

# THE ROCKFINDER

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



# THE ROCKFINDER

FEBRUARY, 2001

# 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 held the fourth Sunday of each month, 2:00 PM, EST, 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 general meetings. The annual club show is Labor Day weekend.

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 Yearly Membership Dues (Payable by January 1)  
 \_\_\_\_\_ Individual \$10.00 per year  
 \_\_\_\_\_ Family \$15.00 per year  
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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.

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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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Name \_\_\_\_\_  
 Birthday \_\_\_\_\_

Name \_\_\_\_\_  
 Birthday \_\_\_\_\_

Name \_\_\_\_\_  
 Birthday \_\_\_\_\_

Date of Wedding Anniversary \_\_\_\_\_

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### PLEASE READ AND SIGN THIS SECTION:

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.

Signed \_\_\_\_\_ Date \_\_\_\_\_

# THE ROCKFINDER

Newsletter of the Michiana Gem & Mineral Society

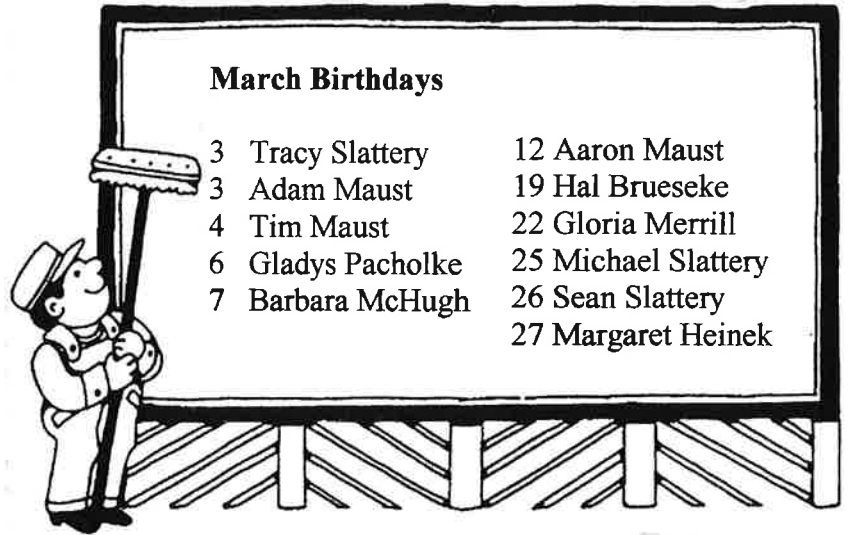
Volume 41, Number 2

February, 2001

**Meeting:** Sunday, February 25<sup>th</sup>  
Doors open 1:30 p.m.  
Meeting at 2:00 p.m.  
Guests are always welcome.

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

**Hosts:** Diane Gram, Pam Rubenstein,  
Phyllis Smallwood



**rogram:** There will be a short video on Canyonlands National Park, near Moab, Utah. Bob and Margaret Heinek and Kathy and Bob Miller went to the AFMS Convention in early October, 2000. They will have displays and information on this area to show what an interesting area it is to visit. Some of the attractions are Arches National Park, Island in the Sky, Indian artwork drawn on the rock walls, desert scenery and rock-hunting trips. Bob and Kathy will have samples of what they were able to find. Margaret was able to get a piece of very rare redwood for their collection.

## UP AND COMING

Mar. 3-4: Geodeland show, University of Western Illinois, Macomb, IL.

Mar. 9-11: Rockford, IL, show.

Mar. 9-11: Eastern Indiana Gem & Geological Society show, Wayne County Fairgrounds, Richmond, IN.

Mar. 16-18: Michigan Gem & Mineral Society show, 355 Napoleon Road, Michigan Center, MI.

Mar. 17-18: Stark County Gem & Mineral Club show, Canton Civic Center, Canton, OH.

Mar. 17-18: Cedar Valley Rocks & Minerals Society show, Cedar Rapids, IA.

Mar. 24: Metro Rock Swap, 23400 Wick Rd., Taylor, MI.

Mar. 24-25: Badger Lapidary & Geological Soc. show, Monroe, WI.

Mar. 31- Apr. 1: Columbus Club and Licking County Club combined show, Newark, OH.

Mar. 30-Apr. 1: MAPS Expo, Macomb, IL, fossils only.

Apr. 5-7: Indian Mounds Rock & Mineral Club show, Breton Village Mall, Grand Rapids, MI.

**Apr. 6-8: South Bend Gem Show, Century Center, South Bend.**

Apr. 21-22: Blossomland Gem & Mineral Society show, Cook Nuclear Center, Bridgman, MI. Free admission.

Apr. 27-29: Mt. Clemens Gem & Lapidary Society show, 300 N. Grosbeck, Mt. Clemens, MI.

May 4-6: Kalamazoo Geological & Mineral Society show, Fairgrounds, Kalamazoo, MI.

May 5-6: Greater Cincinnati Gem, Mineral & Fossil show, Cincinnati Convention Center, 5<sup>th</sup> & Elm.

June 8-10: Rocky Mountain Federation show, New Mexico.

## MINUTES OF THE JANUARY MEETING

The January meeting began with the program. As members arrived, they were invited to join in an assembly line setup to make bags to hold small rocks and fossils. These will be handed out to youth at the next club show. Some members were measuring cloth, some were cutting out the bags, some were stamping the club's name on Pellon, which will later be ironed onto the bags as they are sewn together.

On display at the meeting were various rock collections, fossils and pamphlets.

A reporter and photographer from the South Bend Tribune were on hand interviewing the busy workers and snapping informal pictures for a future article in the newspaper. The hospitality committee encouraged everyone to enjoy the refreshments, which were provided by David and Sally Peltz.

After the reporter left, Vice-President Margaret Heinek, in the absence of President Don Church, called the business meeting to order. The minutes of the December meeting were accepted unanimously as printed in the *Rockfinder*. The financial report was read and filed for audit.

New business: Tom McLaughlin recommended that we buy a new 10-12 cup coffeemaker for the club's use. Margaret then mentioned that she has one that we might be able to use. Tom then withdrew his recommendation until we decide upon Margaret's offer.

Gordon Dobecki would like to hear from members of the club. He still has his old telephone number. His address is P.O. Box 506, Selma, OR, 97538.

There was no formal agenda for the meeting, so the business portion was short. Present were 17 adults and 2 guests. Door prizes went to Sally Peltz, Diane Gram and Phyllis Smallwood. Emily Johnson made the motion to adjourn, which was voted in unanimously.



South Bend  
April 2001  
**Gem Show  
and Sale**  
at the  
**Century Center**

120 S St Joseph St, South Bend, Ind

**April 6, 7, 8, 2001**

Friday - 2pm to 7pm / Saturday - 10am to 6pm  
Sunday - 10am to 4pm

Adults-\$2.50 daily

6 to 16-\$1 daily

Under 6-Free

Handicap Accessible

Quality Dealers

Bring this card for a discount of 50 cents for each adult in your party. No other discount applies.

## SHEEP MOUNTAIN TABLE

By Tom Noe

(Note, Sheep Mountain Table is the name of a mesa in Badlands National Park.)

It is not a table intended for dining,  
Though the edges are eating the center,  
And sheep have foraged at the margins,  
Where grass stretches bare-rooted into space.  
Erosion grazes now on the top  
And when it comes time for dessert  
This will be a dry, heapless prairie  
Fully horizoned,  
Just as fully sky as land,  
Just as fully air as earth.  
Whatever held it together is no longer holding on.

## NEW FINAL SURFACE MINING RULES PUBLISHED BY BLM

On November 21, 2000, the BLM published new Mining Rules that will have some effect on rock collecting on federal lands. The ALAA and other rockhounds commented on the draft rules published earlier in the year. We are happy to note that some of the concerns voiced by us, our members and others did have an impact in altering the language of the new rules. We are especially relieved with the language change regarding group collecting activities. We quote from the BLM explanation that accompanied the new rules.

### *Section 3809.31. Are There Any Special Situations That Affect What Submittals I Must Make Before I Conduct Operations?*

*Final Sec. 3809.31 is derived from proposed Sec. 3809.11 (Alternative 1). Final Sec. 3809.31(a) is based on proposed Sec. 3809.11(e), which would have required the representative of any group, such as a mining club, that is involved in any recreational mining activities to contact BLM at least 15 days before initiating any activities. The purpose of the contact would have been to allow BLM to determine whether to require the group to file a notice or a plan of operations.*

*The language in proposed Sec. 3809.11(e) has been deleted from the final rule. We received many comments from rock collectors and clubs indicating the proposed rule was vague regarding when a notice or plan of operations would be required for recreational mining activities by a group. Other commenters strongly felt that recreational and mineral collecting groups should not be singled out and have to submit a notice or a plan of operations. They indicated that it is an unreasonable requirement and, in some cases, mineral-collecting groups could not afford the financial guarantees, which they felt are unnecessary for those who use hand tools.*

*Final Sec. 3809.31(a) differs from the proposal, in response to comments. Under the final rule, the BLM State Director may establish specific areas where the cumulative effects of casual use by individuals or groups have resulted in, or are reasonably expected to result in, more than negligible disturbance. In these areas, any individual or group intending to*

*conduct activities under the mining laws must contact BLM 15 calendar days before beginning activities. BLM would use the 15 day period to determine whether the individual or group must submit a notice or plan of operations. BLM will notify the public of the boundaries of these specific areas through Federal Register notices and postings in local BLM offices.*

*As discussed earlier in the preamble discussion of the definition of "casual use," BLM received many comments on whether, and if so, how to regulate recreational mining activities; whether recreational mining should be considered casual use; how to handle casual use activities that cumulatively cause adverse impacts; and what activities are encompassed by the term "recreational mining activities." After carefully considering the public comments and the interrelationships of the various issues raised by the commenters, in response to proposed Sec. 3809.11(e), BLM has decided that our regulatory framework will ultimately be more effective in preventing unnecessary or undue degradation if we focus not on the purpose of the activities occurring on public lands, the types of groups involved, and the definitions of "casual use" and "recreational mining," but rather on the impacts associated with the activities carried out under the mining laws on public lands.*

*To that end, we are adopting a regulation that avoids trying to discern the motivations of people who go upon the public lands (that is, commercial motive versus recreational motive), treats all individuals and groups in a similar manner (imposes no special requirements solely on mining clubs), and allows weekend miners and others who cause no or negligible disturbance to continue their customary activities, while at the same time giving BLM a way to regulate the cumulative effects of "casual use" activities. BLM field managers know which areas under their jurisdiction are popular with the general public for small-scale panning, washing, prospecting, rock collecting, and other mining-related activities. In some cases, such as when dozens or hundreds of "rock hounds" gather for a weekend outing, activities that if carried out individually would be "casual use" can cause a much greater level of disturbance. The final rule gives the BLM manager a way to sensibly regulate activities based on existing or anticipated impacts to the public lands.*

## THE LOST GOLD RUSH

By Sam Maselli

The Spanish explorer Hernando de Soto and his soldiers sought gold and the Indians of the area that is now Georgia wore ornaments of gold, shell and stones. The Spaniards found and mined gold in northern Georgia until poor equipment, yellow fever and hostile Indians forced them to give it up. Somehow the gold went unnoticed for hundreds of years until in 1815 a Cherokee Indian boy found a gold pebble which his mother sold to a white settler. Encroachment by settlers on Indian land forced the Indians to form the Cherokee Nation. Benjamin Parks, while hunting in 1828, found a chunk of gold and started North America's first gold rush.

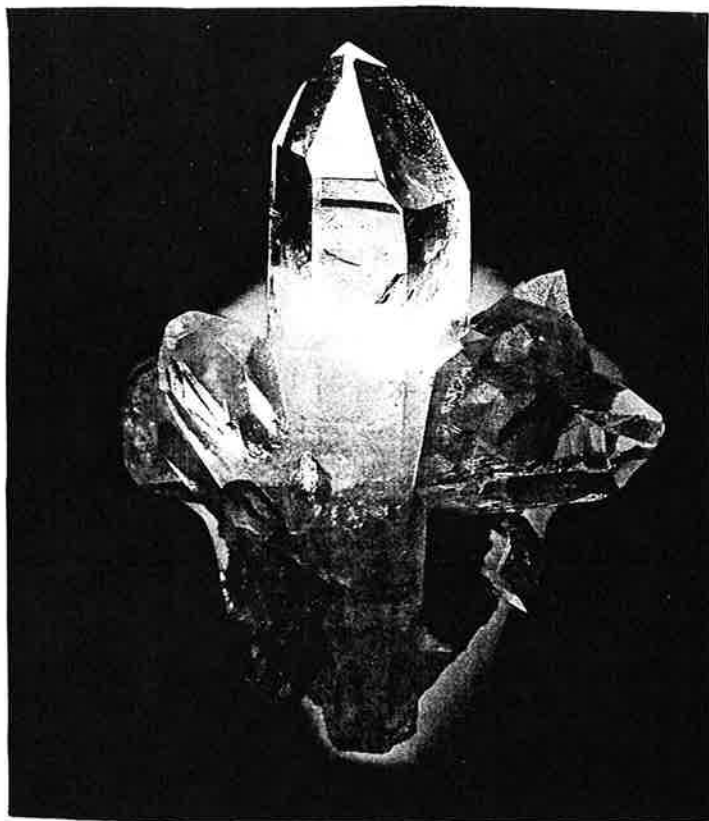
The discovery was made a few yards from the boundary of Indian land but the government was unable to protect that land from the thousands of gold seekers who poured into the area. The answer they devised to solve this problem was to create Cherokee County, which included all the gold land and which was sold off by lottery to free white residents. The era of the small miner lasted from 1830 to 1833. After that, mining became more commercial and organized. The government made a treaty with the Cherokees in 1838 and federal troops forced the Indians to leave for reservations in America's West.

Major activity ended in 1849, as the miners left for the California gold fields. The assayer at Dahlonega, M. F. Stephenson, tried to stop the 200 miners from heading out by pointing to Findly Ridge and its rich mines and saying "Why go to California? There's gold in them thar hills." The miners left and some of them took part in many of the gold strikes in the West and Alaska. Stephenson was right, between 1830 and 1933 27,000 kilograms of gold were taken from this area, which is nine distinct belts in nine counties and has 500 gold-bearing properties.

Today many of us go to this same area for the abundant garnet and emerald deposits as well as many other gemstones. We seldom think of gold, but maybe as you hunt for rocks you might throw a metal detector in the back of your car because, as Dr. Stephenson said, "There's gold in them thar hills."

References: *Gold in the Georgia Hills*, T. Conn Bryan. *General Information on Gold in Georgia*, Wendy C. Rozov, *Minerals of Georgia*, Robert B. Cook.

*The Tully* (Feb.-Mar., 2000)



## WHAT'S SO SPECIAL ABOUT ARKANSAS QUARTZ CRYSTALS?

By Jon Erlandson

Arkansas quartz crystals are regarded as some of the world's finest. The quartz in the Ouachita Mountains contains very little contaminant. Water-clear quartz is the specialty and it is found throughout the mountains. Ron's mine, the Old Coleman Mine, is distinguished not only as the largest producer, but also as the purest source for quartz crystal. The uniqueness of this deposit is a result of how the quartz developed. Most quartz has been formed through volcanic activity, where fractures on the earth's crust allowed hot silica-laden water-based fluids, heated to high temperatures by volcanic activity, to leach into crevices within the earth. As the fluids passed along their route, contaminants were introduced by the various minerals these fluids came in contact with. When the fluids encountered favorable conditions, silica began to be deposited and from that the quartz mineral grew.

The crystals found in the Ouachita Mountains are thought to have formed in a different and non-volcanic manner. The forces created during the

building of the mountains are thought to have "squeezed" water from the underlying unit of shale and sandstone. Because of the depth of burial of the sandstone and shale units (perhaps tens of thousands of feet) and also as a result of the high pressures developed within the sedimentary units during the mountain building process, the water was heated to very high temperatures (260 degrees C/ 500 degrees F). This hot water, derived from the trapped original sea water, was very different from fluids originating from igneous sources, in particular it contained fewer dissolved minerals. You can easily see the difference if you compare samples of the crystals. Quartz from Brazil and Chile is volcanic in origin. Although crystals from either source can be well formed, the difference in clarity is truly noticeable due to the different conditions of growth.

Original source not noted. Via *Rockytier* (Nov., 1999)

### KNOW YOUR MINERALS: HOWLITE

By Charles Stratton

Howlite, a decorative stone used for bookends, clock faces and bowls, is often dyed blue to substitute for turquoise, but there are enough slight differences that no turquoise buyer need be deceived. It need not be considered an imitation since it is generally offered simply as dyed howlite.

Named after Henry How, a Nova Scotia chemist, geologist and mineralogist who found the material in Nova Scotia, howlite is also found in California, especially in Tick Canyon near Saugus in Los Angeles County. The milk-white, black-veined material is a calcium silica borate with a somewhat variable composition.

The mineral generally occurs as nodules of very fine monoclinic crystals. Some of the nodular masses may be of great size, weighing hundreds of pounds.

Howlite is usually found in conjunction with two other boron minerals; colemanite, a hydrous calcium borate, and ulexite, a sodium calcium borate which is the famous TV stone, whose crystals have striking fiberoptic properties.

Try your ultraviolet light on howlite, since howlite fluoresces brownish yellow with short-wave ultraviolet.

*Snoopy Gems* (Mar., 1997)

### "GANGUE-WAY, EVERYONE"

By Bob Floyd

Many minerals, such as fluorite, calcite, barite, celestite and others, are referred to disparagingly as "gangue" minerals because they are found in some metalliferous veins with valuable ores. The term "gangue" is from the French, "gangue," as well as from the German and Anglo-Saxon, "gang," which means "a going," or "a way"; all of which refer to the "way" many minerals and metals "go" into veins.

All of this means that fluorite, celestite, barite, calcite and other nonmetal minerals are considered a "waste" mineral that has no value. It might be of no value only if a gang of rockhounds and glowhounds were to make a vain attempt to find some. They, too, would probably be listed disparagingly for having made such waste in such a vain attempt, and received no value. Bob Jones writes that gangue minerals "are the nonmetallic waste minerals which occur with the pay streak. The term 'waste' is almost laughable in most cases, because it can happen that well-crystallized specimens of the gangue minerals can bring more money for one good specimen than a ton of the metallic rock being removed by the miners!" Braithwaite would agree, writing that "The gangue minerals of calcite, barite and fluorite in the Derbyshire orefield...are of both industrial and specimen value."

In 1949, two Harvard geology professors, M. E. Mrose and J. Weiss-Frondel, were searching a gangue/tailings dump outside a mica mine in New Hampshire, when they found crystals of a previously unknown type anywhere in the world! They named it "Hurlbutite" in honor of the well-known Harvard mineralogist Comelius S. Hurlbut. Its chemical content is  $\text{CaBe}_2(\text{PO}_4)_2$ . They may not have gained any fortune from their gangue findings, but they did gain some fame.

Gangue-way, everyone; lets head for the tailings!

*Rocky Reader* (Sept., 2000)

## FASCINATING FACTS ABOUT SILVER

By Jennifer Adams

Although silver was discovered later than gold and copper, it has been known and used by humankind since prehistoric times. Herodotus, the Greek historian, knew of silver used to make coins and beads, exploited from the river sands of the Pactolus in Lydia. The Chinese wrote of silver metals in 2500 B.C. In the earliest prehistoric strata at the site of Troy, considerable deposits of silver and gold treasure have been excavated. Among the artifacts, silver bracelets and gold earrings, ornaments placed in a silver cup and more than 8,000 beads were buried in the ancient city 2,000 years before Christ.

The most ancient silver mines of importance were in Asia Minor and on islands in the Aegean Sea. The Romans obtained most of their silver from Spain until supplies became scarce during the Middle Ages. After the discovery of the Americas in 1492, Mexico became the largest silver-producing area in the world. Canada and the United States also produce significant amounts of silver.

Silver is a lustrous white metal, widely distributed in nature. In ores, it is commonly associated with gold, lead and copper. Much of the world's silver is obtained as a byproduct of smelting these other metals. Horn-silver ( $\text{AgCl}$ ) is found in the oxidized portions of ore-bearing lodes near the surface. Small amounts of silver in the oxidation zone form as the more complex compounds erode and weather. At deeper levels, silver occurs as sulfides, arsenides, antimonides (compounds of silver with sulfur, arsenic and antimony, respectively). In these deposits, formation is the result of deposition from primary hydrothermal solutions. Argentite ( $\text{Ag}_2\text{S}$ , silver sulfide) occurs in low-temperature hydrothermal veins in association with other silver minerals or sometimes in the cementation zone of lead and zinc deposits.

When found in a metallic state, it is called "native silver." Native silver usually occurs in dendritic and wire-like forms which are aggregates of minute crystals. Silver may also occur in thin sheets or in large masses. In Konigsberg, Norway, magnificent crystalline wire specimens occur in association with sulfides, calcite, barite, fluorite and quartz.

The world's largest specimen of massive silver was mined in Aspen, Colorado, and weighs in at 844 pounds. On the Keweenaw Peninsula of Michigan small amounts of primary native silver can be found in association with native copper. In Mexico, the Guanajuato Mine has been in operation since the year 1500 A.D. During that time, more than 500 billion kilos of silver have been mined.

About three-fourths of the world's silver production is used for monetary purposes, either as coins or as bullion that governments hold to redeem paper currency. The leading industrial use of silver is for the manufacture of tableware and jewelry. The second largest industrial consumer is the photographic industry. Compounded with bromine or chlorine, silver forms the salts which register light and shade on photographic film. Silver has the highest thermal and electrical conductivity of any substance, making it ideal for use in electronic equipment. Silver is second only to gold in malleability. One ounce of silver can be drawn into a wire 30 miles long. A silver leaf can be beaten to a thickness of 1/100,000 of an inch.

*Drywasher's Gazette* (no date given)

## PRETTY IN PINK

By Sue Medina

One of the most attractive ore minerals for jewelry is rhodochrosite, a manganese carbonate ( $\text{MnCO}_3$ ). It is an ore of manganese and occurs most commonly in vast sedimentary deposits. In one location, rhodochrosite occurs as stalactites in old silver mines abandoned in the 13<sup>th</sup> century. These tunnels in the Capilltas Mine in Argentina have furnished some of the finest ornamental rhodochrosite ever found and continue to produce fine specimens. The owners of this mine currently only mine the rhodochrosite for jewelry and collecting specimens. Cavers oppose removing any material from caves, but these are man made-tunnels in which stalactites have formed over the 700-year period since the mines were abandoned by the Incas.

For jewelry, desirable rhodochrosite rough is warm pink color. Its name comes from the Greek and means "rose color." A fancy name for rhodochrosite is "Inca Rose." The rough often features concentric



bands of pink and white rhodochrosite (not white calcite). More commonly, the material is reddish brown, brown or gray. It is a very soft mineral, rating only 4 on the Mohs scale. It should be handled very carefully, as it is also brittle. Rhodochrosite crystals are in the trigonal system, forming rhombohedral crystals. Fine crystals have begun to be found again in the Home Sweet Home Mine, a historic silver mine in Alma, Colorado. The largest gem on record is a 59.65 carat oval faceted gem from Kuruman, South Africa.

Working rhodochrosite rough into jewelry can be difficult. It may tend to separate along its bands. Further, it has three directions of easy cleavage, making it brittle and weak. It is somewhat heat sensitive. Consequently, rough must be handled carefully to avoid shocks that break it and excessive heat that might harm it. The bands have different degrees of hardness, so sanding will deform the stone; use only the finest wheels and grit to smooth and polish stones. Grinding results in pits that seldom disappear during sanding. Finished rhodochrosite will oxidize, causing the surface to turn brown with age. If you have rhodochrosite jewelry, treat it gently. Be sure to protect it from bumping against harder stones or being jumbled with other jewelry that may scratch or nick it.

*Pegmatite (Nov., 1998)*

## MOLDAVITE, AN UNUSUAL GEMSTONE

Moldavite is a deep green or lime green translucent gemstone which can be cut cabochon style or faceted. Its hardness is about 5.5, as compared to the 5 of glass.

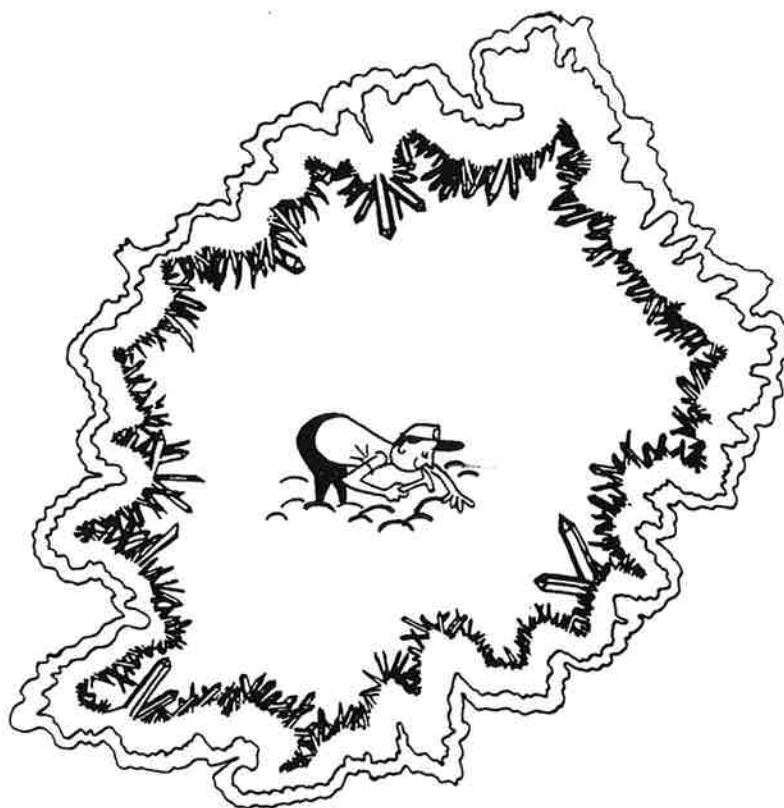
Moldavite is a rare mineral mined in only two sites in Czechoslovakia: Bohemia and Moravia. The Moldau River is near one of these sites and the mineral's name is derived from that. Scientists suspect that moldavite is extraterrestrial in origin, perhaps coming from an explosion on the moon which hurled molten material into space and into the gravitational pull of the earth. The pock-marked and wrinkled surface of the raw specimens certainly suggests that they are tektites. They are similar in composition to tektites found in other parts of the

world, except for the green color, caused by iron in combination with aluminum. Scientific dating gives it an age of 14.8 million years.

Unpolished tektites of moldavite have been found with stone fetishes dating back to prehistoric times. There is other evidence that primitive peoples of middle Europe used the stone for decorative purposes and also for trading. Legends of the Holy Grail say the holy relic was carved from "emerald" that fell from the sky. Moldavite?

For centuries, moldavite has been used as a betrothal gift between Czech sweethearts. Examples of moldavite can be found in many museums, including the Smithsonian. Because of the many interesting and graceful shapes of the raw stones, they are used in jewelry more often in their natural state than in a cut and polished form. The gemstone is quite costly, as it has been illegal for several years to mine it. Changing political conditions in Czechoslovakia are allowing more to become available.

No author, *Gem Cutters News* (Dec., 1996)



### Gem Hunt – How Many Can You Find?

A lady traveling wanted to brag to her friend about the gems she had bought on her trip. However, she feared the message might be intercepted and someone would steal her gems. So, she hid their names in an innocent letter. But her friend has a problem – there is a gem name in every line of the letter, but she can't find them all. Can you help her?

I promised to drop a line to you soon,  
We arrived in India Monday at noon;  
The robbery last night left me short of things,  
So I had to shop early for gloves and rings;  
When the plea of a beggar nettled Paul,  
He bought rutabaga, tender and small,  
We tried to stop a zebra from running amok,  
And had to rub your rabbit's foot for luck,  
On paper I do try, but somehow it all fails,  
Whenever I spin elaborate tales.

Lodestone 2/00 via Chips

### FEATHERED, FLYING DINOSAUR LINKS ANCIENT LUMBERING LIZARDS TO TODAY'S GRACEFUL BIRDS

By Paul Recer

One of the recently discovered feathered fossils from China is the first dinosaur found to be capable of flight. The 120-140 million-year-old *Archaeoraptor liaoningensis* was the size of a small turkey. It had a full set of feathers; its hands formed part of the wing structure, and its shoulder girdle and breastbone resembled that of modern birds. It had hollow bones that were strong but light enough to enable it to fly. Its tail was long and stiff, which helped it maneuver in flight, but also indicated it would not have been a good flier.

Two other dinosaurs from the collection unveiled in Washington resemble birds. The *Sinornithosaurus millenii* (Chinese bird-reptile of the millennium) was similar in size to the Archaeoraptor. It also had birdlike features and short downy feathers. However, it was probably not able to fly.

The third animal was about 7 feet long and

also was probably flightless. It appears to have had stiff, narrow feathers that helped keep it warm.

All three specimens are theropods, the group that includes *Tyrannosaurus rex*. Findings by the scientists (including Phil Currie) who analyzed the fossils suggest that even *Tyrannosaurus rex* may have had feathers at some point in its development. Perhaps the hatchlings were covered with a coat of down that was shed as they grew.

*"Researchers find fossils of primitive flying dinosaur"* Prescott, AZ Daily Courier (Oct. 17, 1999)

### HERE'S HOW TO HAND POLISH A PETOSKEY STONE:

1. Select a stone that has already been smoothed considerably by the action of beach and wave.
2. Assemble these materials: wet/dry silicon sanding paper in three grit sizes (150-220, 260-320, 340-400); styrofoam board (as used in packaging); cerium oxide or tin oxide polishing powder; a piece of felt or carpeting.
3. Place the 150-220 sandpaper on the styrofoam board, put some water on the sandpaper and rub the stone with a circular motion on the wet sandpaper. The sanding process should be performed on all surfaces of the the stone uniformly. Don't overdo it on any one area, to avoid getting flat spots on your stone. Rinse stone, sandpaper and your hands frequently to remove the buildup of sanding residue, and rinse especially thoroughly between steps.
4. Repeat step 3 with the 260-320 grit and 340-400 grit sandpapers, being sure to rinse everything thoroughly between steps.
5. Mix a small amount of either cerium oxide or tin oxide and water to make a paste, put the paste on a piece of dampened felt or carpeting and rub the stone briskly against the paste-covered felt for its final polish. (Note: toothpaste or tooth powder may be used as a substitute for the polishing powder.)
6. Rinse the stone in clear water and dry with a soft cloth.