Voice of the Dinosaur

Newsletter of the
Kawartha Rock and Fossil Club

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LAST REGULAR MEETING
February 12, 2013

The meeting was chaired by the new President, Robert Montgomery. Committee reports were given and approved. There was some discussion of Show preparations.

George Thompson is in charge of display cases. If you wish to display any items or have a fossil or mineral you wish to enter in The Best Fossil or Best Mineral Collected in 2012 Competitions, contact him:

Email: TrueNorthMiner@aol.com
Phone: 613-395-5896

preferably before Feb. 28.

A presentation was given by Mark Stanley and Tom Jenkins on "How not to protect your collection.", stressing the importance of clearly labelling, cataloguing and properly storing the items in a collection in order for them to retain any value.

NEXT MEETING

Date - March 12, 2013
Place - Orientation Centre, Peterborough Zoo
Time - 7:00 pm
Agenda - Regular business meeting.

There will be an open discussion on comments made on the Mindat website relating to interest in rock and fossil collecting.

Direct link:
http://www.mindat.org/mesg-6-282951.html

"How is your mineral club doing?" by Greg Kokolus, posted 01/25/2013 found in the "Message Forum" "General". Members are requested to come to the next meeting with their own comments.

Tom Jenkins is still accepting clean, clear milk bags for Kids' auctions.

The Show is March 2 and 3, 2013. All members get in free by showing their paid up membership cards at the front entry desk.

THE FOSSIL CORNER
Edrioasteroids
by Kevin Kidd

Edrioasteroids are an extinct class of animals within the phylum Echinodermata, and as such, are related to starfish, sea urchins and crinoids. Edrioasteroid comes from the Greek "hedraios" meaning sedentary or stationary and "asteroidea", the starfish. The most common name for these creatures is "seated stars", or just plain Edrios. The entire class is extinct, ranging from the early Cambrian Burgess Shale to the Permian, 540-275 million years ago. There is an older animal, called Arkarua, known from the Ediacaran/Precambrian Flinders Ranges in South Australia that may in fact be an edrioasteroid. It is known only from negative impressions and there is no apparent water vascular system common to all echinoderms, but if it is ever proven to be an edrio, it would not only be the oldest known, but it would also be the oldest known echinoderm of any type.

All edrioasteroids share a common, relatively simple body plan. The animal consists of a more-or-less round theca (main body) composed of many small plates, but the most striking feature common to all edrios is the 5 arms, or *ambulacra*, contained within the body wall and radiating from the central mouth outwards (Figures 1 and 2).

Figure 1.
Isorophusella incondita
From the very top layers of my regular hunting grounds.

Figure 2.
Small but very rare undescribed species of Cystaster. Ordovician, Verulam Formation, Brechin ON. The largest of the group is 4 mm in diameter.

The arms could be either straight or curved, and when curved, could either all be curved in the same direction, or have one or two curving opposite. Within a species, the arms all curve the same, not randomly, and it's that curvature as well as the plate ornamentation that distinguishes one species from another (Figure 3,this page, Figures 4 and 5, next page).

Figure 3 shows *Edrioaster bigsbyi* with four arms curving counterclockwise and one curving clockwise. A similar species, *Edriophus laevis* has all five arms curving clockwise.

Figure 3.
Edrioaster bigsbyi
Ordovician, Verulam formation, Brechin, ON. 3.3 cm diameter.

Figure 4.
Foerstediscus grandis
Ordovician, Bobcaygeon formation, Brechin ON.
3.2 cm diameter.

Figure 5.
Cryptogoleus chapmani
Ordovician, Bobcaygeon formation, Brechin ON. 2cm diameter each .

The anus is situated under the mouth (ewww!!!!) and is made of small triangular plates forming a cone-shaped area. The underside of the theca is plated in the majority of species up to the mid-Cambrian. These species likely adhered themselves to the substrate using mucous and are never found attached to shells or hard surfaces. By the Ordovician, this had changed and the edrioasteroids were unplated on the underside and had to be attached to a firm surface using what is called the *peripheral rim*. Some edrios had a "pedunculate zone" on the underside and could extend on a stalk rather than being confined to the seafloor. This gave the animal the ability to move its mouth around while still being "rooted" to one spot.

At the quarry I most often visit, there are several edrioasteroid layers, with the most prolific one being at the top of the quarry. The problem is that a centimeter above or below that specific layer, there aren't any edrios to be found. Imagine it like this, look at a dictionary from the edge and try to pick out the specific page a word is on. If you're as little as one page off either way, you won't find the word. A study was conducted at this particular quarry in the 70's, when they were still working the top levels. 390 edrioasteroids were collected, with 95.4% (372) of them being *Isorophusella incondita* (see Figure 1) and the remainder being *Cryptogoleus chapmani* (see Figure 5). Of those specimens, 62% were attached to bivalve molds, 23.5% were attached to Rafinesquina brachiopods, 5.3% were on other faunal skeletal elements such as cephalopod molds, trilobite fragments and bryozoans, and the remaining 9.2% were attached directly to the seafloor (hardground). From my own collection, I have several on the hardground, several on brachiopods and one on a cephalopod. I have nothing on a bivalve, nor have I ever seen one preserved that way. Those early collectors cleaned the place out.

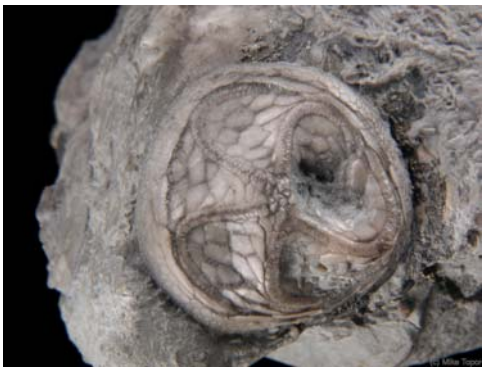

Figure 6.
Very rare Krama devonicum.
Devonian, Arkona formation, Arkona ON.
22 mm diameter.

There are several species of edrioasteroid to be found in the Ordovician rocks of Ontario, with the larger examples coming mainly from the Bobcaygeon formation, as well as rare examples (Figure 6) in the

Devonian . There's also no reason that there wouldn't be Silurian examples, I just don't know of any local examples.

Photo credits-
Figures 1 and 2 - Personal collection

Figures 3, 4 and 5 - Friend's collection at: http://crinus.info (used with permission).

Figure 6 - Collection of Mike and John Topor and taken from the Friends of the UMMP website at: http://strata.geology.wisc.edu/mibasin/ This is a great website featuring specimens from the Michigan basin (Southern Ontario, Michigan and Ohio). Photo used with permission from Mike Topor.

THE MINERAL CORNER
Titanite (Sphene)
Compiled by Sue Kehoe

Nomenclature

The word "Sphene" originally came from the Greek word *sphenos* meaning "wedge", referring to the crystal shape.

Figure 1.

Chemical Composition

Titanite belongs to the class of minerals called *nesosilicates*. It is chemically calcium titanium silicate, $CaTiO(SiO_4)$.

Crystal Structure

In Figure 2, "the calcium atoms fill the gaps between the chains. The interstices between the chains are irregular and surrounded by seven oxygen atoms (gray). Five of them make a roughly coplanar cage and the remaining two are above and below the plane of the diagram. It's a cage with wide openings, but still effective.

The neighboring chains do not quite line up, so the mineral actually has monoclinic symmetry.

The calcium atoms are in purple with the shade indicating two different levels."[1]

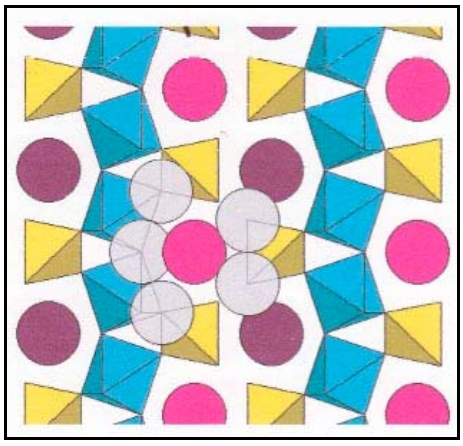

Figure 2.
Atomic structure.

This mineral is monoclinic, and occurs mainly in sharp, wedge-shaped crystals, some are tabular. It can also be lamellar, massive and compact. Titanite is a member of the titanite group which also contains:

Malayaite	**$CaSn(SiO_4)O$**
Natrotitanite	**$(Na_{0.5}Y_{0.5})Ti(SiO_4)O$**
Vanadomayalite	**$CaV^{4+}(SiO_4)O$**

There frequently are impurities with substitutions of Fe, Y, MN, Al, Ce, Sr, Na, Nb, Ta, Mg,V,F, Zr and Sn. Titanite may contain up to 10% tin and/or aluminum. In areas exposed to radiation, it is not uncommon for crystal structure to be broken down by the radiation (a term called being metamict).

The broadest faces on a crystal are n{111} and M{110}. These are usually prisms or prisms combined with a pinacoid on c{001) and a{100}. Twinning may occur on a{100} as an opposed pair.

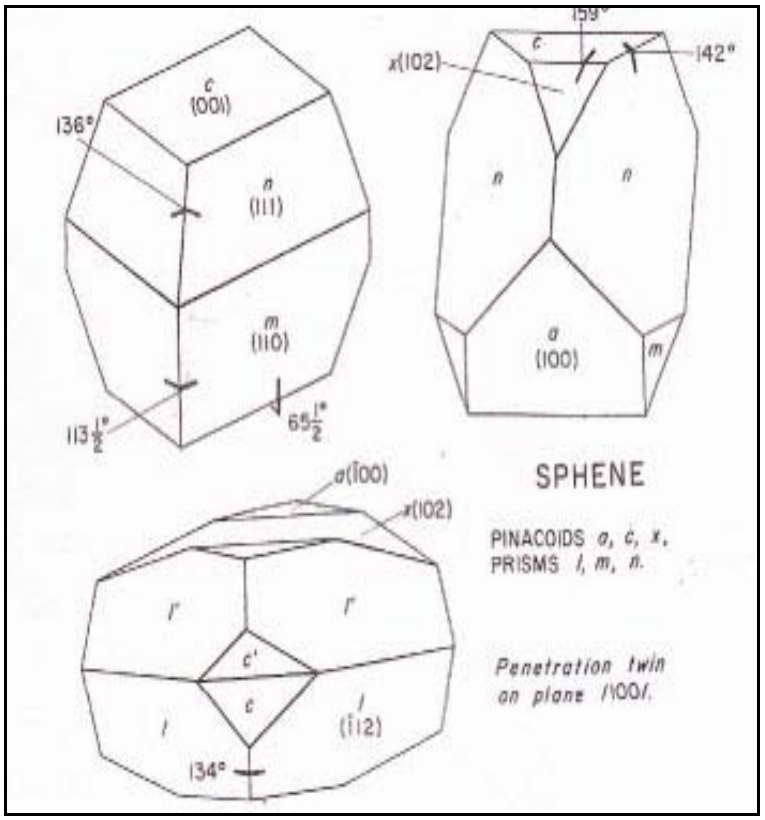

Figure 3.
Crystal shapes.

Physical Characteristics

Tenacity:	**Brittle**
Fracture:	**Concoidal**
Cleavage:	**Parallel to m{110}, imperfect**
Hardness:	**5-5.5**
Specific Gravity:	**3.52-3.54**
Diaphaneity:	**Transparent to translucent, some crystals are completely clear and gemmy.**

Colour:	**Black, dark brown, red, yellow, green, blue. Colour may be impacted by mineral impurities. Gem quality brown stones can be heat treated to a lighter reddish brown and colour zoning of a lighter tone around a darker core.**
Streak:	**White to reddish white.**
Lustre:	**Vitreous to greasy, adamantine.**
Fluorescence:	**None, often due to the ability of iron to "quench" the effect.**
Refractive Index:	**1.843 - 2.092 Can be variable depending upon the composition.**
Birifringence:	**0.105 - 0.135 Can be higher than that of a diamond.**
Pleochroism:	**Distinct to strong in shades of basic colour.**
Solubility:	**Is partially soluble in acids.**

Occurrence

Occurs in small grains in granitic rocks. Also occurs in cavities in granitic and metamorphic rocks and in metamorphosed limestone. It also occurs in pegmatities, gneisses, schists and skarns. It is associated with chlorite, epidote, amphibole, feldspar, quartz and in marbles with pyroxene, scapolite, calcite and apatite.

Clear coloured crystals can be confused with chrysoberyl, golden beryl, scheelite, topaz, zircon and idocrase

Uses

Gem quality crystals can be cut into brilliant stones with more fire than diamonds, but are brittle and not suitable for general jewellery use - make fine collector's items.

Titanite is a source of titanium and is mainly used as titanium dioxide in paint pigments, toothpaste, paper and some plastics. Titanium as a metal is used as an alloy in aircraft, ships, missiles, spacecraft mainly due to its strength yet light weight. For the same reasons it is also used in golf clubs and fishing rods, surgical instruments, wheelchairs and crutches, dental implants, as well as synthetic joint replacements such as hips and knees. It can also be found in tennis rackets, sports helmets and bicycle frames.

It is used in heat exchangers in desalination plants as it is resistant to corrosion due to sea water.

Metaphysical Uses

For those who use crystals for energy/metaphysical work, titanite's vibration level is said to resonate with the 3rd eye and will aid learning and stimulate mental activity, allowing a person to absorb new information and be more organized. It also has uses in meditation and improving will power, when associated with the solar plexus. It reportedly helps with health problems related to eyes, ears and teeth.

References

Footnote 1 - www.bing.com/images

***Mineralogy for Amateurs*, Pp.542-544, John Sinkankas, Van Nostrand, New York, 1964**

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***Handbook of Rocks, Minerals & Gem Stones*, Pp.122-123; Walter Schumann, Houghton Mifflin Co. New York, 1993**

***Smithsonian Rock & Gem*, p. 308; Ronald Louis Bonewitz; DK Publishing, New York, 2005**

***Rocks & Minerals*, Pp. 67-68; Richard Dietrich, Brian Skinner, John Wiley & Sons, US, 1979**

www.mindat.org
www.en.wikipedia.org
Figure 1- photo from own collection
Figure 2 -atomic structure www.bing.com/images
Figure 3 - crystal shapes *Mineralogy for Amateurs* as above.
www.healing-crystals-for-you.com

THE EDITOR'S CORNER

How fortunate we are to have such talented people as Sue Kehoe and Kevin Kidd who always have articles ready for each issue of the Newsletter. Words can not convey how grateful I am for their hard work. Without them, the Newsletter would only be a collection of a few words. And my thanks once again, to my husband Ken who reads each Newsletter to pick up on typos, etc.

As always, I urge members to contact me if there are subjects they would like to see covered or if anyone has an article he/she might like to include.
Bev Fox

COMING EVENTS - 2013

Mar 2-3 20th Annual Peterborough Gem, Mineral, and Fossil Show.
Sat. 10-5, Sun. 10-5.
The Evinrude Centre, 911 Monaghan Road, Peterborough, Ontario.
Admission: $3.00 for adults, children 12 or under are free & must be accompanied by an adult.
Directions: From Highway 115 at Peterborough, take the Parkway to Lansdowne St., then East 4 blocks to Monaghan Rd., then North 1 block.
Or travel West on Highway 7 (Lansdowne St.), into Peterborough, turn right at the 6th traffic light onto Monaghan Rd., then North 1 block.
Contact: Robert Beckett at 705 740 4530
Website: http://www.rockandfossil.com/

Apr 6-7 41st Annual Brantford Lapidary & Mineral Society Show
Sat. 10-5, Sun. 10-5.; Paris Fairgrounds, 139 Silver Street, Paris, ON.
Features: One of Canada's Largest Gem & Mineral Shows! Gem, Mineral, Fossil & Stone Dealers, Lapidary Equipment, Supplies, Fine Jewellery, Supplies, Beads, Demonstrations, Exhibits.
Silent Auction Saturday & Sunday
'Mine for Gems' Display
Admission: Adults $5, Children 12 and under - Free
Contact: robert@roberthalloriginals.com or John Moon 519-752-9756

Apr 13 The Kitchener - Waterloo club has kindly agreed to invite other CCFMS members to a trip to the James Dick Quarry, Gamebridge, Ontario, on The eastern side of Lake Simcoe.
Led by Beth Kümmling.
Meet at the quarry at 10:00 AM. Those who wish to car pool can meet at the Highway 6/401 parking lot at 8:00 AM.
Attendees must be equipped with a hard hat, safety boots, safety goggles, and a safety vest, and be prepared to sign a liability waiver

(Beth will provide them at the site).

There are two types of collecting at the Gamebridge quarry: the crush piles, for which small containers or baggies would be most appropriate; and a blast area where there are larger slabs and hash plates, for which a pail, hammer, etc., might be useful. Gloves will come in handy for both areas

The quarry contains trilobites, crinoids, brachiopods and other treasures from the upper Ordovician (Verulam formation).

All must register with Beth before April 10th at bkummling@brucetrail.org or 519-835-9331 or be disappointed.

PROOF OF CCFMS AFFILIATED CLUB MEMBERSHIP WILL BE REQUIRED.

Only so many participants will be allowed.

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**