

THE ROCKFINDER

Newsletter of the Michiana Gem and Mineral Society

Volume 48, Number 8

October, 2008

Next meeting: October 26

Visitors are always welcome.

Doors open at 1:30. Meeting starts at 2.

Place: Our Redeemer Lutheran Church 805 S. 29th Street (29th & Wall) in South Bend, River Park area.

Program: Travels with Tom. Tom Noe will bring samples and photos and describe some collecting trips on public lands in Wyoming, Montana, South Dakota and Oregon.

Refreshments: Florrie Schuler, Pat McLaughlin and Marsha Miller

TIME TO PAY DUES!

Michiana Gem & Mineral Society membership dues for 2009 are due! You can 1) mail them to Lana Wright or 2) turn them in at the October meeting or at the December 7 Christmas party. Please use the green form inside the front cover of the *Rockfinder*.



UP & COMING SHOWS

OCTOBER:

18-19: CHICAGO HEIGHTS, IL. South Suburban Earth Science Club. Prairie State College, Sat. & Sun. 10:00-5:00. CONTACT: ssescus@yahoo.com.

18-19: CLIO, MI. Flint Rock & Gem Club. 300 Upland Drive. Sat. & Sun. 10:00-5:00.

24-26: MASON (LANSING), MI. Central Michigan Lapidary & Mineral Society. Ingham County Fair Grounds, Fri. 6:00-9:00, Sat. 10:00-7:00, Sun. 11:00-5:00.

25-26: CUYAHOGA FALLS, OH. ANNUAL FALL GEMBOREE. Emidio & Sons Expo Center, 48 E. Bath Road. Sat. 10:00-7:00, Sun. 10:00-6:00. www.LapidaryClubofOhio.org.

25-26: DAVENPORT, IA. Black Hawk Gem & Mineral Club. Mississippi Valley Fairgrounds, Sat. 10:00 to 6:00, Sun. 10:00-3:30. www.blackhawkgemandmineralclub.com.

25-26: EVANSVILLE, IN. Evansville Lapidary Society. Washington Sq. Mall. Sat. 10:00-9:00, Sun. Noon-5:00.

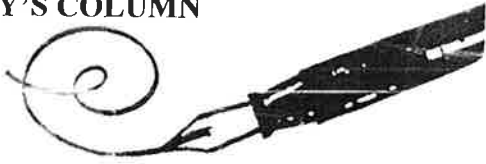
27-28: OSHKOSH, WI. Oshkosh Earth Science Club. Winnebago County Fairgrounds.

NOVEMBER:

1: TAYLOR, MI. Midwest Mineralogical & Lapidary Society ANNUAL AUCTION. Democratic Club of Taylor, 23400 Wick Road. Sat. 6:00, dws@dances-with-snakes.com.

10-11: FREEPORT, IL. Northwest Illinois Rock Club. Highland Community College, www.stephenson-county-il.org.

KATHY'S COLUMN



The last few months have really been busy for our club, with a super field trip and a great September meeting. Thank you to all who brought in displays from your collecting and the pictures that were taken. I am sure we, as well as the guests and new members, enjoyed your contributions. Of course the banquet of food helps too. **Cordelia Tomasino**, as always, has the junior members active with hands-on rock-related projects they can take home.

We still have another one-day field trip to go, an important October meeting and our annual Christmas party for this year.

Marie & Bill Crull and **Joe Perry** are already hard at work regarding next year's show. Hats off to them! Thank you for accepting as chairs again.

Also hats off to our treasurer **Lana Wright**. Lana never seems to have time to enjoy the lovely array of hospitality snacks that are provided after the meeting, or it's on the run as she accepts dues, bills, and writes checks. This is only a small part of the job of being treasurer. Thank you, Lana.

I hope you will all mark your calendars to attend the October meeting. At this meeting the Christmas party will be discussed, you can start paying your 2009 dues and next year's bus weekend field trip sign-ups will be taken. This field trip promises to be another excellent hunting trip.

Next year is looking great for club anticipation and participation for *all* ages. Here, I would like to say if you are interested in serving on a committee or having more involvement with the club, check out the *Rockfinder* and speak to our committee chairs, they would appreciate and welcome your help.

Very important, if you would like to run for office, the slate is open and nominations take place at the October meeting. The current officers are willing to step down and let you have a chance to serve on the board or council. We would offer you advice and certainly help you get started. Too

many years holding one job can make for staleness and lack of interest in a club, so *change is good!* Don't be shy to step up and volunteer.

I am looking forward to seeing you, having a good October meeting and program, with great food and fellowship this month.

Kathy

MINUTES OF THE SEPTEMBER MEETING

Vice-President David Peltz called the meeting to order at 2:00 p.m. on September 28. In attendance were 39 members, 8 junior members and 3 guests. Randy Hill led the Pledge of Allegiance.

President Kathy Miller welcomed new members, guests and past presidents. Don Church made a motion to accept the minutes of the last meeting as printed in the *Rockfinder*. Sister Jeanne seconded the motion. Motion carried. The treasurer's report will be given in October.

LIAISON:

Sally Peltz – Sally has flyers for shows for the rest of the year. The American Federation has apparel for sale if the club members are interested.

AMERICAN FEDERATION:

Bob and Kathy Miller – Bob and Margaret Heinek have been awarded the Rockhound of the Year Award for their continued involvement and many years of dedication to the hobby and club. Big congratulations to them both!

Tom Noe won fifth place as editor of the *Rockfinder* in the Midwest Federation's contest for small bulletins.

MIDWEST FEDERATION:

Sue Brown – *Rock and Gem* magazine is requesting clubs to register on their web site so people who are interested in visiting our area can contact someone in the club for information.

COMMITTEE REPORTS – David Peltz

EDUCATION: Jessie Zeiger – There is a display in Edison School.

FIELD TRIP: Kathy Miller – There will be money for a field trip next year.

HISTORIAN: Ed Miller – Needs photos and memorabilia of the club for the last 25 years for a club book. Would like photos of this year's trip also.

HOSPITALITY: Pat McLaughlin – Sally Peltz, Patty Enos and Yvonne Church furnished the refreshments today.

JUNIORS: Cordelia Tomasino – The juniors showed the club members the etchings they made on slate. Next month they will paint rocks for paperweights.

LIBRARIAN: Pat Bell – There are two new books in the library.

MEMBERSHIP: Marty Perry – If you do not have a nametag please contact me and I will have one made for you.

SHOW: Marie Crull – There were many good reports on the show from the dealers. Marie has volunteered to be the show chair next year.

SUNSHINE: Sally Peltz – Sent Terry Smith a card. He had back surgery.

WEBMASTER: Jim Daly – The web site is up to date. He would like photos of the show and the field trip. <http://www.sauktown.com/Michiana>.

NEW BUSINESS: A thank-you note was sent to Tom Enyart for the stained glass club logo he made for the club. It will be displayed at every meeting. Kathy Miller will set up a field trip to Granitech on October 25.

OPEN DISCUSSION: Bill Crull suggested that we buy our own sound equipment for the show. He is willing to check into the cost. Don Church made a motion we purchase our own sound equipment and let Bill Crull check into it. David Peltz seconded the motion. Motion carried.

The Three Rivers club in Fort Wayne and the Kalamazoo club have asked us for joint field trips sometime.

If anyone wants to look for geodes around Bloomington, contact Ed Miller and he can give you directions to some good places to look.

Kathy Miller reported there were good responses from out-of-town people who were at the show.

UPCOMING FIELD TRIPS

1st field trip – Elkhart day trip October 25

Mr. Allen Boling, the manager at Granitech, has given us another collecting date. For those of us who just can't get enough of that beautiful granite, he is letting us collect on **Saturday, October 25, from 8:00 to 11:00 a.m.**, rain or shine. Be sure to bring a pair of gloves, since some of the granite slabs have rough edges. You should find all sorts of shapes and sizes in many colors. This is the day before our regular club meeting. See you there.

2nd field trip – Club-subsidized bus trip to Keokuk, Iowa, in 2009

We have set a tentative date for Friday through Sunday, September 25-27, 2009, leaving Friday at 4:00 p.m., returning Sunday sometime between 6 and 7 p.m. on a Cardinal 56-passenger bus. We will be looking for **Keokuk area geodes with inclusions of quartz crystals, pyrite, barite, selenite needles, dolomite, sphalerite, kaolin, aragonite, goethite, hematite and pink dogtooth calcite.** Mr. Tim Scheffler has opened up his quarry again for hunting. Like the last time we went in 2002, he does charge a fee.

I should know by October's meeting if the Rocktober Fest will be held that weekend in Keokuk. The sponsors have vendors and rock-collecting field trips. If it isn't that weekend, we will check out the Riverboat Museum (for a small fee) and I will be contacting Jacob's Geodes for collecting on Sunday morning. His quarry is just across the Mississippi River in Hamilton, IL.

We will be staying at the Fairfield Inn where we stayed last time, with full hot breakfast (really good) and an indoor pool. They will be giving us a block room (20 rooms) rate. For dinner that night, the Millers and the Churches had discovered the Black Hawk Restaurant the last time we were there, and I will be making arrangements with them. They are just a walk across the parking lot and have a private dining room.

I will speak more about prices, date and arrangements at the October meeting and bring a sign-up sheet.

Kathy

*Book Review***THE MAP THAT CHANGED THE WORLD:**

William Smith and the Birth of Modern Geology

By Simon Winchester

Excerpted from a review by Tom Helfrich of the San Diego Mineral & Gem Society

The text weaves references to geological formations and fossil classifications with historical facts that defined the life and times of William Smith.

Traditional English society was clearly divided into classes—nobility, old money, military officers and common folk. But, at the time of Smith's birth in 1769, England was in the midst of the Industrial Revolution. Coal, iron and canals were creating a new economy. Improved printing presses allowed books and newspapers to reach agricultural communities and a young William Smith was quick to realize that the "pound stones" used by local farmers to weigh produce were similar to sea urchins found in tide pools in coastal communities. Furthermore, many other fossils were to be found in the fields, each fossil type in a unique soil.

After completion of primary school, Smith apprenticed with a local surveyor. This provided him ample opportunity to travel the south of England while exploring for new outcroppings of coal and planning the canals that would deliver the "black gold" to industry. Smith aptly observed that the folded and faulted layer of coal was always sandwiched between specific fossil-bearing sedimentary layers. Fossils in the upper layer were more modern than those in the lower layer. By the time his apprenticeship was completed, he presented the first theory of geological stratification. He frequently rubbed elbows with intellectuals Joseph Priestly (who isolated elemental oxygen), Herschel (who discovered uremia) and other members of the informal Bath agricultural, philosophical and literary societies.

Smith moved to London and established his own surveying business. Friends encouraged him to finalize his geological survey maps and his theories. Meanwhile, wealthy members of the newly formed Geological Society of London blatantly traced his maps and plagiarized his concepts. Fossil collecting, after all, was the exclusive domain of the wealthy



leisure class for the purpose of stimulating after-dinner conversation. Smith published his first geological survey map with precise explanations in 1815. Meanwhile the Geological Society, under the leadership of George Belies Greenough (famous for "Little Liver Pills"), published a collection of incomplete maps with incomplete descriptions. The wealth and power of the society's members caused Smith's superior product to be ill-received.

Failure of his publication pushed Smith into deep financial troubles. He sold his premiere fossil collection to the London Natural History Museum at a price well below value, then was given only a small part of the price at time of delivery. Debtor prisons were already overcrowded when Smith entered in 1819. It would be several years before friends would obtain his release. It was a weary William Smith who once again set out to survey the land. Meanwhile, the Geological Society underwent slow changes to become a more focused, intellectual organization. They presented the first Wollaston Award to Smith in 1831, and proclaimed the aging surveyor the "Father of Geology." The Natural History Museum finally paid their debt, and King George III awarded him a modest pension. Smith died a few years later but his map still hangs proudly at London's Burlington House.

This book is well-written, easy to read, and difficult to put down. Though it is not a technical resource, its inspirational value makes it a bargain. Next time you are in the field and whip out your USGS maps, perhaps you will recall the life and times of William Smith. For those of you who follow present government policies affecting rockhounds, it seems things haven't changed all that much since 1815!

The Pegmatite (Dec., 2002)

NEW MEASUREMENTS CHANGE PECKING ORDER FOR DINOSAURS

By Dale Gnidovec

For decades, *Tyrannosaurus rex* was known as the king of the dinosaurs. Even its name, which translates as "tyrant reptile king," suggests that. Although not the biggest dinosaur by a long shot — most of the sauropods were much bigger — for a long time it was the largest known of the theropods or carnivorous dinosaurs.

A few years ago, the status of *T. rex* as the largest terrestrial carnivore was challenged by two other theropods, *Carcharodontosaurus* from Africa and *Giganotosaurus* from South America. Both are known from just partial skeletons, so estimating their size is difficult.

A paper in the March 12 issue of *Journal of Vertebrate Paleontology* set out to determine the largest theropod. The authors looked at complete skeletons of 13 species of theropod, then calculated the correlation between the length of the skull and overall length of the skeleton, then estimated body weight. Species used ranged from the 3-foot-long *Compsognathus* to the 40-foot-long *Tyrannosaurus* and included such well-known forms as *Dilophosaurus*, *Coelophysis* and *Allosaurus*.

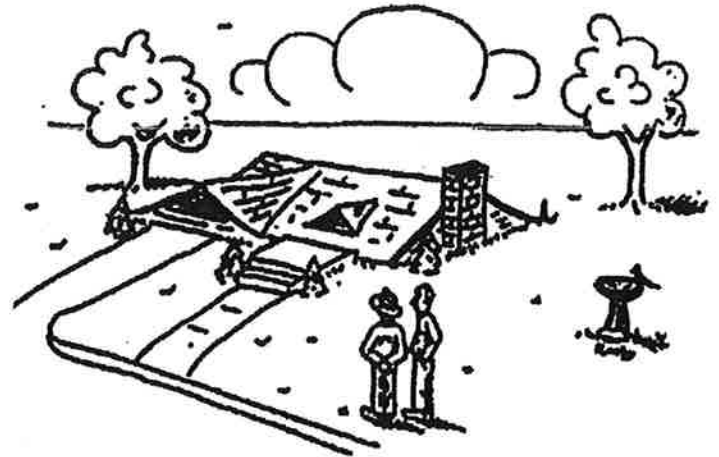
Two interesting patterns emerged. As the overall length increased, the skull size increased even more, so longer theropods had proportionally larger heads. Look at a *Tyrannosaurus* skeleton — even though the body is huge, the skull looks almost too big for its body. Also, as skull length increased, body weight increased even faster — the larger theropods were heavier, more rotund and had deeper bodies.

What about the challengers? Unfortunately, the known skulls of both *Carcharodontosaurus* and *Giganotosaurus* are incomplete. Small differences in how they are reconstructed scale up to large differences in estimated body length and weight.

Taking all that into account, the authors estimate that both contenders might have reached 43 feet. Another contender mentioned is *Spinosaurus*, also from Africa, which the recent article suggested might have reached 47 feet long.

Although long, *Spinosaurus* was relatively thin, so it weighed about the same as the others. All four of the largest known theropods might have weighed as much as 14 tons, and the authors suggest that that is the upper limit for a two-legged, land-dwelling animal.

Columbus Dispatch (May 8, 2007)



I Knew Ole Rocky Was Getting Too Many Rocks In His Basement!

by Rocky West in the *T-Town Rockbound*, (July, 1961)

THE GOODNESS OF CHOCOLATE

A good piece of chocolate has about 200 calories. As I enjoy about 2 servings per night and a few more on weekends, I consume 3,500 calories of chocolate in a week, which equals one pound of weight per week. Therefore, in the last three and a half years I have had a chocolate intake of about 180 pounds. I only weigh 165 pounds, so without chocolate, I would have wasted away to nothing about three months ago.

I owe my life to chocolate!

The Rockcollector (Nov., 2007)

A MEMBER OF THE CHALCEDONY FAMILY - ENHYDROS

Terminology That's All Wet

By Julian C. Gray, Member Georgia
Mineral Society

From Tips and Trips, Georgia Mineral
Society, 7/03

4th place, 2004 AFMS Advanced
Adult Articles

Mineral dealers at rock shows will occasionally offer specimens labeled enhydros for sale. What they are selling are typically quartz crystals with liquid inclusions. Within the liquid is a tiny bubble and if you tip the crystal back and forth the bubble will move. The dealers will often circle the bubbles and if you cannot find the bubble, the dealer will spend a lot of time searching with you. Most require that you use a magnifier. So what are these things?

First of all they are fluid inclusions, not enhydros, and they are also much more common than you might imagine. I will define both, but here is how fluid inclusions form. Minerals grow by adding elements to their surfaces, edges, and corners. Quartz crystals grow in many environments, but they commonly form by growth out of a hydrothermal solution—hot groundwater containing dissolved silica. Growth rates and mechanisms are complex subjects and some scientists spend years on this single area of research. It is enough for our purposes here to know that different parts of a single crystal or crystal face can grow at different rates. When this happens microscopic pits develop in the crystal faces. These become the vessels for our bubble-bearing liquid. Think of the hopper shaped halite or copper crystals that you've seen or those deep cavities or the faces of some Brazilian quartz. As the crystal grows larger, the next layer or several layers of crystal growth can cover these pits, trapping liquid in the process. Now the fun begins!

When a liquid is heated it expands, when it cools it contracts. Solids like quartz also expand and contract, but to a much smaller degree. An everyday example of expanding and contracting liquids is the liquid in a glass thermometer. The glass in a thermometer also expands and contracts, just not

nearly as much as the mercury or colored alcohol in the tube. When our quartz crystal is finished crystallizing it cools down (and so does the liquid in the inclusion). The cooling liquid contracts and may pull away from the sides of its tiny quartz container, forming a vapor bubble.

Scientists call these trapped liquids and their bubbles fluid inclusions. They are quite common and very fascinating. The white color of milky quartz is due to thousands or perhaps millions of microscopic fluid inclusions. Gemologists see inclusions when they look at certain gemstones (emerald is a good example) with a microscope. The liquid is not always water. A common fluid in ore forming processes is salty water. In general, hot water can dissolve a lot more salt than cold water can. Quartz growing in hot salty water may trap some of that salt water in inclusions. When the salt water in the inclusions cools and contracts, it too will form a bubble. But another interesting thing happens; because the water has cooled down it can no longer hold as much salt as it did when it was hot. Salt begins to crystallize out as a halite crystal within the fluid, which in turn is trapped in the quartz crystal. Imagine peering into a microscope and seeing an inclusion with a tiny vapor bubble and microscopic halite crystal! (micro-mounters eat your heart out.) Other things found in these fluid inclusions are carbon in fluids in Herkimer diamonds (doubly terminated quartz crystals from Herkimer, New York) and oil in fluorite from Elmwood, Tennessee. (Oil often fluoresces—check out your fluorite!) There are many more examples of wild stuff trapped in minerals (Roedder, 1972).

And let's think about this for a minute: the fluid in the inclusion is an actual sample of fluid in which the mineral was growing! For this reason fluid inclusions are geochemical time capsules for scientists. Techniques have been developed to study these inclusions and determine their composition and the exact means of trapping (Roedder, 1962 and 1984). They tell us how minerals grow, where deposits form, and even guide us to oil or metal deposits. They also add or detract from the value of gemstones. And they are simply entertaining to watch. I have a large inclusion in amethyst from the pegmatites in Brandenburg, Namibia. You can see the inclusion through a prism face of the amethyst

without a magnifier. The bubble will move around its triangular home in the amethyst when you rotate the crystal 360 degrees.

So what is an enhydros? The American Geological Institute's Glossary of Geological Terms (Bates and Jackson, 1987) defines enhydros as "a hollow nodule or geode of chalcedony containing water, sometimes in large amounts." This is different from the fluid inclusions that we have been talking about thus far. Remember that chalcedony is a micro-crystalline, fibrous variety of quartz. Chalcedony is made up of hundreds or thousands of tiny elongated quartz crystals. These fibrous crystals grow from groundwater flowing through a rock, commonly basalt or other volcanic rock. The silica-bearing groundwater begins precipitating quartz when it enters a cavity. The chalcedony may entirely fill the cavity, forming a nodule, or it may leave a void in the center to form a geode. If it forms a geode, then some of the remaining liquid may become trapped in the void. Everyone is familiar with geodes and we all know that the crystal-lined voids in the center can be several inches in diameter—they could hold a lot of water! Mineral dealers who sell true enhydros cut the water containing geode so that they miss the center of the geode, which would release the water. If you see an enhydros it will look like a chalcedony nodule, but if you shake the enhydros the water will move around.

Scientists call the quartz with moving bubbles fluid inclusions. That is what they are and that is what we should call them—fluid inclusions. Geodes with water are called enhydros. It would be better to call the things we see at gem shows "bubbles" than enhydros. Not a single article or book on fluid inclusions that I have seen even mentions the term enhydros.

There is a significant difference between enhydros and fluid inclusions. While enhydros may form by trapping water at the time they are formed, the walls of the geode are porous and water can leave or enter the enhydros. This happens in nature before we find and collect the enhydros. Groundwater may continue to flow in and out of the enhydros until we collect them, then water only seeps out. Some books warn that enhydros should be sealed to prevent leaking (not to worry, this process is very slow). This means that the water in the enhydros may not be the

same water that was trapped when the geode grew (Matsui et al., 1974). Fluid inclusions trap water from which the mineral grew. The walls of a fluid inclusion are solid and non-porous. Only under special, but not completely uncommon, circumstances will a fluid inclusion leak (Roedder, 1984). The water in the fluid inclusion is commonly the water that was trapped when the crystal grew. Some scientists have examples of fluid inclusion dating back to the early Precambrian. That's amazing. These Precambrian fluid inclusions may hold water that is over three billion years old!

Can fluid inclusions leak? Yes, but this happens only rarely and typically if a crystal is fractured at some point. Careful examination of the crystals with a microscope can reveal clues as to whether a fluid inclusion is primary and has not leaked. Minerals that exhibit cleavage are more susceptible to leakage: calcite, barite, and fluorite for instance.

Enhydros are scientific curiosities; fluid inclusions are a scientific research tool. It's sort of like the fluid equivalent of the difference between a rock and a mineral. It is incorrect to label a mineral with a fluid inclusion an enhydros. A label calling attention to the fact that a mineral bears fluid inclusion is correct and should even increase the value of a specimen because of the scientific value and unique circumstances under which these formed. Now get busy changing those labels!

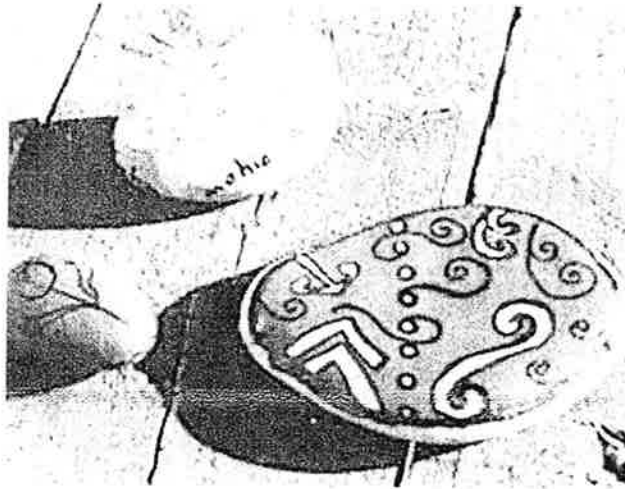
References:

- Bates, R.L., and Jackson, J.A., 1987, Glossary of Geological Terms— Third Edition: American Geological Institute, Alexandria, Virginia, 788 pp.
- Matsui, E., Salati, E., and Marinin, O., 1974, D/H and 180/160 Ratios in Water Contained in Geodes from the Basaltic Province of Rio Grande de Sul, Brazil: *Geological Society of America Bulletin*, Volume 85, pp. 577-580.
- Roedder, E., 1962 "Ancient Fluids in Crystals": *Scientific American*, Volume 207, pp. 38-47.

Junior Members' October Project

Led by Cordelia Tomasino

Time to put on the paint clothes again! We will be decorating palm-sized rocks worn smooth by the tides of the Pacific Ocean. Lots of paints, including many fall and holiday colors, will be available so come with ideas to make these rocks into works of art. Their size would be perfect for paperweights for gift-giving. There should be enough rocks for children to make at least two pieces of art.



Thank you! Great big thank-you's go out to Bob Miller and Jim Daly, for providing slate for last month's etching project, and to Kathy Miller, for providing the rocks for this month's project.

PAINT IT RED

To identify and grind out pits in a cabochon, spray the rough cab with red enamel from an aerosol can, then grind the paint off with a light touch. Pits and lines will stand out as bright red spots, making it unnecessary to wipe the cab to see if the pits are out. This is especially helpful when grinding free-form cabs from fire agate.

The Petrified Digest, (Nov./Dec., 2006)

