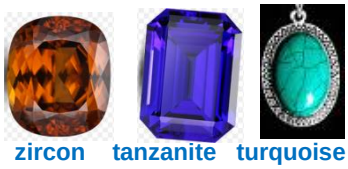
Wayne County Gem and Mineral Club News

December, 2016 **Always Looking for Places to Dig!**

Lake Ontario in November (see page 3)

http://www.wcgmc.org/

December Birthstone



zircon tanzanite turquoise

Even the rocks are happy. They know the WCGMC Christmas party is coming soon.

WCGMC
Christmas Celebration
Friday December 9th, 6:30 PM

Party, Buffet, Gifts, Games and More
Bring a dish to pass
Club provides meat and drinks
Please RSVP with head count
to EvaJane at gwexterior@gmail.com

Two December Workshops
Saturday, December 3rd
Saturday December 10th

Two opportunities to complete that Christmas present for your favorite newsletter editor!
FYI: He likes shiny symmetric things!

When: 10:00 AM til mid afternoon
Where: The Weiler's Barn and Club Workshop
6676 E. Port Bay Rd, Wolcott, NY
Rules: BYOR (Bring your own rocks) to saw, grind, polish or even facet. Training on equipment is available. Eye protection is recommended. $5/adult to offset maintenance costs

2016 WCGMC Rock Olympics

Gary Thomas guides Scott Jones (blindfolded) through the balloons. Note the attentive judges just watching for a rules infraction. Gary and Scott won gold in this event.

The November Club meeting featured competitive rock team events including rock relays, stone tossing, and a blindfolded rock obstacle course. The one woman WCGMC Olympic committee (Linda Schmidtgall) designed the events, prepared the prizes and medals, and then officiated the activity.

…who shall remain nameless!

Mineral Musings

Geology of Curling Stones

by Fred Haynes

A long time ago, back in the early 16th century, a few energetic Scotsmen decided to slide stones on a frozen river at a fixed target as a form of competition. The sport of curling was born. After all one cannot golf in the winter!

Early evidence of "curling" appears in this painting by Peter Bruegel. The 1565 painting is entitled " "Hunters in the Snow", but the activity on the ice includes curling or some form of rock sliding.

The first clear evidence of the term curling is from 1620 when Scottish poet Henry Adamson wrote of a good friend being "given to the pastimes of golf, archerie, curling, and jovial companie." The oldest documented curling club, the Kilsyth Curling Club in Scotland, is still around today The club's first constitution is dated 1716; I imagine they are having some celebrations this year as they celebrate their tercentenary.

The earliest curling stones were simply flat river stones. They were inconsistent in size, weight, and smoothness and participants would select stones that fit their preference.

Today, curling stones are made of granite and the stones used throughout the world come from just two sources. The traditional source is a quarry on Alisa Craig, an island off the southwest coast of Scotland. However, that quarry produced its last granite in 2013. At that time 2000 tons were removed, enough to supply the world with stones until about 2020. The island has since been declared a wildlife refuge and blasting is no longer permitted. A second, more accessible location, the

Alisa Craig is volcanic plug where erosion has removed the overlying volcanic rock and the less resistant sedimentary rock that flanked the granitic core.

Trefor Granite Quarry on the Llyn Peninsula of northwest Wales, started producing curling stones in 1992 and has established itself as the future source of quality curling stones.

The granites in these two locations have some unique properties that set them apart from other unfractured granites. First and foremost they are virtually impermeable and will not absorp any water. The crystals are tightly interlocked and lack even the finest microfracture. This prevents freeze/thaw action from eroding or otherwise altering the stone. Second, the magma that froze to form the granite was completely homogeneous deep within an otherwise quiet magma chamber. With similar amounts and distributionsof quartz and feldspar, each 44 pound stone cut and polished from the rock is virtually identical is size, weight, texture and ultimately in how it slides and curls when released.

References:

Easter, M., 2014: From Scottish Magma to Sochi Ice: The Geologic History of Curling Stones, Scientific American website, Feb 1, 2014

Various Wikipedia sites

SITE OF THE MONTH

Lake Ontario Stones by Fred Haynes

At our November meeting on Friday the 11th many were bemoaning the fact that the field season had come to an end. That was until Ed Smith and Gary Thomas suggested that we visit the Lake Ontario shoreline on Sunday for one last outing. And so we did. In fact ten of us spent several hours walking the rocky coastline adjacent to Chimney Bluffs State Park. It was our 22nd club field trip of the year, and probably our last.

WCGMC rock heads, or is it hounds, often drive hours (or days) in search of this or that (see page 7), and are already planning such trips for 2017. But, we should never forget that Wayne County has its own glorious locations to visit right in our own backyard and the numerous Lake Ontario rocky beach exposures rank highly in that regard. Crystal terminations may be lacking, rare minerals are scarce, and there are no agates to be found on the south shore of our Great Lake. However, that is made up for by the shear abundance of material and the tremendous diversity offered in the lake stones. You can find fossils brilliantly exposed in the eroding rounded limestone cobbles; straight cephalopods and gastropods are most common. There are gneiss boulders displaying ruby red garnets. The layered sandstones offer wonderful patterns. The alternating bleached and red sandstone rocks of all sizes and shapes are particularly interesting. Epidote and serpentinite offer green, feldspar is orange, and on it goes.

A true petrology smorgasbord in a short afternoon stroll: clastic sedimentary rocks – sandstone (ss.) both layered and irregular red/grey, fossiliferous bioclastic limestone with gastropods (G) and cephalopods (C), igneous granite (blue arrows), metamorphic gneiss (red arrows) with dark red garnets.

The diversity of rocks found In the same location is a direct result of the rather unique origin of the Lake Ontario beach rocks in the region. The same drumlins and other glacial features that give Wayne County its unique topography and character (WCGMC June 2016 newsletter) are also responsible for the nature of the Lake Ontario beaches along the county's north boundary. At Chimney Bluffs the north-south drumlins are being aggressively eroded by the relentless action of Lake Ontario. With annual erosion rates of as much as 2-5', an incredible amount of new material is churned into the lake water each year. Water level rises in the winter and the combination of wave action and freeze thaw eats into those wondrous chimneys of uncemented conglomeratic material that continental glaciation littered across western New York a mere 10-20 thousand years ago

The inside of a drumlin is exposed along Lake Ontario at Chimney Bluffs. The rocks within the glacial debris were somewhat weathered during transport trapped in ice, but that is nothing compared to the natural tumbler they are exposed to when set free from the drumlins and ground by lake water action.

Clearly the glaciers were not terribly selective about what rocks they picked up and carried across the future US-Canada border. Whatever was in their way was unceremoniously captured in the advancing ice front. Some was ground to rock flour during the slow monotonous ice advance, but a significant amount of rock debris was trapped within the ice and protected from further erosion. This portion would be left in moraines and drumlins when the climate warmed and the glaciers retreated for the final time.

Another interesting aspect resulting directly from this unique origin is that the diversity of rocks includes both very hard quartzite and sandstone rocks as well as relatively soft fossiliferous limestone. Most rocky coastlines result from geologic processes that involve significant sorting and extended periods of winnowing. Soft material is completely removed, and material of variable density is separated into different locations. This is not true along the face of the eroding drumlins of Wayne County. Much of what is seen this fall as rounded, tumbled cobbles was released from the drumlin just last winter or at most the one before. The beauty of this, of course, is that next year there will be an entirely different selection of lake stones to observe.

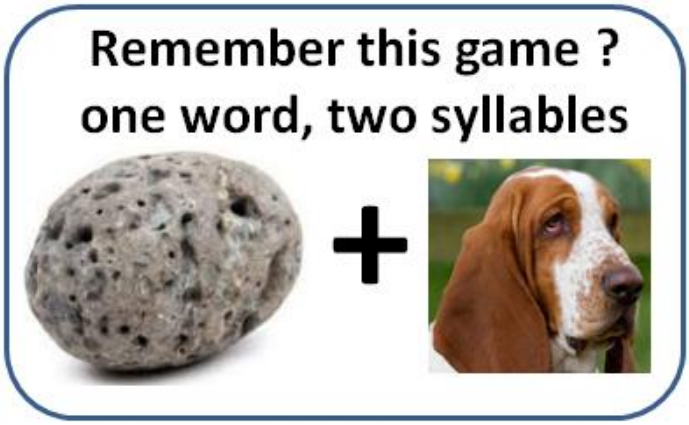
One of my favorite Lake Ontario rock types is the red cemented sandstone breccias. The white cementing host is calcite so these stones will weather fast once exposed. If anyone knows the age and origin of these cemented breccias rocks, I would love to know. The red clasts seem to be a little rounded, but still somewhat angular, and generally of the same size making for a colorful and most interesting rock. The largest rock is 8" by 4" in size.

Some lake rocks are simply best for stacking.

References:

Haynes, F., 2016, Drumlins, WCGMC June newsletter, p 2-3.

So how did Ed Smith encourage ten folks to join him on the shores of Lake Ontario in the middle of November? It was not hard. He simply brought this football sized lake stone that he had found recently to the November meeting. The straight-backed nautiloid in this beach stone was enough to tempt many to the field.



WCGMC Reaches Out

A School Visit Near Watertown
By Kathleen Cappon

Most Kids will be interested in rocks, minerals gems and fossils when they find out that these interesting specimens are right in their own neighborhood, especially a group of 6th grade students! I had just that opportunity to spark an interest with a whole class of them at Glen Park Elementary School in Watertown on Monday ,October 24th.. My great niece, Julia Cappon attends school there. I had gotten her interested in collecting several years ago and she started sharing her rocks and fossils with her classes. A request for me to visit and do a presentation on New York minerals and fossils soon followed. Her teacher, Miss Russell contacted me and we planned a presentation and a date.

I gathered a dozen local minerals and some Devonian fossils for the display table. Upon arrival, I entered their classroom dressed in "quarry get-up" complete with steel toe shoes, vest, hard-hat, safety glasses, and a pail full of necessary tools. Each item drew attention and the use of all was demonstrated.

Since St Lawrence County and areas around Watertown are rich in minerals and fossil locations I brought examples from Benson Mines, Rose Road and fossils from road cuts off of Route 11. I felt I could really inspire the kids to begin collecting by showing a few fluorescent minerals displayed in a black box with a "UV" light. I also had on the table fossils from localities where our club has visited such as Geneseo, Canandaigua, and Lord's Corners. In addition, there were examples of the New York State fossil: (Eurypterid) and the State gemstone (Garnet).

The students also enjoyed talking about their birthstones and rock tumbling. The best thing to conclude the program after the question and answer period, were the 60 Grab Bags! I must tip my hard-hat to our club member Bill Lesniak who not only helped me fill each bag with three minerals but also provided name cards for each specimen !! These were biotite, magnetite (with an attached magnet) and a piece of blue calcite. From my collecting, I added two large horn corals, crinoids, a trilobite two brachiopods and for an extra surprise, fossil shark teeth that I collected in Florida. An added bonus were cards with websites of clubs to join, a local Lapidary Society, and some local collecting sites.

Kathleen has removed her hard hat and is answering questions about the minerals and fossils she took to her niece's class in Watertown. Picture by J. Russell

This rock and mineral day was a big hit with all of the students and teachers alike! Hopefully, the activity inspired these young people to start their own collections. If the wonderful notes they sent me after the event are any indication, it may have done just that. I know I was inspired by their enthusiasm. It was great to be in the classroom again after years of retirement from teaching. I am certain I will be collecting more in up-coming field trips for future presentations.

Victor-Farmington Library
Dan Krisher, Fred Haynes

On October 20th, club members Dan Krisher and Fred Haynes set up tables in the lobby area of the Victor-Farmington library. Dan displayed fossils and had samples of coral and brachiopods to hand out. Fred had six minerals and six rocks for all interested to sample in building their own rock and mineral egg crate collection.

Dan Krisher (seated) and Fred Haynes with Geology Morning at Victor Library. Photo by Tim Niver (librarian).

DECEMBER BIRTHSTONES

Zircon, Tanzanite, and Turquoise

December is a month when many things are overdone. Stores are open 26 hours per day, sales offer discounts on discounts (or so they claim), foods have more calories and portions are larger, etc. With all these other excesses, I suppose it should then be no surprise that December would outdo all other months by having three official birthstones. Zircon, turquoise, and tanzanite are all recognized birthstones for the final month of the year. I guess we had better get started.

ZIRCON:

Chemically and structurally, zircon ($ZrSiO_4$) is a simple mineral, a nesosilicate where individual silica tetrahedral (SiO_4) are linked by single atoms of zirconium (Zr). The brownish-reddish crystals are tetragonal, often with prismatic and bipyramidal faces.

Hyacinth is a name often used in conjunction with gem quality yellow of brown red zircon such as this pair of 3.4 ct round cut gems from Cambodia.

Zircon is an accessory mineral in many igneous rocks, particularly granites and syenites and associated pegmatites. Hard (7.5 on Mohs scale) and chemically resistant zircons survive weathering and can be found in alluvial deposits. Because of zircon's density difference from other minerals (it is almost twice as dense as other silicates) zircons released by erosion accumulate with other heavy minerals where they can be recovered.

Zircon is the principal source of the world's zirconium. With its extremely high melting point, synthetic zirconium oxide (ZnO_2) is used in many high temperature applications such as nuclear reactors and ceramic crucibles.

This pair of 2011 stamps from the French Southern and Anarctive Territory demonstrate the natural occurrence of zircons embedded in host granite (left) and a cut gemstone (right).

In addition to being a December birthstone, zircon has a neat distinction. Zircon crystals are resistant to weathering and chemical alteration and they contain uranium. This allows most zircons to be dated by measurements of the amount of lead generated by radioactive decay of uranium. It is not easy and some zircons resist analysis if damaged, but zircons permitting such work have proven to be the absolute oldest datable minerals on earth. Ages of 4.4 billion years have been recorded in zircons from Australia. Zircons this old are "only" a little more than 100 million years younger than the currently accepted age of our planet.

TANZANITE:

One glance at the brilliant blue gem tanzanite from central Africa and it is clear why this gem variety of the mineral zoisite was added as a birthstone in 2002. Although a bit softer than most other valuable gemstones, the vibrant color and overall scarcity of tanzanite (6.5 on the Mohs scale) adds to its appeal.

Tanzanite: On the left, a 4.03 ct Asschur cut gemstone. On the right, a natural raw terminated tanzanite crystal. Which would you prefer?

The mineral zoisite, itself a member of the epidote group of sorosilicate minerals, has been a known and well defined rock forming mineral for centuries. But the blue and gemmy variety now known as tanzanite was not discovered until 1967 when a farmer in the Merelani Hills area of Tanzania encountered them while tending livestock. It turns out that the blue color is imparted by a very small amount of vanadium in the crystal structure.

Tanzanite has its own unique property. It is very strongly pleochroic, that is it will display different colors when light passes through different crystal directons. This is the front and side (90 degrees) of the same tanzanite crystal viewed with the same light source. Now imagine a gemstone cut from this stone!

If you own tanzanite you may want to hold onto it. The mining areas in Tanzania have been nationalized and a study in 2012 estimated that at the current rate of production (~2.7 million carats/year) the tanzanite deposits may deplete in about 30 years. Of course, exploration for additional tanzanite will likely continue.

TURQUOISE:

Another magnificent blue mineral, turquoise is actually a copper phosphate, or more specifically it is a hydrated hydroxyl phosphate of copper and aluminum. The formula is: $CuAl_6(PO_4)_4(OH)_8 \cdot 4H_2O$. Turquoise forms as a secondary mineral in veins and fissures in arid regions. Although crystalline turquoise is extremely rare, the deep sky blue color of turquoise and its propensity to polish smoothly has led to its extensive use in jewelry.

While tanzanite is a recent discovery, turquoise dates back as far as 3000 BC. Early evidence of its use comes from Egytpian tombs. Notably, King Tut's tomb was extravagantly adorned with turquoise. By the 13th century turquoise dug in Persia (Iran of today) was treasured throughout much of Europe. Meanwhile pre-Columbian Native Americans mined the colorful mineral in the desert southwest and used it in sacred ceremonites to commune with the spirit in the sky. However, the unique combination of turquoise into silver jewelry did not originate until the late 19th century.

Turquoise: With a hardness of 5-6, turquoise is somewhat durable, but soft enough to polish easily. The raw vein style turquoise on the right is from Morenci, Arizona.

Turquoise is often found in association with another light blue secondary copper mineral, chrysocolla, and it can be hard to tell them apart. Chrysocolla is a hydrated sheet silicate mineral with the formula: $Cu_{2-x}Al_x(H_{2-x}Si_2O_5)(OH)_4 \cdot nH_2O$. It is not stable and is also generally too soft and too brittle for lapidary use. Thus, it is important to be able to distinguish turquoise from chyrsocolla. Enter the lick test! Chrysocolla is hydrophillic. Therefore it will feel sticky or tacky if licked. Turquoise will not.

References:

American Gem Society web pages (numerous)

Guide to Gems, 2003, Firefly Books Inc.

Johnsen, O., 1994, Minerals of the World, Princeton Guide Series, 438 p.

Minerals.net and Wikipedia webpages

WGCMC Member December Birthdays

Janis Becker	Ken Rowe
Shirely Cataldo	Cathy Stalker
Jerry Donahue	Steve Underwood
Jamison Duclos	Christine VanNeel
Jeff Frey	

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Glenn Weiler – Workshop Coordinator
Linda Schmidtgall – Collection Curator
Eric Elias: GEMFEST Show Chair
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Fred Haynes – Facebook Administrator

Club meets 2nd Friday of each month starting in Sept.
Social meeting at 6:30 PM.
Regular meeting at 7:00 PM
Park Presbyterian Church, Maple Court, Newark, NY
Website – http://www.wcgmc.org/

Dues are only $15 individual or $20 family for a full season of fun. Renewal is in October Send to:
WCGMC, P. O. Box 4, Newark, NY 14513