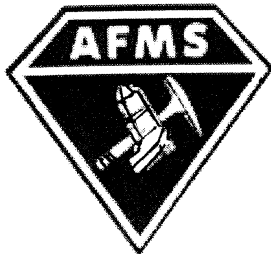


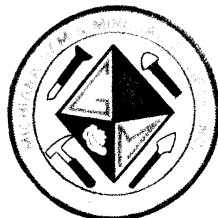
# **THE ROCKFINDER**

Michiana Gem & Mineral Society  
Tom Noe, Editor  
305 Napoleon St.  
South Bend, IN 46617



# **THE ROCKFINDER**

MARCH, 2010



# MICHIANA GEM & MINERAL SOCIETY

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The purpose of the Michiana Gem & Mineral Society is to promote the study and enjoyment of the earth sciences and the lapidary arts, and to share lapidary knowledge and techniques.

General meetings are usually held the fourth Sunday of each month, 2:00 p.m., at Our Redeemer Lutheran Church, 805 S. 29th St., South Bend, IN. Regular exceptions include May (third Sunday), July (no meeting), August (club picnic) and the November/December meeting and Christmas party. Board meetings are held before the monthly meetings. The annual club show is in late August.

✂-----  
 Yearly Membership Dues (Payable by December 15)  
 \_\_\_\_\_ Individual \$15.00 per year  
 \_\_\_\_\_ Family \$20.00 per year  
 \_\_\_\_\_ Junior \$1.00 per year  
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Michiana Gem and Mineral Society ([www.sauktown.com/Michiana](http://www.sauktown.com/Michiana)), a not-for-profit organization, is affiliated with the Midwest Federation of Mineralogical Societies ([www.amfed.org/midwest.htm](http://www.amfed.org/midwest.htm)) and with the American Federation of Mineralogical Societies ([www.amfed.org](http://www.amfed.org)).

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Permission is hereby granted to reprint any original *Rockfinder* articles, as long as recognition is given along with the reprint.

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 With my signature I hereby release the Michiana Gem and Mineral Society, Inc., and its individual members and the owners of any premises upon which I enter under permit granted to the society, absolutely free of any liability whatsoever, to my person or my property, and further I will respect the equipment and property of the aforesaid owners.

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# THE ROCKFINDER

Newsletter of the Michiana Gem and Mineral Society

Volume 50, Number 3

March, 2010

**Next meeting:** March 28

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:** The junior members will present a varied program showcasing their interests in the earth sciences. Presentations may include Powerpoints, educational displays and specimens.

The April program will be a silent auction.

**Refreshments:** Susan Brown, Florie Schuler and Lana Wright.

Thanks to Annette Freel and Sherry Kobie, who have volunteered to organize the refreshments each month. And a huge THANK YOU of appreciation to Tom and Pat McLoughlin for serving in this way for many years! Thanks!



***Michiana Gem & Mineral Society events:***

**April 24:** MGMS Field trip to Alabastine Mine near Grand Rapids.

**July 18:** MGMS Annual Picnic, Potawatomi Park.

**August 27-29:** Annual MGMS show at the fairgrounds.

**September 17-19:** MGMS bus field trip to southern Ohio for fossil collecting.

***Other area events:***

**MARCH**

20-21: Cedar Valley Rocks & Minerals Society Show; Teamsters Hall, Cedar Rapids, IA.

**APRIL**

3-4: Lincoln Gem & Mineral Club Show; Lancaster Event Center.

10-11: Southern Illinois Earth Science Club's Annual Show; Marion, IL.

10-11: Green Bay, WI. Geology Club's Show; Neville Public Museum.

16-18: Mt. Clemens Gem & Lapidary Society Show; Roseville, MI, Recreation Ctr.

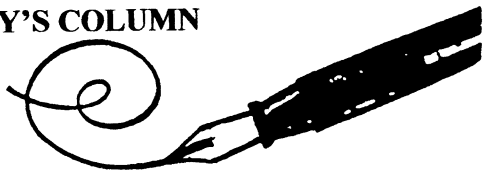
17-18: Columbus, OH. Columbus Rock & Mineral Society Show; Veterans Memorial.

17-18: Eau Claire, WI. Chippewa Valley Show; Eau Claire County Expo Center.

23-25: Decatur, IL. Central Illinois Gem & Mineral Club Show; Macon County Fair Grounds.

24-25: St. Joseph, MI. Blossomland Gem and Mineral Society Swap 'n' Sell; St. Joseph/Lincoln Senior Center, Sat. and Sun. 10-4.

30-May 2: Kalamazoo, MI. Kalamazoo Geological and Mineral Society; Kalamazoo Expo Center, 2900 Lake Street; Fri. 4-8, Sat. 10-6, Sun. 10-5.

**KATHY'S COLUMN**

I wasn't really sure what to write about this month, so I went outside to appreciate our first warm sunny days. I looked at the snow finally melting from our garden rocks, and I was enjoying their various colors and remembering what part of the US they were collected from. I also saw hyacinth and tulip sprouts and remembered Sally Peltz and my son Todd telling me their crocuses were coming up. Fresh air, signs of spring—okay, I am ready to write.

The January and February meetings have had wonderful attendance, it is so nice that the club is growing in numbers. Our club is reaching out to the surrounding communities, and they are hearing about us and coming to see what the Michiana Gem & Mineral Society is all about.

Sincerely, I know this is because of you folks, the members, who have extended your warmth, fellowship, knowledge (and good food) to all our visitors and new members. They have found there are not any cliquish groups in our club, everyone is a friend--true rockhounds!

I also appreciate all the MGM members who are able to bring in a display for the meetings. We all enjoy seeing what part of the hobby you are interested in. For the March, April and May meetings, those of you who went to the Field Museum or the Alabastine gypsum mine field trips may have something you wish to share.

It is so nice to have members like Jim Daly, John Davis and Jason Hefner step forward in taking the lead and helping out with field trips.

**Two Reminders**

Now that our Show Chair Marie Crull and Show Dealer Chair Joe Perry have the annual show dates confirmed for August 27, 28 and 29, I hope you will start planning now to display some of what you have collected to share in an exhibit at the show. Juniors, don't be shy about displaying your collections!

Diane Gram is getting close to finalizing

the club's Recipe Book. We even had one long-time homebound member, Tess Miller, send in recipes! Diane has been working on this and our club directories, so both will be ready soon. Thank you, Diane!

That's it, I'll see you at the March 28 meeting.  
Rock on,  
Kathy

**FIELD TRIP REPORT****Bus Trip to Southern Ohio in September**

I will be in contact with the Manchester Inn before our March meeting to set prices for the private-room buffet on Saturday night. I hope to have info for you at the meeting. I wanted to give our hard-working Treasurer, Marty Perry, a break from all the finances she had to deal with concerning the Field Museum and dues. Start saving your pennies, nickels, dimes and quarters! :)

Kathy

**MINUTES OF THE MARCH MEETING**

Call to Order – Vice-President David Peltz called the meeting to order at 2:05. In attendance were 45 adult members, 13 guests and 8 children. David led the Pledge of Allegiance.

Welcome – President Kathy Miller welcomed past club presidents, guests and new members.

Secretary report – Jason Hefner. Tom Noe motioned that the minutes from the January meeting be accepted as published. Motion seconded and carried.

Treasurer report – Marty Perry. Club financials were reported and will be filed for audit.

Liaison reports – Sue Brown, Midwest Federation State Director. Sue indicated that there was no news to report. Bob Miller – American Federation President-Elect. Bob indicated that there was no news to report.

Before Kathy Miller left to help with the children, she passed around a sign-up sheet looking for one or two volunteers per meeting to help with

the juniors' activities. Jessie Zeiger went with her to help for February.

David Peltz called for committee reports.

Editor report – Tom Noe. Tom requested that members send in original articles for *The Rockfinder*. Tom had a few extra *Rockfinders* to give out

Education report – Jessie Zeiger. No report, due to Jessie volunteering to help with the Juniors.

Field Trip report – David Peltz for Kathy Miller. John Davis will be contacting several locations in Ohio in the next month to set up some fossil-collecting day trips for interested members. Jim Daly asked for people to finish the sign-up sheet for the Alabastine Mine trip in April. If you are going, remember: hard hats are required as well as two light sources with extra batteries for each, as well as a change of shoes to keep the paved portions of the mine clean. Recommended are rubber boots and extra socks. Jason Hefner passed out flyers for the Ben E. Clement Mineral Museum 2010 fluorite digs. See [www.clementmineralmuseum.org](http://www.clementmineralmuseum.org) for more details.

Historian report – Ed Miller. Ed suggested the club head to southern Indiana for a geode trip.

Hospitality report – Annette Freel & Sherry Kobie. Annette and Sherry hosted their inaugural snack & beverages. Everyone enjoyed themselves very much.

Juniors report – Diane Gram for Cordelia Tomasino. Diane read Cordelia's report that will be in the *Rockfinder*. Cordelia would like 2 or 3 members to speak to the juniors at March's meeting regarding careers in earth sciences.

Librarian report – Pat Bell. Nothing to report.

Membership Report – Marty Perry. Nothing to report.

Programs / Displays – David Peltz. The next meeting will have a program presented by the junior members. The program for April's meeting will be a silent auction.

Publicity – Joe Perry. Nothing to report.

Show – Joe Perry. The club show is set for August 27 through 29. Four dealers have registered so far.

Sunshine – Sally Peltz. Nothing to report.

Webmaster – Jim Daly. Nothing to report.

Old Business – Still need recipes for our

club cookbook. These have to be in by the March meeting so we can sell our cookbooks at the club show in August. It was reported that Don Szczydrowski and Mike Skoczylas manned the club's table at the Science Alive exhibit on February 6 and that the event was well attended. The club is still researching if we can have a table at the County 4H Fair this year. The club picnic will be at the same location as last year on July 18.

New Business – Remember to sign up to help with the juniors for one meeting. February 28 was the last day to sign up for the Field Museum trip.

Door Prizes – Don Church gave out door prizes to one adult (Celia Harrington, a guest) and one junior (Alexis Miller). Don also asked if members want to donate a nice door prize to please see him.

Program – Bob Miller gave a very informative program regarding Apache tears and where to collect them. (Road trip, anyone?) Thanks for the information, Bob.

Adjournment – Don Church made a motion to adjourn, which was seconded by several members. Motion carried and meeting was adjourned. Snacks were enjoyed by all.

## **OBSIDIAN TELLS TIME**

Time (in age) can be measured with obsidian. It is emerging as a promising tool for dating and tracing prehistoric culture. What makes it useful for dating is that it continuously absorbs moisture from the air. The moisture penetrates the stone at a constant rate and leaves a telltale mark on the obsidian, which is visible under a microscope. By examining the watermarks, the age of a piece of obsidian can be calculated with extreme accuracy. This is valuable because the measurements can be extended half a million years into the past, well beyond the 40,000 year limit of carbon dating. A most important use of obsidian is in dating glacial periods in the United States. Stones that were carried along by advancing ice have confirmed that a major ice age began 180,000 years ago, and their final (most recent) retreat came around 12,000 years ago.

*Show-Me Rockhounds* (Apr., 2009)

INDIAN MOUNDS ROCK & MINERAL CLUB  
ARROWHEAD NEWS

November, 2009

**HONEY GYPSUM FROM THE ALABASTINE MINE***by Kreigh Tomaszewski*

It was almost 50 years ago when I first visited the Alabastine Mine (Michigan Natural Storage Co.). I was in awe to actually be in an underground mine. I had a small rock collection, and had joined the Grand Rapids Mineral Society; my Dad took me to the monthly meetings at the Museum since I was not yet 10. This report is a tribute to the support my parents gave me in my early interest in rockhounding.

Some years later I started work on my first Boy Scout Merit Badge, Geology, as I worked towards becoming an Eagle Scout. I had to write a geology report and I did it on the Alabastine Mine, documenting its history and some of the geology. The owners were most helpful. I was able to independently obtain a survey map of the mine.

Years went by and I got to take school classrooms, and other groups of kids, into the mine as an adult chaperone. Then the mine was sold and access stopped. I used up all of the honey colored gypsum I had been trading for decades. Another collecting location lost.

During all these years everyone had always told me that the honey color of some of the gypsum (selenite) from the Alabastine was due to a salt (halite) impurity. Most of the mine has beautiful white alabaster, selenite (including a unique pencil variety), and some satin spar, gypsum. But there are areas where the gypsum is a beautiful, rich, dark, honey color. It was always worth collecting because it makes some of the most attractive specimens.

And then magic happened. A local college professor at GVSU obtained access to the lost mine locality and I got to go collecting again (in the middle of the winter!) after more than a decade. And a few months later I got to lead a field trip to the mine with six hours of unlimited access. My lost friend had returned.

But my rockhounding has matured from just pretty to the science hidden in the specimens. What was the real reason for the orange/red honey color of the best gypsum from the Alabastine? Was a halite impurity an adequate explanation? It was time to find out.

My matured rockhounding experience also found some affordable lab access, and I sent a sample off to a friendly college Professor (with a nominal donation to the college's geology scholarship fund)

*I ran an XRD on the orange gypsum today. I didn't see any peaks (no halite) other than gypsum peaks for the orange material. I'm not sure what the pigment is, though it wouldn't surprise me if it was a trace of very fine FeOO (goethite, lepidocrocite) or hematite. The green clayey material is dominantly quartz with a mica-like clay, possibly celadonite or glauconite, considering the green color.*

OK, it is time to throw away at least 50 years of accepted local lore. It is not halite causing the color. Now it is time to find the real cause of the honey coloration. I get to do some real science and discover something new.

Checking with a few local geology professors produced a consensus opinion of Potassium, but none could cite any published research. Local lore again. I tapped a friend at the USGS and did a search of the literature. Found some very interesting articles on Michigan Formation gypsum, but nothing to explain the color. Same results from a couple geology professors I asked.

It is time for brute force when XRD does not make a conclusive identification. Back to the lab for a Mass Spec (my first). It won't identify any minerals, but knowing what elements are present will be a big help. It doesn't hurt to get a friendly Geology Professor interested in a good question.

*I think the color in the gypsum is due to iron oxides. The ICPMS analyses suggest that there's about 0.01 wt% K, 0.18 wt % Na, and 0.37 wt % Fe in the gypsum, with other candidate elements being well below those levels. The orange-red is typical of iron oxide pigments, too. I suspect the Na and K are mostly present as chlorides in inclusions of the brine the gypsum precipitated from.*

*For the analysis, I dissolved 0.0131g of red gypsum in 18M-ohm water and 1 mL of sub-boiling double-distilled HNO<sub>3</sub> and diluted to 100.08g of solution (1 mL conc. HNO<sub>3</sub>, balance = water, all ultra high purity). The analysis was done on a Varian UltraMass 600 ICPMS, with the following analytes set (this analysis was tagged onto*

*the end of another analysis I was doing to identify a steel alloy): Be, Na, Mg, Al, K, Ca, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Mo, Cd, Sn, and W.*

*Under the microscope, I could see the red coloring is not even—it is somewhat mottled, but does not follow growth zones that I could see. And the Fe oxide pigment particles are too small to resolve optically (I'm using a Nikon Optiphot-pol research-grade polarized light microscope) even with a 100X oil immersion objective lens, so the particles are well under 0.05µm.*

*I suppose the particles might be detected using scanning or transmission electron microscopy.*

The lab work is not done (I want positive results instead of a process of elimination), but I think it is time to share preliminary results that seem to be conclusive. It is not Sodium. It is not Potassium. It is Iron that makes the beautiful honey colored gypsum from the Alabastine mine.

The field work is not done either. My impression is that the honey coloration in the Alabastine seems to reflect a pond and stream topology in the gypsum beds, with the iron being introduced in the flowing/ponding water. I want to confirm this by mapping the honey color in the mine onto the survey map.

More research is needed. I hope I can get enough mine access to complete it.

***Federation Conventions and Shows:***

American (& California) Federation, June 18-20, La Habre, CA

Midwest Federation, August 27-9, Peoria, IL.

Northwest Federation, September 17-20, Hillsboro, OR.

Rocky Mountain Federation, April 23-5, Wichita, KS.

South Central Federation, December 11-2, DeRidder, LA.

**A FEW GROANERS FOR APRIL FOOL'S DAY**

I wondered why the baseball was getting bigger. Then it hit me.

Police were called to a daycare where a three-year-old was resisting a rest.

Did you hear about the guy whose whole left side was cut off? He's all right now.

The roundest knight at King Arthur's round table was Sir Cumference.

To write with a broken pencil is pointless.

When fish are in schools they sometimes take debate.

The short fortune teller who escaped from prison was a small medium at large.

A thief who stole a calendar got twelve months.

A thief fell and broke his leg in wet cement. He became a hardened criminal.

Thieves who steal corn from a garden could be charged with stalking.

**FEELING MINERALS**

By Bill Cordua, U. of Wisconsin - River Falls

Most of us are sight-oriented when we study rocks and minerals. Once, though, I was asked to give a program on minerals for the Minnesota Society for the Blind. As I was preparing this, I was impressed by the number of properties minerals have that can be sensed with the hands. It's worthwhile reviewing some of these, as they are good identification tools for anyone.

Density (or specific gravity) is one of the more familiar ones. This is the mass per volume. As an example, think of suitcases. They have a certain volume. When they are empty, they have little mass, thus a low density. Put clothes in them and they get heavier for their volume. If you're a typical rock collector, you have probably put rocks in your suitcases and increased their density immensely, much to the annoyance of airport luggage handlers. Mineral densities can be evaluated the same way - by "hefting" them. If they have a medium density, they will feel about normal in mass for their size. If they are low density, like pumice or muscovite, they will feel light. If they are higher density, like garnet, galena, copper, barite or magnetite, they will feel heavy for their size. There are, of course, many ways to measure this density precisely, but "the heft test" still is a useful field test requiring no expensive instruments. You can fine-tune your approach by practicing hefting known minerals.

Another property that can be appreciated with the hand is tenacity - the resistance of a mineral to mechanical crushing or bending. Brittle materials will break when stressed. Most minerals are brittle. Malleable minerals, such as copper or gold can be flattened into sheets. Those who collect on the old copper mines in Michigan's Keweenaw Peninsula are aware of the resistance of copper-bearing rocks, and the spiny feel of the broken copper edges. These minerals are also ductile, meaning that they can be drawn out in the form of a wire. Some minerals like chalcocite or gypsum are sectile, meaning they can be cut with a knife. Gypsum is soft enough to be cut by a fingernail. Some minerals, like the micas, are elastic and can return to their original shape after being bent. Some minerals like talc are flexible. Once bent, these minerals stay bent after the pressure is released.

The smoothness or slipperiness of a mineral's surface can also be used as a tool. Talc feels slippery. Serpentine feels greasy. The fibrous character of splintery or asbestiform minerals can also be sensed.

Other minerals have distinct surface properties related to their wettability. This has to do with the way particular atoms on the surface of a mineral interact with water or other materials. Chrysocolla becomes sticky when moist, as do many clay minerals. Some clay minerals, such as those in the smectite group, actually swell when they absorb water and lose their strength. This is one reason why so many Western roads (where smectites are common in the soils) are good when dry, but become slippery mud holes after a rain. Diamonds do not wet with water. If a pile of crushed minerals is saturated with water to become a slurry, then run over a grease (such as Vaseline) the uncoated diamonds will stick to the grease while the well-wetted gangue minerals will slide right by. Beryl, corundum, rutile, spinel, topaz and zircon are other minerals that wet with difficulty. The capacity of dirt to slide off of mineral surfaces also affects their cleaning. People who remark to me that datolites can be recognized on the mines dumps of the Keweenaw by the way the dirt seems to slide off of them are using this property.

Minerals are great to look at, but the enjoyment of their properties span all the senses.

**References:**

Frye, Keith, 1993, *Mineral Science, An Introductory Survey*, MacMillan Pub., 360 p.  
Hurlbut, C. S. and W. E. Sharp, 1998, *Dana's Minerals and How to Study Them*, 4th Ed., John Wiley and Sons Pub., 328 p.

**CAMPING HINTS**

When using a public campground, a tuba placed on your picnic table will keep the campsites on either side vacant.

Lint from your navel makes a handy fire starter. Warning: remove lint from navel before applying match.

*T-Town Rockhound* (May, 2009)



## **FINDING ROCK HUNTING MAPS ON THE INTERNET**

By Glen Miller

Here are some tips for locating free online maps (primarily USA). The good news is that there is a federal program that publishes digital products online that will provide complete national coverage. The bad news is that it is a federal program, subject to manpower and funding constraints, but it is a very good start. The Internet is a source for many maps of other countries. I have viewed geological maps of Oman and even the Moon and Mars online.

Geological and Geophysical Maps - Finding the map you need: Traditionally, one went to a state bookstore to purchase a paper map, hoping it was still in print. The trend today is to publish them online with free access. Tennessee will no longer be printing maps in advance. Maps that aren't online can be purchased for \$20 a map, printed straight from a digital file.

About.com = the quick and easy solution for links to state geological maps. About.com presearches and assembles all types and classes of information. If you go to their Geology or Maps sections and poke around, there are pages for state geological maps and state geological organizations. There is also <geology.com> with similar sources. They also list state authorities and links to their websites. Once in those websites, you may frequently find a free downloadable map for the local area you are looking for. The USGS has taken great steps to centralize the search for geological maps.

*CIMS Newsletter (Feb., 2008)*

## **DINOSAURS - WHAT IS LEARNED FROM THEIR TRACKS**

By Dee Grover

The tracks of dinosaurs, when associated directly with bones, can exhibit a very large bank of information about the animal that made the tracks. This is especially true if there is a series of tracks that displays a walk, a jog or running activity.

One example that tells us a fascinating tale is located 23 miles north of Moab, Utah. Following the

directions provided by BIM to the parking area, we walked up a small hill and looked down into what appeared to be a dry streambed that was topped by a slate-looking rock. Imprinted in the rock were 14 or 15 very deep tracks that were probably made by a huge four-footed dinosaur said by paleontologists to be an Apatosaurus. After about four steps the Apatosaurus suddenly made a 90 degree turn, and his prints disappeared under the banks of the streambed. A turn of this magnitude is highly irregular for an animal of this size. Closer examination of the site reveals a very large theropod track which was made by an Allosaurus. The track was aimed at the left shoulder of the Apatosaurus at the point where the 90 degree turn was made. I surmised that was the last step taken by the Allosaurus, as he jumped upon the back of the Apatosaurus and had "Baby (giant) Rib Rack" for lunch.

Areas that are completely trampled with hundreds of dinosaur tracks are described as having "dinturbation." This proves that some dinosaurs lived in packs. Evidence based mainly on tracks, also backed by bones, shows homed dinosaurs such as Triceratops, Ankylosaurus, and Protoceratops were gregarious, as were herbivorous dinosaurs such as Brontosaurus, Iguanotids, and types of duckbills.

Some track measurements can give ballpark figures of length, height, size and speed of the maker of the tracks. The length of the foot times four equals hip height for smaller dinosaurs, and times five and one-half for larger ones. Length of stride can indicate speed of the animal, provided the bone of the leg is known. If a step is shorter than four feet while walking and more than four feet while running the speed will be 5-10 kilometers per hour. The distance of the midpoints of the manus (front) and pes (back) foot strides equals the hip-to-shoulder measurement and gives a good estimate of the size of animal.

Some slender, long-legged dinosaurs such as Coelophysis could probably attain speeds of 40-45 kilometers per hour. Huge dinosaurs such as Titanosaurus could probably only move 5 kilometers per hour as he shook the earth in his walk. Speed can be judged by the angulation (angular deflection of the foot from the center line of both feet as they move) of the tracks and the length of the steps and strides. Studying modern animals has helped in this study.

## March Junior Rockhounds' Page

### EARTH SCIENCE FAIR — THIS MONTH

Juniors, show off your rocks, minerals, fossils, earth science projects and lapidary handiwork to the whole club this month. We're the program! Let the adults know what you really like about rocks.



Every junior is encouraged to set up a display—be it a PowerPoint presentation on a laptop computer, jewelry you've made, your favorite rocks from your collection, or an educational display. No junior is too young, and no display is too small.

Adults, visit the displays and get to know the kids and their passions. Encourage them this month to really get into this hobby. A few kind words today may be the spark a junior needs to keep with rockhounding for a lifetime.

During the business meeting prior to the program, the juniors will be learning about careers in the earth sciences and lapidary arts. In particular, we'll hear from club member Rev. Larry Calhoun about turning his love of rocks into a business.

You don't have to wait until you're grown to start a business—check out how Jessica Chekal, a girl from Livonia, MI, started Dragon Mountain Treasures, a business specializing in rock and mineral kits for kids. Her story and rock shop is at: [www.rockhoundkids.com](http://www.rockhoundkids.com).

### BADGE PROGRAM

All junior members are eligible to join the Future Rockhounds of America (FRA) badge program sponsored by the American Federation of Mineralogical Societies and our local club. The program consists of an FRA membership patch, 15 badges (Rocks & Minerals, Earth Resources, Fossils, Lapidary Arts, Collecting, Showmanship, Communication, Field Trips, Leadership, Earth Processes, Earth in Space, Gemstone Lore & Legend, Stone Age Tools & Art, Gold Panning & Prospecting, and Rocking on the Computer), and a Rockhound Badge for kids who earn 6 of the 15 badges. A 155-page guidebook describes and outlines requirements for each of the 15 badges. There are 85 activities to choose from, or about a half-dozen activities per badge, with kids required to complete only 3 activities to earn any particular badge.

We have two groups of juniors that meet together for badge work:

—Michiana Jr. Rockhounds meet during the business meeting portion of the monthly club meeting.

—JEWELS, an after-school group, composed mainly of homeschoolers, meet once or twice a month.

**\*\*But you don't have to wait for meetings—take a look at the guidebook available on the AFMS web site ([http://www.amfed.org/fra/fra\\_badge.htm](http://www.amfed.org/fra/fra_badge.htm)) and start working on projects at home. As Juniors' Coordinator, I just need to see your completed projects or have your parents let me know that you have completed them . . . and then I can order your badge.**

—Cordelia Tomasino, Juniors' Coordinator, [tomasinos4@juno.com](mailto:tomasinos4@juno.com), or (269) 684-3454.