Voice of the Dinosaur

Newsletter of the
Kawartha Rock and Fossil Club

November 2012 ~ Volume 24 ~ Issue 9

CLUB ADDRESS:
1211 Kenneth Ave.
Peterborough, ON
K9J 5P8

PRESIDENT
Mark Stanley
705-639-2406
mark.stanley@bellnet.ca

VICE-PRESIDENT
Steve Wesley
705-743-9175
swesley@i-zoom.net

TREASURER (to Jan. 2012)
Ken Fox
705-742-6440
kfox 71@cogeco.ca

SECRETARY
Open

FIELD TRIP CO-ORDINATORS
Ulrik Kullik
705-778-3787
ulrik.kullik@gmail.com
Bill Rawson
wrawson62@live.com

SHOW CO-ORDINATOR
Bob Beckett
705-748-0178
rbeckett@cogeco.ca

NEWSLETTER EDITOR
Bev Fox
705-742-6440
kfox71@cogeco.ca

PAST PRESIDENT
Bob Beckett

WEB SITE:
www.rockandfossil.com
WEBMASTER: Bob Moore
bobmoore@hotmail.com

Member of the CCFMS

LAST MEETING
October 9, 2012

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

Committee reports were given as applicable and approved.

The members decided a review of the Constitution and Bylaws were not necessary at this time.

Once again Tom Jenkins held one of his very popular silent auctions.

NEXT MEETING
November 13, 2012

Place - Orientation Centre, Peterborough Zoo
Time - 7:00 pm.
Agenda - Regular November Meeting
Feature Presentation: Fossil Preparation by Kevin Kidd
Please bring along some fossils you have found this summer.

Tom will hold a silent auction.

Message from the President:

Our year will be coming to a close in a few months. It is time to start thinking about running for an Executive position. The positions of President, Vice President, Secretary, Treasurer, Field Trip Coordinator and Show Chairperson will all be up for election at our Annual General Meeting. While some of the current members who are serving the club in an Executive position, may choose to stand for re-election, all positions are open to any member who is willing to run. Please give consideration to how you can serve our club. It is something that I have greatly enjoyed.

Sincerely,
Mark Stanley
President

THE FOSSIL CORNER
2012 Fossil Collecting - Trip 6
By Kevin Kidd

Sunday, September 30

Once again it was time for the annual pilgrimage to the St. Mary's Cement quarry in Bowmanville. Considering that this is a very limited access site and the amount of things that get found every year, I'm surprised more people don't go, but I guess that makes it better for those of us who do. After the prerequisite safety talk from the quarry manager, the 16 or so attendees were led in and all the way down to the newly dug 5th level (Figure1). It was flooded, but there was a berm of limestone pieces all around the water. I lasted maybe 5 minutes down there. I hadn't had any previous luck on level 4 and there was a huge blast pile on level 3 that I was dying to get to (Figures 2 & 3).

Figure 1.
Looking down at the group on Level 5 from a distance.

Figure 2.
The blast pile. Trilobite Hunting Heaven.

Figure 3.
Overview of the Quarry looking West.
Photo courtesy of Peter Lee.

Level 3, typically our starting point in past trips, is likely the most trilobite infested level of the quarry nowadays. The very top level, the Whitby shale, used to produce plenty of *Pseudogygites latimarginatus* trilobites (Figure 4, page 3), but now that it isn't worked, they are few and far between. I started climbing the blast pile and there were pieces of trilobite everywhere, including some pieces from what would have been true behemoths. I think the largest fragment I saw was a tail that had to be 5 ½-6" wide, making the trilobite that lost it well over a foot long (Figure 5, page 3).

I had the pile to myself for about 15 - 20 minutes, but wasn't finding anything other than partials. That was when the caravan of collectors all made their way up from the bottom and hit the pile with me. It wasn't long after that when I heard the first rock

Figure 4.
***Pseudogygites latimarginatus* from my collection and from this site, but not found this trip.**

Figure 5.
Pieces of larger trilobites were found, and although in rough shape, this was likely the most intact large "turtle" found on the trip. Found by M. Martin. Penny for size reference.

saw get fired up. I couldn't keep track of everyone's finds, but I think most of us wound up with a trilobite or at least a large part of one.

As a cloud of dust formed around that saw, I found my first "bug" of the day. The most common species at the site is *Isotelus mafritzae*, and this is what I now had in my hands (Figures 6, 7, 8). The head is slightly disarticulated and off to the side, but it has both eyes, which is uncommon. The eyes stick up off the head and if exposed, they are likely to be sheared off.

Figure 6.
***Isotelus mafritzae* as found.**

Figure 7.
***Same Isotelus* after prepping.**

Figure 8.
Same *Isotelus* after prepping.

With lots of cutting and hammering going on around me, I continued climbing the piles. What I found next was a bit disappointing; on a large rock was a negative impression of would have been a beautiful crinoid, with stem, calyx and arms splayed out. I looked, but couldn't find the positive part. Crinoid stems are common here, but usually that's all you'll find-stems. Calyxes, the crinoid's "body", are much less likely to be found and I'd like to be adding one to my collection. In my search for the crinoid positive, I saw another negative, this time it was a nice big prone *Flexicalymene croneisi* trilobite, a different species than what I normally find. Sure I had one trilobite so far, but these negatives were starting to depress me. That changed when I found an enrolled trilobite on a large rock (Figure 9). I was thinking it was a *Ceraurus*, but have been told that it may be *Flexicalymene*. Either way, I'm happy, and this find seemed to open the floodgates.

Figure 9.
Enrolled trilobite.

I next found part of another *Isotelus* trilobite sticking out of the edge of a rock. I have doubts whether or not it was complete as it seemed to stop rather than continuing into the rock, and since it shattered when I was trying to extract it, I'll just assume it was a partial. Not far from there was another good prone example, albeit without eyes (Figure 10).

Figure 10.
Prone trilobite missing eyes.

More climbing and a lot more partials and heartbreakers later, I found my last more or less complete one, again without eyes (Figures 11 & 12).

Figure 11.
***Isotelus mafritzae* as found.**

Figure 12.
Same *Isotelus*, after prepping –more about that at the November meeting.

I had marked all of my finds and now it was time to go to the car and get my saw. Along the way, I happened to look down at the base of the pile and spotted a slab with a pair of negative *Isotelus* impressions. This one I kept, just because there were two so close together (Figure 13).

Figure 13.
Two negative *Isotelus* impressions.

I made my cuts, and let me say, climbing with a saw, hammer, chisel and specimens gets quite exhausting, quite quickly, but I wasn't about to leave early. There were still a couple of hours left before we had to clear out, so I joined the others on level 2.

Not as much here to be found, but I was seeing my first pieces of *Pseudogygites*, which get more and more common as you go up. Keeping a close eye on time, I managed to find my first Bowmanville crinoid(s?). No pic yet as it needs to be prepped to look halfway decent. This last find was the icing on the cake-pun intended as this also happened to be my birthday. I met up with the others and after a bit of show and tell in the parking lot, a group of us went to Wendy's for dinner. As my wife said, the quarry gods were smiling on me that day, and it was a birthday I won't soon forget.

Until next month – Happy Hunting!

Photos by Kevin Kidd unless otherwise noted.

THE MINERAL CORNER
Apatite
Compiled by Sue Kehoe

Figure 1.
Apatite crystal

Nomenclature:
Apatite was named around 1788 from the Greek word "apatao" or "apate" meaning to deceive, as it is similar to several other minerals such as beryl, tourmaline, quartz, and calcite.

Chemical Formula

The general chemical formula for apatite is:

$Ca_5(PO_4)_3(OH,F,Cl)$ - calcium triphosphate

Apatite represents a family of minerals with very similar chemical signatures such as:

- **fluorapatite or Apatite CaF, $Ca_5(PO_4)_3F$**
- **hydroxylapatite or Apatite CaOH $Ca_5(PO_4)_3(OH)$**
- **chlorapatite or Apatite CaCl, $Ca_5(PO_4)_3Cl$**
- **carbonate-rich apatite /francholite $Ca_5(PO_4,CO_3)_3(F,O)$**
- **bromapatite or Apatite CaBr $Ca_{10}(PO_4)_6(Br)_2$**
- **collophane: a white botyroidal microcrystalline form found in phosporite**
- **manganapatite: a manganese rich apatite**
- **sammite or Apatite CaSr: strontium rich apatite**
- **staffelite: another botryoidal form of apatite**

Crystallography

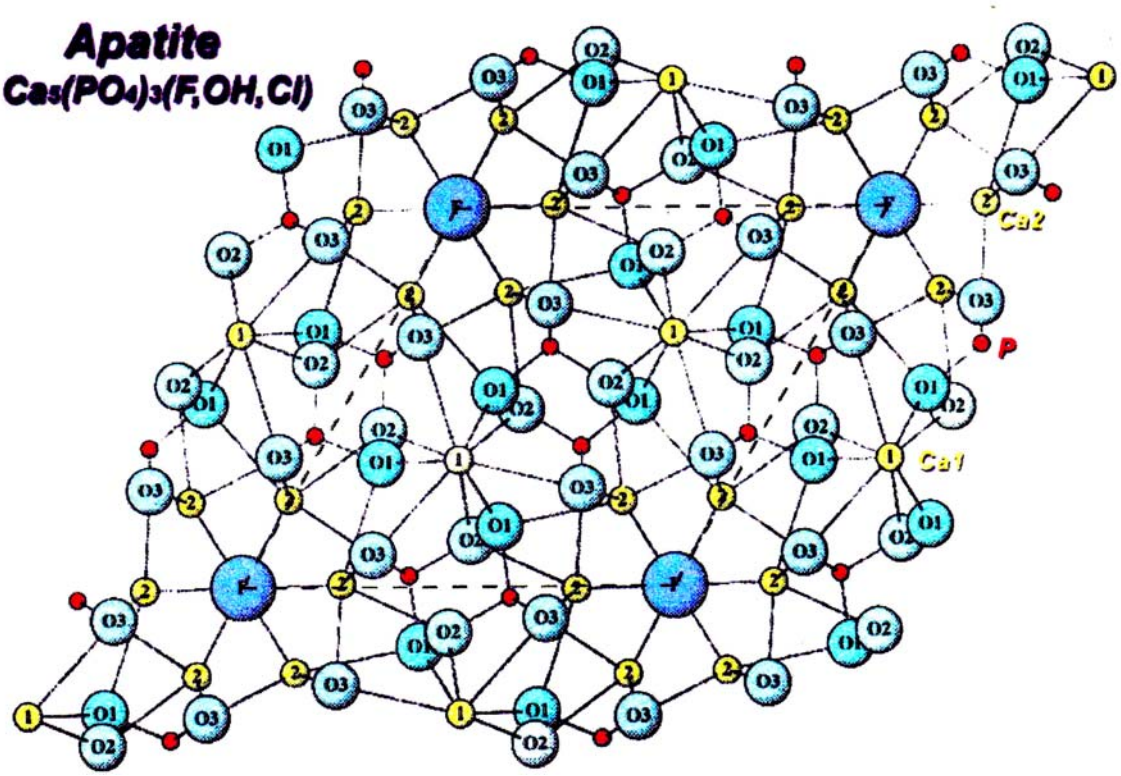

Figure 2.
Apatite atomic structure diagram.

A chain of phosphate tetrahedra join to two calcium polyhedra coiling around a central channel such that the 1st tetrahedra positions above the 3rd and the 2nd positions above the 4th. This creates hexagonal dipyramidal crystals.

The calcium component can substitute with any or part of sodium, strontium, barium, magnesium, lead, manganese, iron, europium, yttrium and other 2+ ions.

The phosphate component can substitute with sulphate, carbonate, and silicon.

Physical Characteristics

Crystal Habit:	**Apatite can be tabular, prismatic, massive, compact, granular, or botyroidal (as in collophane).**
Colour:	**Green, yellow, brown, blue to violet, pink, and less often white or colourless**
Cleavage:	**{0001} indistinct, {1010} indistinct, usually 1 direction crosswise**
Hardness:	**5 on Moh's Scale and is the defining mineral for this hardness**
Lustre:	**vitreous to subresinous**
Streak:	**white**
Diaphaneity:	**transparent to translucent**
Specific Gravity:	**3.16 - 3.22**
Optical properties:	**double refractive, uniaxial negative**
Refractive Index:	**1.634 - 1.638**
Birifringence:	**0.002 - 0.008**
Pleochroism:	**Blue stones - strong, blue and yellow to colourless; other colours - weak to very weak**
Fluorescence under U/V light:	**Yellow stones - purplish-pink stronger in long wave Blue stones - blue to light blue in long and short wave Green stones - greenish yellow, stronger in long wave Violet stones - greenish yellow in long wave, and light purple in short wave**

Occurrence

Apatite is found in igneous, metamorphic and sedimentary rocks world-wide. It is associated with quartz, calcite, feldspar, muscovite, magnetite, phlogopite and nepheline.

Fluroapatite is the most common form. It is more acid resistant than hydroxyapatite. Fluoridated water allows fluoride ions onto the surface of tooth enamel, substituting for the hydroxyl component of apatite. Too much fluoride can cause both dental and skeletal fluorosis disease.

It is also the preserved mineral in fossilized teeth and bones where fluoride in the soil and sediments substitutes for the original biological bone and tooth apatite.

Hydroxyapatite is a major component of tooth enamel and bone. There is a difference between rock mineral hydroxyapatite and biological apatite as the OH component has been substituted with carbonates and acid phosphates creating much smaller particle size in bone mineral than in geological specimens. Some progress is being made in producing a synthetic apatite for use as a dental or bone cement and the possibility in the future of artificially created bone.

The exact chemical composition of bone has proven to be elusive for researchers even with the availability of spectroscopy and x-ray diffraction as it varies from the birth of an animal to its maturity. Various substitutions of ions and vacancies also tend to break the lattice structure in bone matrix when compared to geological specimens. There is also a difference between marine invertebrates and land animals

in that there tends to be calcium carbonate, not calcium phosphate, in the shells and bones from the seawater environment.

Uses

Apatite is an essential mineral for all life on earth and a major component of the phosphorus cycle that begins with the release of phosphorus from the breakdown of apatite, and its uptake by plants and animals. It is a major source of phosphorus in the manufacture of phosphate fertilizer, phosphorus for matches, detergents, phosphoric acid, rust removers, motor fuels and insecticides.

Fission tracks in apatite can be used in thermal dating (Uranium-Thorium) the age of mountainous areas and the sediments in sedimentary basins. Moon rocks gathered during the Apollo mission contained trapped water in apatite indicating the presence of lunar water at some point in the moon's history.

Apatite can be used for creating gem-faceted stones but tends to be very brittle and not hard wearing. Gem quality specimens are most often found in pegmatites. Cat's eye apatite is the result of rutile in apatite creating a fibrous apatite giving the chatoyant effect for cabachons. These have been found in Brazil and Sri Lanka.

References

www.geology.com
www.minerals.net
www.webminal.com
www.MinDat.org
Figure 1 - from my own collection
Figure 2 - www.geol.lsu.edu
***National Audubon Society Field Guide to North American Rocks and Minerals*, pp.482-483, Charles W. Chesterman, Alfred A Knopf, New York, 1979**
***Smithsonian Rock and Gem*, p.195, Roandl Louis Bonewitz, DK Publishing, New York, 2005**
"Bone mineral: update on chemical composition and structure", C. Rey, C. Combes, C. Drouet and M. J. Gimcher; *Osteopros Int.*, 2009 June; 20(6):1013-1021.
"The crystal structure of Apatite, Ca5(PO4)3 (F,OH,Cl)", John M. Hughes and John Rakovan, *Reviews in Mineralogy and Geochemistry 2002*, v.48, no. 1 p.1-12, extract www.rimg.geoscienceworld.org

THE LIBRARY CORNER

The Club has an extensive selection of books on minerals, fossils, geography, geology and many other relevant subjects. We also have some videos, though not many of you may have the equipment to show them anymore, and an excellent set of DVD's on geology.

Unfortunately, not many members borrow items from the Library. The last list of library holdings was sent out in April, 2011. If you have misplaced your list and would like a new one, just email me at: kfox71@cogeco.ca and I will email one to you. It would be a pity to have to sell off the Library holdings because members are not interested enough to use them.

This is also a good time to mention that the Club has an excellent stereo microscope with a fiber optic light and adapter for a camera and a black light that is available for members to borrow.

Bev Fox, KRFC Librarian

THE EDITOR'S CORNER

Thanks to Sue Kehoe and Kevin Kidd for their always interesting articles which ,also, help to educate. They are two Club members who stepped forward and offered to write for the Newsletter on a regular basis. Sue Kehoe has found that writing a monthly column on minerals is a great learning experience, strengthening her knowledge of minerals.

I encourage any member, who might want to write an article of interest to our rockhounding members, to do so. Or, if anyone would like to see an article on a particular subject, let me know. There are so many topics that might be of interest including geology, glaciation, history of mines, old mining towns, interviews with people who prospected or were miners, etc.

Thanks must also be given to our Webmaster, Bob Moore who maintains the website, which is the Club's "face" to the world. He is doing an excellent job and always welcomes photos from Club members. You can contact him at: bobmoore@hotmail.com

Our President, Mark Stanley has reminded us that elections will be held at the Annual General Meeting in January. It is very important that members who have not held office, step forward and take positions on the Executive. New people with fresh outlooks are needed to revitalize the Club. But, perhaps the thought of being President, Vice-President, Treasurer, Secretary, Field Trip Co-Ordinator or Show Chairperson is not appealing, then consider easing in to the position of Recording Secretary (taking minutes of each meeting), Newsletter Editor (I've found this most rewarding), Librarian (you have the holdings of the Club Library at your disposal) or Archivist. To hold any Club position you must be a paid-up member at the time of the AGM so be sure to renew your membership beforehand. The 2013 renewal form will soon be on the Club's website for downloading, a copy of the form will be sent in the December and January Newsletters and some forms will be available at meetings.

It's not too soon to remind everyone that our annual Club Show will be held in early March. The Show Chairperson will soon be asking for volunteers for setup and takedown, for sign placement and distributing flyers, for helpers to assist with the Kids Dig sandbox, auctions and the Club table. If you are not able to attend the meeting, this is a good way to become involved and meet more members as well as have some fun.

Don't forget, the prize for the best fossil and mineral collected in 2012 is awarded at the Show and all members are eligible to enter. Any member who is interested can also put together a display that relates to fossils and minerals, mining, etc. The Club has display cases so consider a display on your own or sharing a case with another member. The displays are always a big attraction for people who come to the Shows.

NOTE: Tom Jenkins thanks everyone who has given him clear, 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.

COMING EVENTS - FALL 2012

Nov 1-8 **Robert Hall Originals - Annual Fall Open House**
Canadian made pewter gifts & jewellery for Christmas gift giving
Thursday, November 1 to Thursday, November 8
10 am-5pm each day
138 Sugar Maple Road, St. George Ontario
Contact: inquiry@roberthalloriginals.com (519) 448-1236 or 1-800-360-2813
Website: http://www.roberthalloriginals.com

Nov 10 **CMMA Fall Mini-Conference**
Burlington Arts & Cultural Center, 1333 Lakeshore Road, Burlington, ON
Contact: Bill Lechner at 416-438-8908 or bill.lechner@rogers.com
Website: http://canadianmicrominerals.ca/

Nov 21 **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 at www.rom.on.ca/programs/id_clinics.php