November 2020

The Conglomerate

MMS General Meeting

Monday, November 9th

A Virtual Presentation from a Member's Collection

OFFICIAL BULLETIN OF THE

MICHIGAN MINERALOGICAL SOCIETY

MEMBER OF THE MIDWEST AND THE AMERICAN FEDERATIONS

Website: www.michmin.org

The Conglomerate Since 1940

THE MICHIGAN MINERALOGICAL SOCIETY was organized in 1935 by a group interested in furthering the hobby of mineral collecting. The Society is incorporated as a non-profit educational organization and is a member of both the American and Midwest Federations. The purpose of the Society is: 1) To promote interest in the fields of Geology, Mineralogy, Paleontology and the Lapidary arts, 2) To publish articles and information pertaining to these fields, 3) To encourage the collecting and the display of specimens in these fields, 4) To arrange field trips of interest.

The CONGLOMERATE is published by the Michigan Mineralogical Society, which was founded March 1935, and is the Official Bulletin of the Society. Non-copyrighted articles and art work may be reproduced provided "MMS Conglomerate" is given credit. Editor reserves the right to edit articles for length and content.

Membership applications may be obtained at the meetings or by contacting our Membership Chairman, John Vitkay.
Annual Dues: Adults $20.00, Students (under 18) $5.00 New Members: Initiation Fee of $5.00 in addition to annual dues.

The MICHIGAN MINERALOGICAL SOCIETY meets on the second Monday of the month September through June (except October and January) at Cranbrook Institute of Science, 39221 N. Woodward Ave. Bloomfield Hills, Michigan, 48303. Subject to change.

At regular meetings, doors of the Institute open at 7:00 p.m. to allow time for MMS members and their guests to enjoy the mineral hall exhibits. The regular program is held in the Institute's auditorium and begins at 7:30 p.m. Visitors are always welcome.

Board Meetings are held the first Monday of the month (September through June). Time and place to be announced month prior.

Annual Banquet is usually held in January with the time and place to be announced. January banquet is cancelled for 2021.

2020 OFFICERS AND DIRECTORS

2020 COMMITTEE CHAIRPERSONS

MMS Website: www.michmin.org

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OFFICIAL BULLETIN OF THE MICHIGAN MINERALOGICAL SOCIETY

VOLUME 83 NUMBER 7

PRESIDENT'S COLUMN

An evolutionary perspective of our place in the history of the earth reminds us that Homo sapiens sapiens has occupied the planet for the tiniest fraction of that planet's four and a half thousand million years of existence. In many ways we are a biological accident, the product of countless propitious circumstances. As we peer back through the fossil record, through layer upon layer of long-extinct species, many of which thrived far longer than the human species is ever likely to do, we are reminded of our mortality as a species. There is no law that declares the human animal to be different, as seen in this broad biological perspective, from any other animal. There is no law that declares the human species to be immortal."

— Richard E. Leakey

If you read this column, you probably have figured out that my passion lies with minerals. I have been fascinated since I was a young child with the colors and crystal structure of minerals. But, as a youth, I also hunted for fossils. Luckily, growing up in Michigan, I had access to many deposits of fossils – on the banks of Lake Huron, especially.

So, I thought I would use this column to talk a little bit about fossils. Why do people look for fossils? By studying the remains of prehistoric life and the traces it left behind we can learn about how animals and plants lived and behaved millions of years ago.

How Fossils are Made

Living things die and then get buried quickly under sand, dirt, clay, or ash sediments. Usually, the soft parts decay, leaving the hard parts behind. As time goes on more and more sediment accumulates.

Pressure, heat, and chemical reaction cause the sediments to harden into rock. Movements in the earth's crust push the layers of sedimentary rock back up to the higher ground. Finally, through erosion, the fossils become exposed at the surface again.

So what are the ways that dead organisms can turn into fossils?

Unaltered preservation – like insects or plant parts trapped in amber which is a hardened for of tree sap.

Petrification – minerals seep in slowly and replace the original tissues with silica, calcite or pyrite forming a rock like fossils. Most bone and wood fossils are petrified.

Replacement – an organism's hard parts (shells) are replaced by other minerals like calcite, silica, pyrite or iron.

Carbonization – this is where only carbon remains in the specimen and other elements are removed.

Recrystallization – the "hard parts" of an animal revert to more stable minerals or small crystals turn into larger crystals.

Authigenic preservation – molds and casts of organisms that have been destroyed or dissolved.

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Fossil hunting provides an excellent family activity and helps to initiate discussion about the evolution of life on earth and how humans fit into this timeline.

Dave Lurie – MMS President

Announcements

Nomination of New MMS Officers

Every year the MMS selects a Nominating Committee whose task is to seek candidates for the MMS Board (Officers and Directors). The Board positions include President, Vice President, Treasurer, Recording Secretary, Corresponding Secretary, and this year, the position of Director for 2023 as well as two (2) at-large Board members serving a one-year term. Candidates will be announced via email in December (since there will not be an Annual Meeting in person) and candidates will take office pursuant to a majority member vote.

The MMS Nominating Committee for the 2021 Board consists of Millie Hurt (248-398-6693), Dawn Niedermiller (586-907-7657) and Debbie Trelfa (586-755-5126).

New Members!

Welcome to the *Michigan Mineralogical Society*!

MMS Membership. . . Remember, it's a 3 for 1 Deal!

Remember, that as a member of the Michigan Mineralogical Society (MMS), you are automatically a member of two other societies. With paid membership to the MMS, you are also a member of the American Federation of Mineralogical Societies (AFMS) and a member of the Midwest Federation of Mineralogical and Geological Societies (MWF). That's a 3 for 1 deal!

Your MMS membership also allows you to attend any field trip offered by the AFMS and MWF.

For more information on the AFMS, see website http://www.amfed.org

For more information on the MWF, see website http://www.amfed.org/mwf

Look at the MMS Website!

On our award-winning website, you can view much information about the MMS and topics related to our club and hobby. If you hover the mouse cursor over the 'Membership' tab on the website's home page, you will see a 'Members Only' tab. Click on this tab and you will be prompted to enter a password. If you need this member guest password, email MMS President, Dave Lurie at dlurie2001@comcast.net

The 'Members Only' page has the current *Conglomerate* newsletter and archives that can be accessed. In addition to full color newsletters, there is much more information including the MMS By laws, MMS Member Directory, field trip information, past MMS Club presentations, and other club's publications of interest. Our MMS website also has many Educational 'Links and Resources'.

Have fun exploring our site! There is so much information and many interesting articles!

Share your Rockhounding Stories!

Do you have a story or experience related to our hobby that you would like to share with fellow club members? Did you participate in one of our recent field trips, take a summer vacation and collect rock, mineral or fossil treasures, or do you have a favorite mineral you would like to tell us about?

If you have something that you would like to share, send it to the editor of the newsletter, Dawn Niedermiller (contact information on the inside cover of this newsletter). Sharing our experiences is what the club is all about, and it is a way for us to stay connected, especially now when we need to social distance.

The Scoop from the VP on the October Meeting

"***Mineral and Crystal Habits – How Minerals Behave and a Common Language to Describe Them***"
A virtual presentation

For our October Zoom meeting we discussed Crystal and Mineral Habits. You may have noticed that there are certain behaviors that are consistent over the mineral families and they will often display the same look and crystal "habits" all over the world no matter where they are found. A great example is the hexagonal quartz crystals that many of us have in our collections. These are found all over the planet and exhibit the same qualities and crystal structures where they are found.

A mineral Habit from geology.com
Crystal habit is the tendency for specimens of a **mineral** to repeatedly grow into characteristic shapes. These shapes are influenced by the atomic structure of the mineral, but they can also be influenced by the environment of crystal growth. Regardless of influence, crystal habit shapes are characteristic of the mineral and displayed by many specimens of that mineral.

The Following list is some examples of Crystal Habits. It may help you to identify a mineral or to even explain to someone else what a mineral looks like in a common terminology that is used around the world.

Acicular crystals have a hair-like shape that tapers to a point or a blunt termination. Many acicular crystals can be clustered to produce fan-shaped or radially-shaped aggregates. The name acicular should be used when the length of an individual crystal is much greater than its width or diameter. Mineral examples include rutile, natrolite, millerite, scolecite, and gypsum. Often called a **Spray**.

Banded minerals have narrow layers or bands of different color and/or texture. These may be a response to changes in the composition of the growth liquid, the sedimentary process, or other conditions. Mineral examples: quartz (agate), malachite, rhodochrosite, and fluorite. The photo above shows rhodochrosite cabochons that display a banded habit.

Bladed crystals are elongated. They are much longer than they are wide, and their width exceeds their depth. They are shaped like a straight sword or knife blade. Their ends sometimes taper to a point. They might exist as single crystals, a cluster of many parallel crystals, or radiating clusters of crystals. Mineral examples: kyanite, actinolite, and stibnite. They often have a different hardness in one direction over the other.

Botryoidal (also known as globular or mammillary) is derived from the Greek word botrys, which means "bunch of grapes". This habit name is used for crystal aggregates that have a globular or rounded shape. Mineral examples: hematite, malachite, smithsonite, hemimorphite, variscite, quartz (chalcedony), quartz (grape agate), and goethite.

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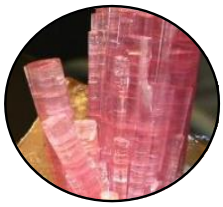
Columnar crystals are long prisms with enough width that the name acicular (or needle-like) does not apply. A single "column" might contain multiple parallel crystals. Mineral examples: calcite, tourmaline, spodumene, and gypsum.



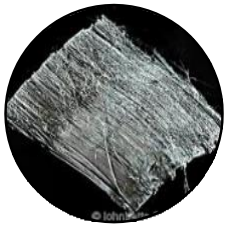
Cubic crystals form square faced patterns like the name describes. Fluorite and halite are two common minerals with a cubic shape. Cubes have six square faces and four-fold rotational symmetry around three axes.

Dendritic crystals form a branching pattern, much like the branches of a tree, the veins in a leaf, or the branching pattern of streams in a drainage basin.

Dodecahedral is any polyhedron with twelve flat faces. The dodecahedron is one of the most common forms for garnet crystals and sometimes forms in pyrite as well.

Doubly Terminated is a name used for a prismatic crystal that has a natural termination on both ends. Normally, crystals have a termination on one end - because the other end of the crystal was attached to the ground, the roof of a cavern, or a surface that it was growing on. The doubly terminated crystals composed of quartz and are known as "Herkimer diamonds" (a misnomer).

Drusy is a habit name used for a surface that is covered with small crystals. The crystals themselves are referred to as a druse. Quartz is the most common mineral found as a druse. Other mineral examples: uvarovite garnet, malachite, and azurite.



Fibrous is a habit name used when minerals occur in very fine fiber-like crystals. They are often so fine that they look like fine hair. The habit also includes aggregates made up of a large number of parallel or radial fibers. Mineral examples: actinolite, asbestos, chrysotile, tiger's eye chatoyance, and tremolite.

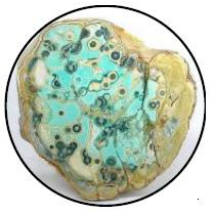
Foliated (also known as **Micaceous** or **Lamellar**) is a sheet-like or layered structure. Minerals with a foliated habit are often able to be split into thin sheets. Members of the mica family are the best examples of a foliated habit. Clay minerals and graphite can be described as having this habit, but their foliation is on a microscopic scale. Mineral examples: muscovite, biotite, and chlorite.

Geodic (like a Geode) is a habit in which mineral aggregates form a rounded or oblate mass by crystallization on the inside walls of a cavity. Concentric bands or layers of mineral crystals subsequently develop, gradually infilling the cavity without infilling it completely and with a crystal-lined central void.

Granular is the habit of a crystalline aggregate composed of many rounded or equant anhedral crystals of approximately the same size. The crystals might be loose with no interstitial material, or they might be interlocking such as calcite grains in a marble. Mineral examples: olivine, bornite, and scheelite. This can be difficult to discern from Drusy depending on the specimen.

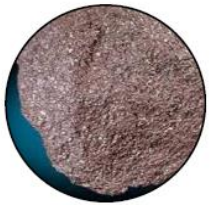
Hopper crystals are partially formed crystals that have experienced more rapid growth on their outer edges than in the center of the crystal. This causes them to be well-developed on the outer edges but less developed or "hollow" in the center. Halite is one of the best-known examples of a mineral that sometimes displays the hopper crystal habit. Other mineral examples: galena, bismuth, and ice.

Massive is the habit name used for masses of crystals that have no distinctive geometry. Most specimens of almost every mineral do not exhibit an obvious habit or obvious crystal form. Good examples are serpentine, rose quartz, jade and jaspers.



Nodular, **Nodules** or **Concretion** is the name of a habit in which mineral crystals grow to form rounded or bulbous structures. The crystals are usually arranged in a radial structure within the nodule, even though the nodules may exhibit concentric banding. In the concentric banding, each layer is composed of crystals growing up and outward from the layer immediately below. Mineral examples: Agates, azurite, hematite, septarian, turquoise, and variscite.

Octahedrons have eight triangular faces and three axes of four-fold rotational symmetry. They from diamond like shapes (as in the diamond on playing cards.) Great examples are diamonds and fluorite. Also called **Bi-Pyrimidal**.



Oolitic minerals occur in crystalline aggregates that are rounded and less than about four millimeters in size. Oolites form by chemical precipitation from a solution. Similar to pisolitic, but oolites are much smaller than pisolites. Mineral examples are hematite and calcite.

Pisolitic minerals occur in crystalline aggregates that are rounded and about the size of peas. Individual pisolites are made up of many tiny radiating mineral crystals. They often develop a concentric structure formed when crystalline aggregate layers grow to enlarge the pisolites. Similar to oolitic, but pisolites are much larger than oolites. Mineral example: bauxite.

Prismatic is a habit name for minerals that form in elongated crystals with opposite faces normally parallel to one another. The crystals are often striated along their length (as in tourmaline) or across their width (as in quartz). Mineral examples: tourmaline, quartz, beryl, hornblende, augite, diopside, and topaz. These can be hard to distinguish from columnar crystals.

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Radiating crystal aggregates grow outwards from a central point. They consist of multiple crystals growing in diverging directions. Mineral examples: wavellite, pyrite, pyrophyllite, rutile, and kyanite. Sometimes called a Spray. When viewed from the outside, as a circle they may be called Globular and be confused with botryoidal.

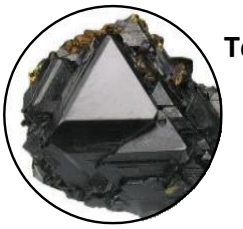
Rosettes are clusters of tabular crystals in a radial arrangement that have an external geometry that resembles a rose or flower. Barite and gypsum sometimes form crystals of this shape in sand to produce a rosette with a sandy appearance. Mineral examples: barite, gypsum, pyrite, and marcasite. Rosettes can be difficult to tell from tabular on occasion.

Scalenohedron are polyhedrons having twelve sides, each in the form of a scalene triangle, that is topologically equivalent to a hexagonal bipyramid and whose middle section can be said to inscribe a rhombohedron. More commonly, it refers to geometric crystals of differing proportions or incased inside each other at differing angles and geometric shapes. Mineral examples of this are pyrite, rhodochrosite sometimes, sphalerite and calcite.

Stalactitic (or **Colloform**) is a habit name used for specimens that have formed as stalactites or stalagmites. The crystals often grow downwards or upwards in a cavity or cavern, yet they have a radial internal cross section. Mineral examples: calcite, malachite, goethite, and quartz.

Striations are fine, slightly indented lines that are present on the faces of some crystals. They always parallel a crystallographic axis and one of the edges of that crystal face. Mineral examples: pyrite, tourmaline, quartz, feldspar, euclase, and topaz. These often form on the sides of Prismatic crystals.

Tabular crystals are flat and plate-like. They have lengths and widths that are much larger than their thickness. An easy way to describe their shape is to compare them to a tablet computer or a tablet that you use to write notes. Mineral examples: feldspar, topaz, vanadinite, barite, and corundum.



Tetrahedron minerals form crystal structures in tetrahedron patterns. The tetrahedron has only four equilateral triangular faces (unless modified), four points and six edges and when sitting on one face looks like a trigonal pyramid. Mineral examples are Sphalerite, and tetrahedrite.

In addition to mineral habits, there are also crystal habits that should and can be considered when trying to describe what minerals look like. Pythagoras did an excellent job of picking up on the ancient knowledge that was passed down to him about the "perfect solids" that defined the building blocks of the universe. While we have moved beyond many of his thought on the makeup of matter scientifically, these shapes still help define the mathematics behind crystal behaviors.

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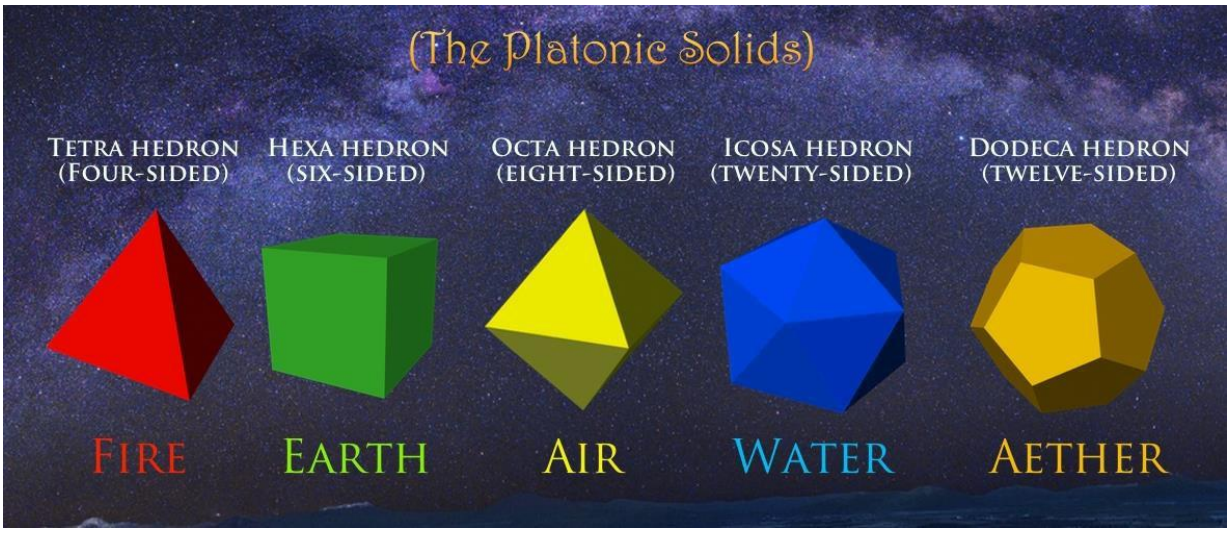

I should note that I included some additional mineral behaviors and examples that I considered important in the presentation for an overarching knowledge of the Mineral Habits. The presentation can be found on our members only page on the MMS website.

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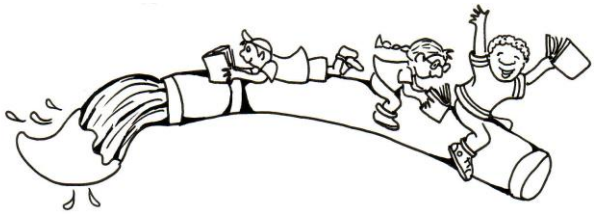
November Meeting…Monday, November 9th at 7:30 pm

A Virtual Presentation of a Member's Collection

Kid's Corner

A newsletter feature from our former MMS Education Chair, John Peters



MINERALS and PRODUCTS

Here is a classroom activity requiring students to link everyday products with the minerals used to create them. Sets of minerals are compared with sets of products made from them, and the students must match up the two using what they know or can tell about the properties of both. This is an introduction to minerals for elementary students.

Assemble kits (e.g. old egg cartons) that contain 10 minerals which are used in products. Collect samples of the products as well (or pictures of them, if needed).

Make enough mineral kits so that every 2-3 people will have one kit. The mineral names and formulas should be provided for the minerals. Here is a table of recommended minerals, formulas, and products:

Apatite	$Ca_5(PO_4)_3(OH,F,Cl)$	fertilizer pellets
Bauxite	$Al_2H_2O_4$	aluminum foil
Calcite	$CaCO_3$	toothpaste, Cheerios
Chalcopyrite	$CuFeS_2$	penny, copper wire
Galena	PbS	fishing weight (sinker)
Graphite	C	pencil
Halite	$NaCl$	table salt
Hematite	Fe_2O_3	blush makeup
Quartz	SiO_2	glass drinking cup
Talc	$Mg_3Si_4O_{10}(OH)_2$	baby powder

It should be clear which name and formula matches which mineral in the kit. The formulas can be attached to the kit lids, printed and handed out separately, or projected.

PROCEDURE:

Students should number a piece of paper. Numbered products can be either placed around the room (so that groups can walk around the room with their mineral kits to view the products) or passed around. Students write the product name next to the number and then look at the samples in the mineral kit to find the mineral that they think the particular product is made from. They then write that mineral name next to the product on their paper. Alternatively, photos of the products (and their ingredient labels) can be projected on the screen.

Tell students that many pairs can be matched based on the mineral properties, but for other pairs, they may need to read the ingredients.

Source: https://serc.carleton.edu/integrate/teaching_materials/mineral_resources/activity1-1.html

~ UPCOMING EVENTS ~

Please note: Many events have been cancelled due to the Covid-19 pandemic. Double check before you make plans to attend or travel. If you find a show or event to attend, enjoy yourself, but please also take care of yourself!

MMS Board Meeting, November 16th by phone. Board members will not meet in person, teleconference call instead.

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Nov 9th: Virtual MMS General Meeting

Not at Cranbrook Institute of Science.

Online presentation, "***A Virtual Presentation of a Member's Mineral Collection***" by Guest Speaker, Bob Ruby. See page 9 for more details.

Time: Nov 9th, 2020 07:30 PM America/Detroit

Join Zoom Meeting:

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Nov 26th:

Happy Thanksgiving!

Virtual Field Trips!

The Internet is wide open! So, for your at-home collecting pleasure, here are some virtual field trips you can take to visit some fabulous Museums:

Smithsonian Museum Of Natural History

David Friend Hall, Yale Peabody Museum of Natural History

South Dakota School Of Mines & Technology

Source: *AFMS Newsletter*, May 2020; via *The Strata Data, April 2020.*

Please share your rockhound stories! WE would love to hear from you. See page 7 to find out how to do so…

For mineral shows and events, see below. Make sure to check for cancellation.

Show Listings

Midwest region, check the following:

MWF Event Calendar

For all shows nationwide check:

Rock and Gem Show Dates

Look at the MMS Website!

www.michmin.org

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From your Michigan Mineralogical Society Family...

Join us
online for our
MMS November Meeting!

See page 9 for details!