information, contact the Bancroft & District Chamber of Commerce , Tourism & Information Centre in Bancroft. 1-888-443-9999 Website: www.bancroftdistrict.com
- Aug18 Rockhound Family Day at Robert Hall Originals. A fun family event!
Saturday, August 18, 10 am-4pm Admission: Free
138 Sugar Maple Road, St. George Ontario
Features: Kids Fossil Dig, Rock BuddyCraft For kids – Free Mineral Identification. Bring A Specimen! Explore Outdoor Rock Piles!
Giant Silent Auction - Bring your items to include in the auction! Bidding begins at 11:00 am & 1:00 pm. *10%commission)
Free Rock Swap – Bring a table and set up you treasures. Contact us to reserve your free rock swap space.
Contact: inquiry@roberthalloriginals.com Phone: (519) 448-1236 or 1-800-360-2813
Website: <http://www.roberthalloriginals.com>