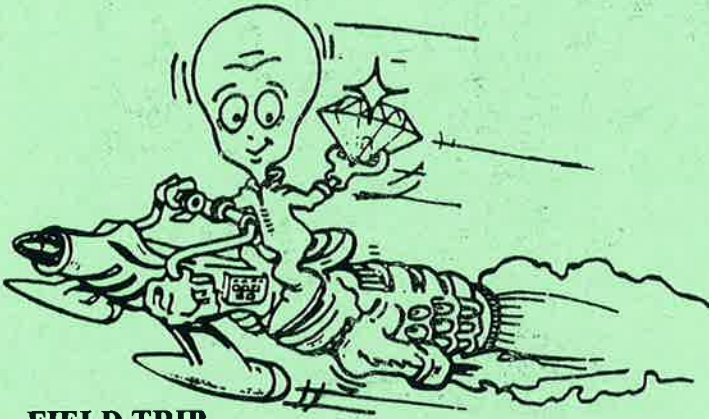


The Rockfinder

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



**FIELD TRIP**

Stoneco Quarry  
June 8 - Drive Up



MAY, 1996

# THE ROCKFINDER

**HIGHLIGHTS IN THIS ISSUE:**

Club Field Trips Scheduled, p.3

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Tyrannosaur Skin Impressions, p. 8

**MICHIANA GEM & MINERAL SOCIETY**  
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THE PURPOSE of the Michiana Gem & Mineral Society is to promote interest in and study of the earth sciences and the lapidary arts, and the sharing of knowledge and techniques.

General meetings are held the fourth Sunday of each month, 2:00 pm EST, at Our Redeemer Lutheran Church, 805 S. 29th St., South Bend, IN. Exceptions include field trip meetings, June (field trip), July (no meeting), August (club picnic) and December (Christmas Party).

Board meetings are held the second Wednesday of each month, 7:00 pm, St. Joseph County Public Library, basement level.

The annual club show is Labor Day Weekend.

The Michiana Gem & Mineral Society, a not-for-profit organization, is affiliated with the Midwest Federation of Mineralogical Societies and with the American Federation of Mineralogical Societies.

*Rockfinder* staff:

Editor, Tom Noe, 305 Napoleon Blvd., South Bend, IN 46617  
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Reporters, Bob Heinek, Herb Luckert, club members  
All contributions for publication should be in the hands of the editor by the 10th of each month. Call (219) 289-2028 or (219) 654-3673. Permission is hereby granted to reprint any original *Rockfinder* articles, as long as due recognition is given along with the reprint.

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Yearly Membership Dues (Payable before January 1)

|                  |                  |
|------------------|------------------|
| _____ Individual | \$ 6.50 per year |
| _____ Family     | \$10.00 per year |
| _____ Junior     | \$ 2.00 per year |

Please send your dues and this form to  
Michiana Gem & Mineral Society  
c/o Margaret Heinek  
7091 E. East Park Lane, New Carlisle, IN 46552-9400

Please make address corrections to the mailing label (reverse side) and/or fill in the optional information below.

Check your SPECIAL INTERESTS:

List Family Members (spouse and children):

- General Geology \_\_\_\_\_ Beads \_\_\_\_\_  
Gems & Minerals \_\_\_\_\_ Silversmithing \_\_\_\_\_  
Fossils \_\_\_\_\_ Artifacts \_\_\_\_\_  
Cabochons \_\_\_\_\_ Rockhound \_\_\_\_\_  
Faceting \_\_\_\_\_ Crystals \_\_\_\_\_  
Carving \_\_\_\_\_ Micromounts \_\_\_\_\_  
Other \_\_\_\_\_

- Name \_\_\_\_\_ Birth Mo/Date \_\_\_\_\_  
will attend meetings, yes \_\_\_ no \_\_\_  
Name \_\_\_\_\_ Birth Mo/Date \_\_\_\_\_  
will attend meetings, yes \_\_\_ no \_\_\_  
Name \_\_\_\_\_ Birth Mo/Date \_\_\_\_\_  
will attend meetings, yes \_\_\_ no \_\_\_  
Name \_\_\_\_\_ Birth Mo/Date \_\_\_\_\_  
will attend meetings, yes \_\_\_ no \_\_\_

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# THE ROCKFINDER

Volume 36  
Number 5

MAY, 1996

Published by  
Michiana Gem & Mineral Society

**Meeting:** Meeting: Sunday, May 19  
Doors Open 1:30 PM  
Meeting at 2:00 PM

May program: Bob and Kathy Miller will talk about their trip to Israel.

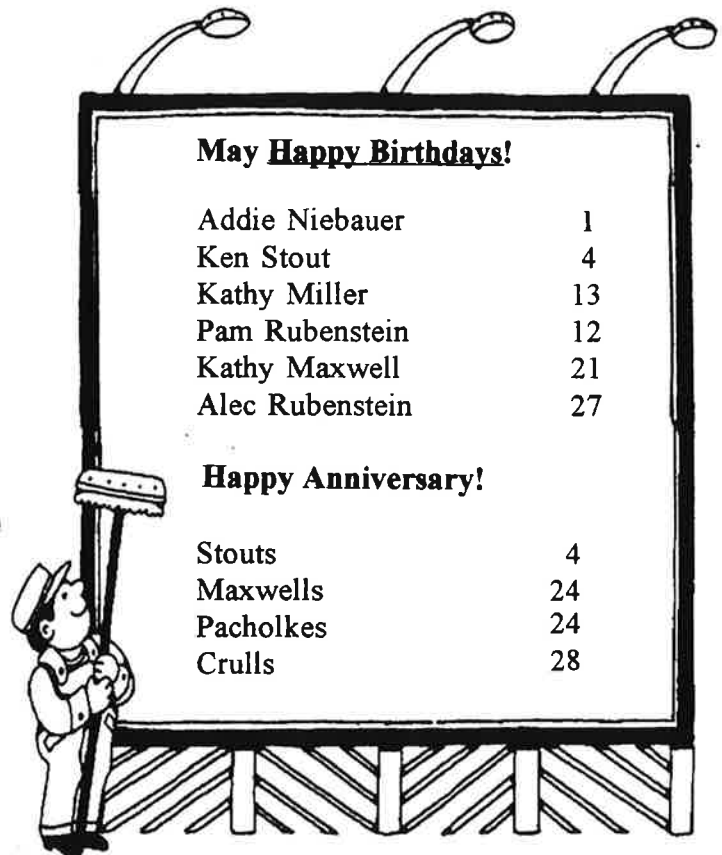
**Place:** Our Redeemer Lutheran Church  
805 S 29th St. (29th & Wall)  
South Bend, IN

**Hosts** Pam Rubenstein &  
Joseph & Janet O'Tousa



## UP AND COMING

- May 24-26: North American Promotions Gem and Jewelry Show, Wright State University, Fairborn, OH.  
May 25-27: Chicagoland Gems & Minerals Assoc. Show, DuPage County Fairgrounds, Wheaton, IL  
May 31-June 2: North American Promotions Gem and Jewelry Show, Masonic Complex, Toledo, OH.  
June 8: Club field trip to Stoneco Quarry  
June 21-23: Gem-Mineral-Fossil Swap!, Lawrence County Rock Club at Monroe County 4-H Fairgrounds in Bloomington, IN.  
July 26-28: Annual Midwest Federation Convention and Show in Macomb, IL.  
August 5-9: Red Metal Retreat, Houghton, MI. Lake superior Copper Mining District of Michigan's Upper Peninsula, geological tour, mineral swap collecting field trips, slide talks, and a benefit auction.  
August 9-11: American Federation's Convention and Show in Riverside, CA.



MARGARET'S COLUMN

Summer is coming up on us soon, and everyone will be busy, what with vacations and shows. The first one will be the Memorial Day show in Wheaton, IL. This has always been a very good show, and I am sure if you attend you will see some good dealers and displays. Our meeting will be one week earlier (May 19th) than usual due to Memorial Day, so plan on a trip to Wheaton.

The next event will be the MWF Convention that will be held in Macomb, Western Illinois University, July 26-28, 1996. Bob Miller will be elected as the MWF President, and we would like to make sure we support him. Want any information? Let us know and we will see that you have information.

The next show, the AFMS/California Federation Combined Show, will be held in Riverside, Calif. on Aug 9-11. Bob and Kathy Miller, Bob and I will attend. Bob Miller, representing the MWF as V-President, and I will be there as in-coming President of the AFMS.

We are planning our August Picnic and will announce the date later. Marie Crull will call the Park and see if we are able to have the picnic on August 25th, and if not, August 11. More on this later. We are also wondering if we should change the dates for the picnic for next year. Please make your thoughts known.

Then, the Michiana's Annual show here in South Bend, on Aug. 30th through Sept. 1. This is the important one!!! We need displays, workers and more help in draping the tables. If you plan on going on the Sept. field trip, you must put time in at the show, either in the preparation, set-up or at the show. Remember, we need displays, and we would like a volunteer to chair this committee.

The job will be to contact members for displays, and have a committee to set up the displays. So PLEASE call me and volunteer! Tom Noe, who will set up and run the Silent Auction, will also need help. He will explain what he will have on the auction, and if you can sell some of your items. The silent auction at the club's fall show will raise money for the bus trip in September, as did the auction run by Tom at the South Bend Show in April (almost \$300.00!).

Our week-end Ohio trip will be September 27, 28 and 29th, and Kathy tells me the bus is full, as well as the motel. If you have made reservations for this, and find you are unable to go, by all means, let Kathy know, so she can fill the bus and motel rooms.

Lots of things to think about in the next few weeks, so put on your "thinking cap" and see what we come up with.

Bob and I have finally decided to try to work on the On-Line in the computer. We are so new a it, I sent Herb Luckert an E-Mail and it came to me with Herb getting the carbon copy! We had a good laugh over this. It is fun to think we can communicate with someone miles away instantly.

See you at the next meeting, May 19th. I understand Kathy and Bob Miller will show some of their pictures they took in Israel.

---

### **Fossil Preservation Bill Update**

Currently H.R. 2943 is stumbling through committee and being discussed by our legislators. Opposition to the bill is coming from one professional society of paleontologists, despite overwhelming support from other scientists and amateurs. If you haven't yet contacted Tim Roemer for a copy of the bill, all you have to do is call his office. Be sure to let your representatives know your opinions on this bill. This is a landmark piece of legislation.

## IMPORTANT INFORMATION FOR JUNE 8 FIELD TRIP

By Kathy Miller, field trip-chair

All club members are invited to join with members of the Three Rivers Gem and Mineral Society (Fort Wayne) for a collecting trip to Stoneco Quarry, a few miles southwest of Fort Wayne. You will need to provide your own transportation, tools, food, etc. The quarry owners are allowing us to collect during the operating hours of the quarry, from 7:30 AM to noon on Saturday, June 8. So, we need to be considerate as possible, basically just stay out of their hair while we're collecting.

Yes, 7:30 AM is VERY early, but it allows us four and a half hours of collecting, and less chance of sunburn. The company started blasting in April, which may give us fresh material to find.

The quarry is noted for its iridescent pyrite crystals, and also contains marcasite, fluorite, calcite, sphalerite and marine fossils. It is difficult to get good fossils because of the hardness of the matrix, but persistence could be rewarded. There should be plenty of crystals of various sorts.

Refer to the following map to locate the quarry, marked with an X inside a circle. The best route appears to be Hwy. 30 to Interstate 69 south (also Hwy. 24 at this point), then following Hwy. 24 as it exits Interstate 69. Look for a Wendy's restaurant at this exit. (Some of the lines on the map are roads and other are not.) Follow Ellison Road south, then cross under the interstate and find Yohne Road going east. Then the quarry should be on your right, across the road from Fox Island Park. If you get lost ask somebody for help. If you reach Ohio, you have gone too far.

This is a great chance to meet some fellow rockhounds from the Fort Wayne area and also to collect some nice crystals. Several other activities have been suggested for the afternoon, so those who want to stay longer can decide at the time what to do.

### REMEMBER TO BRING:

- 1) sack lunch (or eat at Wendy's nearby)
- 2) snacks (optional)
- 3) something to drink
- 4) rock equipment:  
collecting bag



- hammer-chisel-hand rake
- hard hat
- glasses or goggles
- sledge
- 5) extra pair of shoes
- 6) gloves
- 7) water to clean with
- 8) paper towels
- 9) loupe or magnifying glass



When you collect, think of our September show. We need material for the Kids' Korner and the Silent Auction.

Come and have fun! Collecting is one of the main features of our earth science hobby.

## CLUB FIELD TRIP TO HUESTON WOODS September 27-29

The bus is full! Anyone who wishes to be put on the cancellation list, please leave your name and number on our machine (291-0332).

Forty members will be "on the road again," for a fantastic weekend of collecting, educating and socializing.

For lodging, please make your check payable to The Oxford Motel and send it to me at 1106 Clayton Drive, South Bend, IN 46614. I need your check before June 24 in order to get them to the motel before the end of June. Costs are as follows, for two nights:

2 double beds -- \$94.14

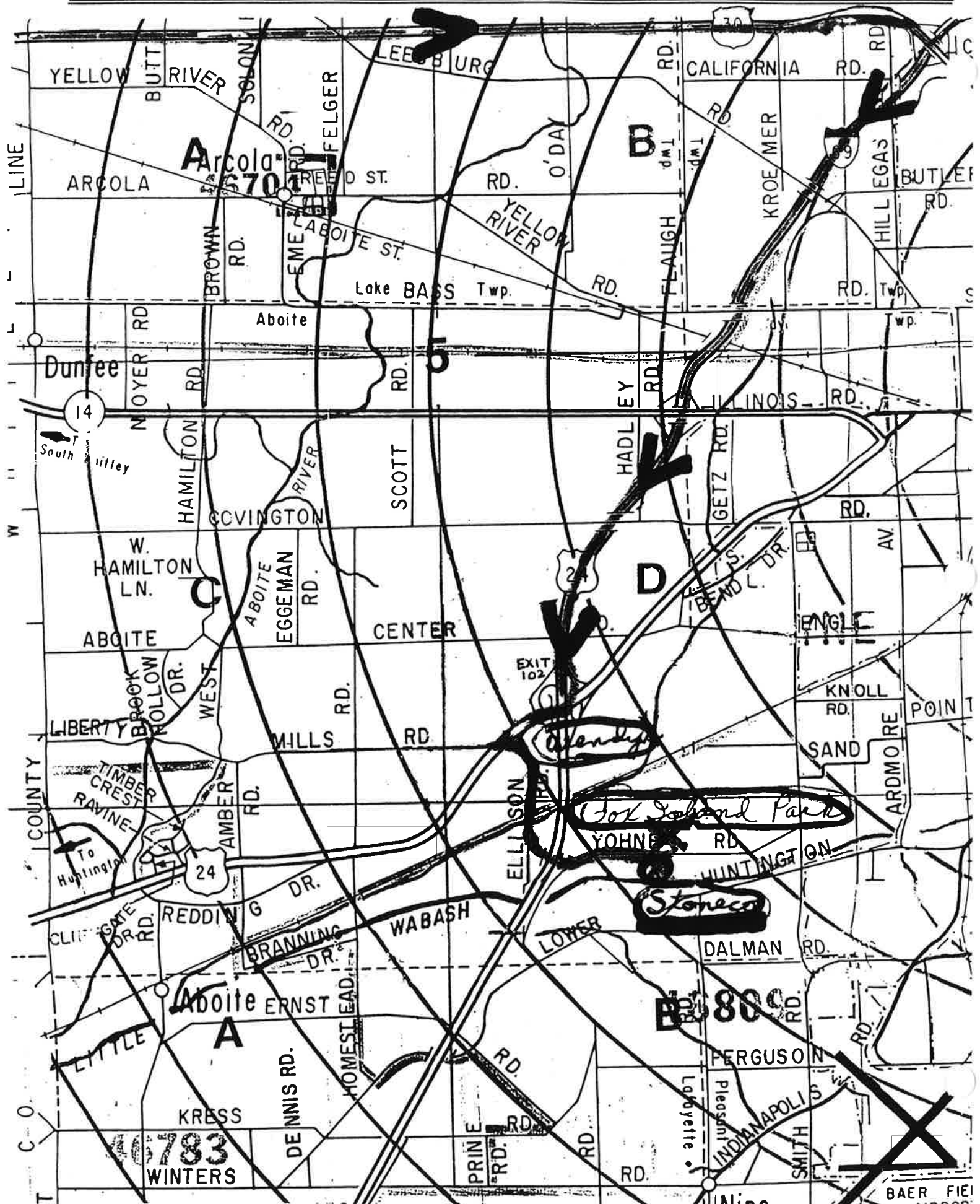
1 double bed -- \$78.40

1 single bed -- \$62.72

Your only other expense will be a Saturday night group dinner and a light Sunday lunch.

A more detailed report will be included in the September *Rockfinder* as to the itinerary and what to bring. We will board the bus at the K-Mart parking lot on the corner of Ireland Road and 31/33 south at 3:45 PM, departing promptly at 4 PM on September 27. Return time is 6PM on Sunday, September 29.

We will not only enjoy a favorite part of our hobby, but the beautiful color season of fall. I know we are all looking forward to this trip with anticipation and enthusiasm.



## MINUTES OF THE MARCH MEETING

By Emily Johnson, Secretary

President Heinek opened the meeting at 2 pm at the church. The minutes of the previous meeting were unanimously approved as printed in the Rockfinder, on a motion by Phyllis Luckert. Pam Rubenstein gave the treasurer's report. She also reported that all funds still owed to the club from the fall show have been collected.

The program was presented by Donna Mark, who instructed the group on bead-stringing and selecting beads for wearable art. Bead boards and stringing needles were available.

Kathy Miller reported on reservations for upcoming bus trips. Seats are almost filled up, but check with Kathy if you want to sign up for Mazon Creek in April. Bus is free to active club members. Gordon Dobecki suggested that open seats could go to some of his students (with a parent), if they sign a liability release, since they are not covered by the club's insurance.

Kathy also described the June 8 field trip to Stoneco Quarry near Ft. Wayne. Calcite, fluorite, sphaerite and excellent pyrite specimens can be found. More information later.

Other ideas mentioned for field trips included: Geode Glen Park in Warsaw, IL (self-guided), and La-Farge Quarry in Buffalo, IA (self-guided).

Margaret mentioned that the Midwest Federation convention and show will be held in July at Macomb, IL, and encouraged members to attend.

Sr. Jeanne Finske and Tom Noe were hosts for the meeting. Thanks for the goodies!

Other business and miscellaneous: We welcomed five guests to the meeting. Next month's program will look at the holistic aspect of crystals, with a guest speaker from The Crystal Connection. Door prizes were won by junior members and junior guests and by Sr. Jeanne Finske.

## MINUTES OF APRIL MEETING

The April meeting of the Michiana Gem & Mineral Society was opened by Pres. Heinek at 2 PM April 28 at Our Redeemer Lutheran Church.

Two guests were introduced, Nora Schwieger and Una Shankland. New members were introduced, Paula Stanley and sons, Jacob and Benjamin.

As there were no minutes in the *Rockfinder* this month, they could not be approved. Pam Rubenstein, Treasurer, gave her report, which will be filed for audit.

Hosts are Mike Slattery and Phyllis and Herb Luckert.

Tom Noe told about his display of Bubble Gum, Prairie and Fairburn agate that he had collected on his trip west in 1995.

Gordon Dobecki reported that his classes were over for the summer.

Sister Jeanne reported on get-well cards, birthday and anniversary cards she had sent.

Kathy Miller reported on the field trip our club will have with the Fort Wayne club at the Stoneco Quarry on Sat. June 8th in Fort Wayne.

Tom Noe reported on the Silent Auction sale he held at the South Bend show in April. The proceeds were for the Michiana Club treasury and will help with the expense of our bus trips. Everyone enjoyed the April field trip to Ill.

Old business-- A couple of seats and one motel room is left for the September week-end bus trip. Kathy Miller asked that all who had reserved a room to send a check for one night motel payment to her made out to the Oxford Motel, and sent to Kathy no later than June 24.

New Business-- None.

Mike introduced our speaker, Donna. She spoke of her interest in the healing properties of crystals. She warned every one to be careful around malachite, as it is poison. Several members also spoke about care in grinding and polishing it, which must be done wearing a mask. She explained that all crystals have the power to heal every part of the body. The program was enjoyed by all.

The meeting was closed at 3:45 for refreshments and door prizes. Prizes were won by Sister Georgia, Margaret Schultz, Diane Schmidt and Gordon Dobecki. Juniors winning were Jacob and Benjamin Stanley, Alec Rubenstein and David O'Tousa.

Sister Georgia, Sec. Pro-Tem

**HIGH-GRADER FROM HADES**

by Anita Collins  
libawc@emory.edu

My husband likes to holler,  
He likes to scream and moan  
That the ugly rocks he finds afield  
I won't let him take home.

I'm the High-Grader from Hades.  
You might say I am choosey.  
I ransack my husband's buckets  
And toss out all his doosies.

I throw out rocks both big and small;  
Size isn't the real issue,  
And when his cheeks are streaked with tears  
I hand him a dry tissue.

I'm the High-Grader from Hades  
How could he really choose  
A rock that has no sparkle,  
No splash of greens or blues?

I asked him why he even stooped  
To pick up this grey blob,  
But I couldn't hear his answer  
Through the sniveling and the sobs.

I'm the High-Grader from Hades.  
To him it's all too real.  
I throw his rocks both far and wide  
And do it with such zeal.

What made him want to take this home?  
It has no crystal faces,  
There is no iridescence,  
And it's broken in three places.

I'm the High-Grader from Hades.  
I won't let him bring home  
A "yard rock" that's so very big  
It takes up two time zones.



I know that there's a reason  
Why he had to have this shale.  
If he splits it open enough times,  
Inside he'll find a whale.

I'm the High-Grader from Hades,  
Of this we both are certain,  
But he thanks me in the morning  
When his back and legs aren't hurtin'.

It's not that I am vicious,  
It's not that I'm a louse,  
It's just that we've run out of room  
In our three-story house.

**JUNE CULP ZEITNER WILL SPEAK AT LIZZADRO MUSEUM**

"Rock Hunting in the Midwest" will be the topic of Mrs. Zeitner's slide show/talk at the Lizzadro Museum of Lapidary Art in Elmhurst, IL, on July 20 and 21 at 2:00 PM. June is a well-known and well-traveled author and lapidary enthusiast, as well as a regular columnist in *Lapidary Journal*. She is the author of the books *Midwest Gem*, *Fossil and Mineral Trails* and the just-released *Gem and Lapidary Materials*. June will be available to sign copies of her new book after the lecture.

Her talk will give special emphasis to the Upper Peninsula of Michigan. Reservations are recommended (708-833-1616). There is an admission charge.



## ELDERHOSTELS FOR ROCKHOUNDS

Club member Herb Luckert ran across a list of summer elderhostel programs which might be of interest to rockhounds in their vacation travels. Usually these programs provide room, board and a variety of classes or workshops covering a wide range of topics. (Examples include prehistoric Indians, geology of areas such as the Grand Canyon or the San Andreas Fault, mineral studies in gold, lead, quartz, etc., volcanoes, mining, dunes, the Mississippi River, Yellowstone National Park, dinosaurs, and so on.) Most run for less than a week and many are sponsored by colleges or schools. A five day session would cost around \$320 typically.

The list of elderhostel programs is available through Tom Noe. Dates go from July through September, and you must be 55 years of age or older. Locations in the U.S. and Canada are included, covering many programs coast to coast.

Tom also has information on several weekend or weeklong field trips to dig for dinosaurs in the Rockies. These earth-moving experiences are sponsored by scientists who will train you in correct excavation procedures. Various dates from June through August.

## WHAT'S STRONGER THAN STEEL, AND SPRINGIER THAN PLASTIC?

The answer is quartz--the same silicon dioxide that rockhounds love to cut and polish in all its many forms. We think of quartz as a brittle and unyielding cutting material. But now we find that springs made of pure quartz are far superior to metal springs for use in certain delicate instruments.

Unlike metal, the quartz springs do not pull out of shape, no matter how long or how much they are stretched. In addition, quartz is stable over a wide temperature range and is not affected by adverse weather or chemical conditions. It is an almost perfectly elastic material until it breaks, and its elastic limit and breaking point seem fortunately to coincide.

These beautiful little, clear coil springs of quartz play vital roles in the success of oil hunters and the safety of airlines. In the never-ending quest

for new oil fields, the major application of the quartz springs is in gravity meters. The gravity meter is a spring balance capable of measuring the mass of below-surface formations as it is moved over the earth. Geologists and geophysicists use this important information to pinpoint potential oil-bearing rocks.

In the aircraft business, very delicate pressure gauges with quartz springs are used to calibrate altimeters--the life-and-death instruments pilots must have to tell their distance from the ground. Altimeter calibration is a precision job that formerly required many hours. Now, with the introduction of quartz springs, this can be accurately accomplished in a few minutes. This new calibration procedure has greatly improved accuracy by minimizing human errors inherent in the long-drawn-out old method.

So good old quartz,  $\text{SiO}_2$ , the primary ingredient of sand, window glass, flint, chert, agate, jasper, opal, etc., continues to demonstrate yet another facet of its wondrous range of versatility.

*From The Mountain Gem*



## QUARTZ IN ARKANSAS

The U. S. Forest Service now has a quartz mine in Montgomery County which is open for recreational collecting. It is on a mountain top with a spectacular view of Lake Ouachita and is a 20-minute uphill hike to get to. Collecting will be with hand tools only, and patient and persistent collectors should be rewarded, as will searching the old dumps. Stop by the ranger station east of Mt. Ida, called Womble Station, to buy maps or get directions to the mine for collecting.

## JUSTICE COMES TO TWO GUYS WHO SHOULD HAVE STAYED IN BED

In a clear case of being in the wrong place at the wrong time, being down on your luck, or just plain having bad karma, Buford Morris, 44, and Steven Irving, 27, decided to loot a prehistoric Cahuilla indian village in Coachella, California, at about the same time that 50 law-enforcement personnel and archaeologists were scheduled to visit the site as part of an Archaeological Resources Protection Act training class. The scene was somewhat comic in its proportions. The puzzlement of the looters at the sudden arrival of 50 people (whose law-enforcement status was disguised by street clothes) was matched only by the suspicion of the class members, who were convinced that the instructors had deviously staged the event as part of the training.

BLM archaeologist Mike Mitchell, who was leading the tour, approached the first man and casually asked, "What are you doing?" Not fully realizing the predicament he was in, the man smiled, and held up a plastic bag full of potsherds and replied, "Oh, I'm just looking around for old Indian stuff. What are you guys doing...taking a tour?" "You might say that," Mike replied. A search of the suspects' vehicle turned up potsherds, customized probing tools and a map of Joshua Tree National Park marked with the locations of several archaeological sites. Morris and Irvin were taken into custody and pled guilty in Riverside County Court of violating state antiquities and firearms laws. Each man was fined \$660 and sentenced to three years on probation.

From *BLM Newsletter* (October, 1995)

## EVEN IN WILDERNESS, THERE'S NO ESCAPING BUREAUCRACY

By Alston Chase

Consider an event that took place last August, in the newly established East Mojave National Preserve in California.

Until this area was made a national park in 1994, it had been the responsibility of the Bureau of Land

Management, which routinely granted state biologists permission to fly helicopters over the area, to check on the rare, wild bighorn sheep that lived there. But this year, the National Park Service, as new landlords, refused to let biologists conduct this flight. As a consequence, 38 sheep – one sixth of this fragile population – died.

When some drinking holes went dry, the sheep, left unattended, apparently dislodged the cover of a water-holding tank. Some fell into the tank and drowned. Others died of poisoning, after drinking from the tank contaminated by carcasses of dead sheep. Still others, unable to reach the water, died of dehydration. If the state biologists had been able to check on the sheep as they requested, this wouldn't have happened.

From *Blue Ribbon Magazine* (Jan., 1996)

## GIRL'S DISCOVERY BEATS DINOSAUR MUSEUM PROS



EDMONTON – Tess Owen, a 12-year-old amateur fossil hunter, exploring with her father and younger brother, made an important find near Edmonton. Poking around the rocks near the site of a partial tyrannosaur skeleton, examined earlier by paleontologists from the Royal Tyrrell Museum, Tess spotted a peculiar pattern of symmetrical, raised bumps on a rock surface. Her father photographed the find and contacted the museum. Technicians eventually examined the specimen, confirming that it was the impression of a tyrannosaur, one of the group of carnivorous dinosaurs including *Tyrannosaurus* and *Albertosaurus*. The specimen was cut out and removed to the museum for further study.

Dr. Phil Currie of the Tyrrell Museum stated that the specimen was "by far the best" of only three known specimens of tyrannosaur skin impressions. As for the find having been made by a 12-year-old amateur, Currie suggests that his crew must have overlooked it, because they had their minds set on finding bones: "Not having the same prejudice that everyone else had in terms of looking at the bones she found the skin impression. It was one of those things that is a humbling experience for the rest of us."



From *Calgary Herald* (March 18, 1995)

**TURNED TO STONE, Part 2**  
(continued from last month)

*Each year the federations (AFMS & regional) make awards to authors for their contributions of published articles. The following is FMLS 1992 trophy award for best educational article.*

By Wolfgang Vogt

**Pseudofossils:** The word "pseudofossil" is sometimes used for a natural object, structure, or mineral of organic origin that may resemble or be mistaken for a fossil. Sometimes stains on rocks are produced due to the presence of decaying vegetable matter. These stains often resemble leaves. Dendrites, usually composed of manganese dioxide, hematite or pyrite, are branching mineral incrustations and can be mistaken for fossil mosses or ferns.

**Polymorphs:** Polymorphism is the phenomenon whereby a substance (element or compound) may exist with several distinct crystal structures depending upon temperature and/or pressure. The classic examples of this phenomenon are diamond and graphite, both examples illustrating polymorphism in carbon. This difference in the crystal structures of the two substances is responsible for the hardness of diamond and the slipperiness of graphite. Minerals which have two crystal structures are called dimorphic. Those which have three are trimorphic, and those with more than three are called polymorphic, i.e., many forms. The crystal structure assumed by a certain species may be ideal under the conditions prevailing at the time of growth. However, under different conditions, another structure may be favored by the crystal ions or atoms. As a result, they accordingly shift slightly from their former position.

When no change in chemical composition of the material is involved, the several distinctive crystal structures are called polymorphs. Diamond and graphite are good examples of materials which have the same composition, but have structural characteristics that are differently stable under varying conditions of temperature and pressure. Diamond is stable in regions of high temperature and pressure. Graphite is stable in regions of low temperature and pressure.

Polymorphism is very rarely found in the fossil world.

Then, believe it or not, there is talk of the existence of **Paramorphs!**

A paramorph is really a pseudomorph with the same composition as the original crystal. The mineral has simply rearranged its atoms into a different configuration, that is, one that no longer coincides with the original crystal outline. The most familiar example of a paramorph is calcite after aragonite. Paramorphism is definitely linked to the phenomenon of pseudomorphism in which a mineral is substituted not by one of its polymorphs, but by a totally different mineral with a different, though perhaps similar, chemical composition. Paramorphism is also extremely rare in the fossil world.

To make matters worse, there are also those **Pseudo-Pseudomorphs**. Pseudo-pseudos are those objects with no orientable shape, since they are not regulated by the laws of crystallization. These things preserve only the form of an empty space lined with crystals.

**Silicification or Agatization:** These words are often used to describe the process of fossilization. Both words mean the same thing, i.e., that the original components of an organism are replaced by quartz, chalcedony or opal. In the latter case, the word "opalized" is used, as, for example, in the case of "opalized wood."

**Calcification:** When the original hard parts of an animal or plant are replaced by the mineral calcite (calcium carbonate), the alteration process is known as calcification. If the original hard parts of a fossil, such as shells, are buried for millions of years and remain chemically unchanged, they are often preserved in a calcified state.

**Pyritization** is a process of molecular replacement, just like silicification. However, in this case the replacing minerals are pyrite or marcasite.

**Carbonization** occurs as a result of action by chemicals, bacteria, heat or pressure in the absence of oxygen. For example, burial of a specimen at the bottom of a bog or a swamp provides just such anaerobic conditions. The absence of oxygen in these cases prevents the

normal decay of delicate tissue, such as that of the soft-bodied animals and of leaves, into carbon dioxide and water (both gases, and thus not left behind). Instead, these animal and plant remains slowly lose the oxygen, hydrogen, nitrogen and sulfur from their cellulose and proteins, while the carbon that also was there as part of these tissues remains behind.

Carbonized plant material is often found in various stages of carbonization, and at its extreme appears as a shiny black film showing more or less distinct forms and/or structure of the original material. Carbonization is present in the material found at St. Clair. (The white coating on top of some of the material found there is pyrophyllite, a silicate mineral, which entered later in the fossilization process, after the carbonization was complete. The pyrophyllite is not part of the preservation process because, if it is scraped away, the imprint of the leaf is still there. Carbonization, on the largest and most extreme scale, is coal.

If at this point you are still reading, I will assume that you must have been truly fascinated to learn about the close relationships between some of these terms. On the other hand, perhaps you had nothing better to do, in which case I suggest a metamorphism to stamp collecting. Do this before you permineralize, calcify, agatize, silicify, or, God forbid, turn into a pseudomorph, or worse yet, into a pseudo-pseudomorph! Do it before you fossilize!

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From *NJPS Paleontograph* (V, 91)

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