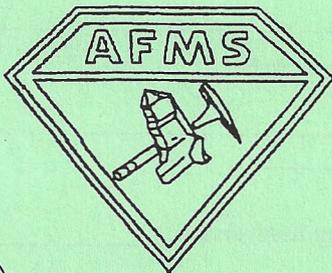
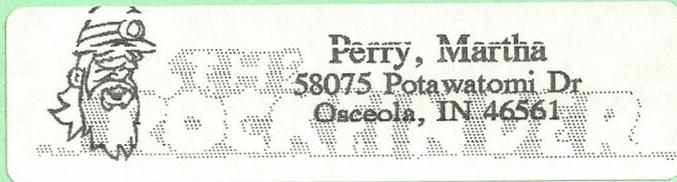
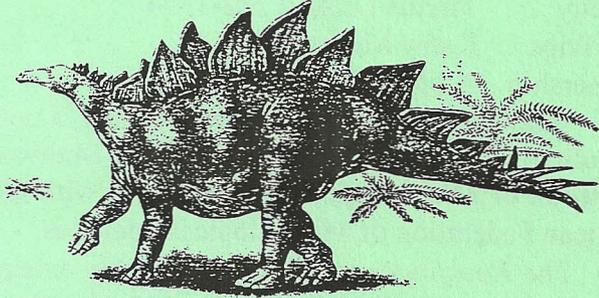


# THE ROCKFINDER

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



# THE ROCKFINDER

JUNE, 2002

# 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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Please indicate areas of special interest.

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 c/o Bob Heinek

7091 E. East Park Lane, New Carlisle, IN 46552

## HEADS OF COMMITTEES

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 Hospitality Pat McLaughlin 259-1501  
 Educational Emily Johnson  
 Librarian Diane Gram 272-6885  
 Historian Ed Miller 498-6513  
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 Membership All Members

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.

*The Rockfinder* is published monthly except July and August. Editor, Tom Noe, 305 Napoleon Blvd., South Bend, IN 46617 (ph. 289-2028). Co-editor, Herb Luckert, 221 Marquette Ave., South Bend, IN 46617 (ph. 282-1354). Reporters, Bob Heinek, Herb Luckert, club members.

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 \_\_\_\_\_

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

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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.

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

# THE ROCKFINDER

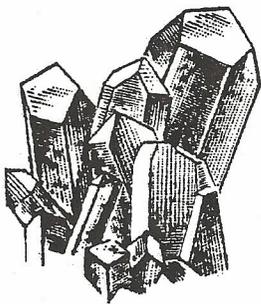
Newsletter of the Michiana Gem & Mineral Society

Volume 42, Number 6

June, 2002

**Meeting:** There is no monthly club meeting in June, July or August, and this is the last issue of *The Rockfinder* until the September issue. Have a great summer and find lots of rocks and fossils!

**NOTE:** As of now, there is no club picnic scheduled for this summer. However, many members will be gathering on August 10 for our daylong presentation at University Park Mall. See the article in this issue for more information..



## UP AND COMING

June 21-23: Gem, Mineral & Fossil Show and

Swap plus MAPS meeting, Monroe County Fairgrounds, Bloomington, IN.

June 29-30: MGAGS Rockhound Seminar, Roscommon Middle School, Roscommon, MI.

July 12-14: California Federation show, Placerville, CA.

July 16-21: Combined Northwest Federation and American Federation show, Port Townsend, WA.

**August 10: Michiana Gem & Mineral Society Day at University Park Mall. All club members are welcome to help out! See accompanying article.**

Aug. 16-18: Midwest Faceters Seminar, Mott Community College, Flint, MI.

Sept. 6-8: Toledo Gem & Rockhound Club show, Stranahan Theater Complex, Toledo, OH.

**Labor Day Weekend: Michiana Gem & Mineral Society Show, Century Center, South Bend.**

Sept. 21-22: Geology Art Fair, Eddy Geology Center, Chelsea, MI.

**Oct. 5-6: Midwest Federation show, Springfield, IL.**

Oct. 5-6: Southeast Federation show, Jacksonville, FL.

Oct. 11-13: Michigan Mineralogical Society show (Detroit), South Macomb Community College, Warren, MI.

## August Birthdays

- 10 Don Church
- 13 Todd Miller
- 23 David Peltz
- 24 Rebecca Parker
- 27 Phyllis Smallwood



## Anniversaries

- 4 Ed & Marsha Miller
- 8 Dennis & Jan Horral

## July Birthdays

- 12 Louis Jordan, Jr.
- 19 Dewey Hassler
- 24 Elma Heynssens
- 28 Pat McLaughlin

## Anniversaries

- 1 John & Margie Hawkins
- 6 Jim & Barbara McHugh
- 31 Bob & Margaret Heinek

## September Birthdays

- 7 Janet Pellus
- 17 Ruth Amos
- 21 Marsha Miller
- 21 Tom Fields
- 25 Ashley Diane Miller

## Anniversaries

- 1 Tom & Pat McLaughlin
- 9 Herb & Phyllis Luckert

## MINUTES OF THE MAY MEETING

President Don Church opened the May 19, 2002, meeting of the Michiana Gem & Mineral Society at 2 p.m.

Refreshments were provided by Addie Niebauer, Bess Wise and Herb and Phyllis Luckert.

A motion to accept the minutes of the April meeting as printed in *The Rockfinder* was seconded and approved. Bob Heinek gave the treasurer's report from March to May. The report will be filed for audit. Kathy Miller gave a report on the field trip to be held this fall; there are 3 rooms at the motel and 6 seats on the bus left.

Tom Noe had suggested in March we might have a table at University Park Mall before our Labor Day show, so he called for information, to be presented to the members of the club. Since Tom was on vacation, Phyllis Luckert gave the report on what it will cost. The mall said they require \$2,000,000 insurance and rent of \$200 for 2 tables for the one day. Our society carries the MWF insurance, which is \$1,000,000, so Margaret will call to see if this would be enough. If so, the members voted to have the display. Tom Noe will be in charge of this, and many hands went up to say they would work at the tables.

Don Church will serve as delegate for the club to the MWF convention. We have 1 new member; Joseph Perry, who became a member as of March 29. Welcome.

Tom McLaughlin asked if he could purchase a small coffeepot for the hostesses to use each month, motioned, seconded and approved.

Bob Heinek gave a Labor Day show report. We are waiting for contracts to be returned from two of the dealers, and then we will be full. Margaret reported on chairmen for the volunteer activities: Tom Noe: Silent Auction; Kathy Miller, admissions and door; Bob Miller, demonstrators; Pat and Ed Enos, Kiddie Korner. We need someone to take care of contacting members for displays. Who will do this? All will need help, so call and offer your time where you want to work. We need members to be at Century Center on Friday at 8 a.m. to help cover display tables.

Two video programs were shown: *The*

*Unwritten Record, Archeology of Illinois.* Also *The Great Floods* that took place in Washington and Oregon. Both were very interesting.

There will be no meeting in June, unless someone knows where the members could go for the day to hunt.

A photo was taken of all of the mothers present and each was given a pendant, made by Bob Heinek.

Margaret Heinek, acting secretary

## GET READY FOR THE CLUB'S FALL SHOW AT CENTURY CENTER

This year, the club's annual show is scheduled for Labor Day Weekend, August 30, 31 and September 1, at Century Center in downtown South Bend. This is our big annual fundraiser, and we hope that all the club members can help out with some of the many things that need to be done.

What can you do?

1) Make some displays. Put together a display case with some of your recent finds or put some old finds together in a new way. Margaret Heinek is organizing all the displays, so contact her (574-654-3673 or marheinek@aol.com) once you know how big your display will be. Then she can order the appropriate number of tables.

2) Help out at the entrance table. Contact Kathy Miller (574-291-0332 or kanbrock@aol.com) to volunteer to sit at the entrance table and sell tickets, greet patrons and answer questions about the Michiana Gem & Mineral Society.

3) Help out at the silent auction. Contact Tom Noe (574-289-2028 or toaf@bigfoot.com) if you can spend a few hours staffing the table, taking money, getting items ready for auction, etc.

4) Donate or consign items to the silent auction. All the money we collect on donated items goes into the club treasury. On consigned items, the owner keeps

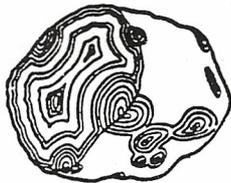
a percentage of the proceeds. Items should be geology or lapidary-related: tools, rough, cabs, fossils, etc. Contact Tom Noe (see above) to discuss donations or consignments.

5) Help out at the Kiddies Korner. We need several people to staff this area of games and activities for young people. This is always lots of fun for everybody. Contact Ed and Pat Enos (574-293-7965) to volunteer.

6) Help pick up or return items that we need to move from the club's storage shed in New Carlisle. Pick up on Thursday night; return on Sunday after the show ends. Do you have a van or pickup truck? Call Don Church (616-651-7616 or donchurch@inetplus.net to volunteer.

All volunteers should contact the appropriate person well in advance so that you can be scheduled in for a few hours on the Friday (2 p.m. to 7 p.m.), Saturday (10 a.m. to 6 p.m.) or Sunday (10 a.m. to 4 p.m.) of the show.

Our annual show is ALL volunteer-run (this means you), so your help is important! The club is counting on you.



## **JOIN THE CLUB AT UNIVERSITY PARK MALL AUGUST 10**

On Saturday, August 10, members of the Michiana Gem & Mineral Society will gather at University Park Mall, in the area right in front of the L.S. Ayres store. We will display and talk about lapidary and fossil materials, and also promote the club and our annual Century Center show at the end of August.

Hours at the mall are from 10 in the morning till 9 at night. It would be great if we could have members scheduled there the whole time on a rotating basis.

The set-up will be similar to the one we use at Science Alive every year. We have rented two eight-foot tables to hold displays of minerals, gems, jewelry

and fossils. These displays will show people what we do as a club. Some will be items that people can handle (including dino poop, always a favorite with the kids). We will also have simple games for kids, plus handouts for kids and adults.

We will be able to sign up new members, sign up people for the show mailing list, hand out flyers and discount coupons for the show, etc. The most important thing is just to have members sitting there who can talk about the club and our activities. It would be great to have some of our junior members there too, since there should be lots of young people interested in the displays and wanting to talk about rocks.

It's a simple plan, but it should publicize the club and bring in more people for the show later that month.

The mall is providing only six chairs, so it will be best to schedule people to show up for a few hours at various times throughout the day. If you signed up at the last meeting, you have already been contacted. If you want to come but did not sign up, contact Tom Noe (toaf@bigfoot.com or 289-2028) to sign up for a specific time. (You may need to bring your own folding chair.)

When you come, feel free to bring some of your own personal items for display: fossils and minerals you have found, jewelry you have made. You could keep them in a small case if you don't want people to handle them. Recommended items: flashy, bright items like quartz crystal clusters, colorful mineral specimens, showy petrified wood, jewelry (pieces you have made or the type that will be available at the show), good-looking fossils (especially dinosaurs; most of these people will not even know that private individuals can own dinosaur bones). Bring whatever interests you; it will also be interesting to someone at the mall. Also, wear belt buckles or jewelry that has stones; this is another way to display.

NOTE: large display cases cannot be carried through the mall (on handcarts, for example) during working hours. So, any cases have to be small, something that one person can carry. If you need help carrying something, let Tom know ahead of time.

So, to summarize: come to the mall; bring something to display, and call Tom to make arrangements.

## LINNAEUS AND THE CLASSIFICATION OF ROCKS

By Sam Shapiro

Most of us are familiar with the system of classifying plants and animals created by Linnaeus (*Systema Naturae*, 1735). Our friend the dog is in the kingdom *animalia*, phylum *chordata*, class *mammalia*, order *carnivora* and is known by the species name *Canis Familiaris*. This plan worked well and is in use today.

However, its success led Linnaeus to attempt to classify minerals in the same binomial system. In the 1748 edition of his book, for example, he distinguished between *Quartzum Aqueum* (transparent quartz), white quartz, colored quartz and opaque quartz. What worked in biology was misleading when applied to the mineral world. These so-called species had no logical coherence. One example of a mineral might be half a billion years old, from ancient cooling magma; another might come from a bomb crater in Nevada. It became obvious that minerals must be classified by their own rules of composition. Linnaeus's geological scheme was speedily abandoned.

(Ref. an article in Stephen J. Gould's last collection of essays, *I Have Landed*. The great Harvard paleontologist died this year, at age 60.)

## CORAL FORESTS IN ALASKAN WATERS

Deep within Alaska's frigid waters, divers discovered a valuable resource, Alaskan coral. Roger Pike, a former Alaska jade shop owner and fisherman, retrieved sufficient quantities of coral to produce a new and genuine line of precious stone jewelry from Alaska.

The coral fresh from the sea is brilliant pink and remarkably heavy in its natural state. After being cleaned and polished, the coral produces a hard stone which shimmers in mottled greens, blue, yellow, brown and black.

A yearlong search involved underwater television cameras and divers were responsible for the eventual discovery of the extensive coral forests.

*Breccia* (June, 1998)



## THE GEOLOGIST'S LAMENT

By R. L. Frism

Gather 'round me, hear my story,  
I'm a rockhound in distress;  
I'm a rockhound bathed in troubles,  
I'm an outcast, more or less.  
I have fossils in the kitchen,  
I have crystals in the hall,  
I have min'rals in the bathtub,  
I have relics on the walls.  
I have oxides on the carpet,  
I have oil upon the floor;  
I have black light in the parlor;  
I have bones behind each door.  
Attic rooms are fairly sagging;  
Flat rocks pave the cellar floor.  
Pockets bulge with gemmy pieces,  
All of this and millions more.  
Wifey thinks that I am goofy;  
I don't know; she may be right;  
She insists I've silicosis  
Or some horrid form of "ite."  
Says my head is lined with agate  
(Freak replacement of the bone);  
Claims my brain is just a nodule,  
Says my heart has turned to stone.  
Threatens me with separation;  
Storms about our rock-lined home;  
Says my life is just a geode  
Or a hunk of mammal bone.  
Are you rated as a fossil?  
Or obliged to live alone?  
How can you maintain a hobby,  
And still have a happy home?

*The Lodestone* (1940)

## THE LAPORTE COUNTY MASTODON DIG

The remains of a 13,000-year-old male mastodon with a 4-foot-long skull and 9-foot-long tusks were unearthed on the Richard Gumz farm in LaPorte County, Indiana. The remains were discovered by farmhands digging a drainage ditch two years ago (April, 1998). The skull, jaws and tusks were removed immediately after the discovery, but the remaining bones were not excavated until August, 2000. Heading the recovery effort was Ron Richards, Chief Curator of Natural History at the Indiana State Museum.

Ron and many volunteers have unearthed close to six mastodons and a mammoth over the last 20 years from the soil of Indiana. The Gumz mastodon was the first, however, that had an intact skull. Unfortunately the skull had been damaged during recovery, as was one of the tusks.

The mastodon was found standing upright, and probably had been caught in a bog. While the animal's feet were found along with shoulders, hips, kneecaps, vertebrae and ribs, its twelve leg bones were missing. A rib or two were broken and a few showed signs of being gnawed on by scavengers.

The drainage ditch in which the bones were buried was four feet deep, ten feet wide and full of water and muck. Mapping the location of the bones during the April, 1998, recovery trip was difficult due to the weather and water. However, this was just an inconvenience for these experienced "bone collectors."

During the August, 2000, dig the water was removed from the ditch by way of dams, bypass pumps, four forty-foot-deep wells and lots of channeling. Very little was found in the ditch's channel. Most of the bones were buried in the bank between the marsh clay (greenish clay) and the lake clay (gray clay) layers. When first uncovered, the bones appeared to be orange/red in color, but after exposure to the air they turned dark brown. While buried in the earth, the marsh clay (greenish clay) protected the bones from the oxygen in the soil.

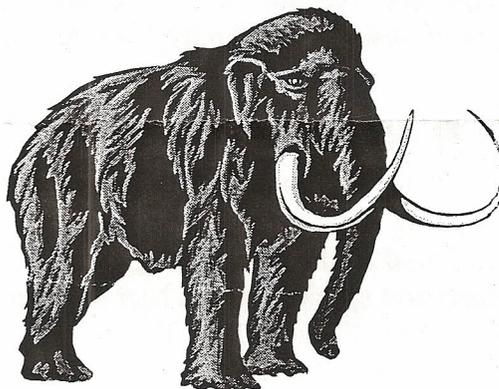
The bones of fish (i.e., northern pike), turtles, frogs and small mastodons were also found. The

remains of white and black spruce trees indicated that this area was once a conifer forest.

The bones were carefully excavated through the use of heavy machinery (to remove the topsoil layer), shovels, trowels, spades, wooden digging tools (to prevent scarring of the bones) and dustpans. Almost all the work required many hours on hands and knees. Volunteers using high-powered hoses and two types of screens screened the soil that was removed from the bone field. All the soil was hand carried from the "bone pit" to the screens in buckets labeled according to the location of its removal.

Almost all of the mastodon's bones were recovered. Missing were two or three vertebrae, eight ribs and twelve leg bones. A full mounted cast of the LaPorte mastodon, in a lifelike position, will be displayed in the new Indiana State Museum.

*The Calumet Gem* (Mar., 2001)



Digging a new subway line through Hollywood into the San Fernando Valley brought up a total of 2,000 fossils since 1987. Many represent new species, and span the past 16 million years. Most interestingly, marine fossils from about 8 million years ago indicate that Los Angeles was under water then.

*Science News* (Dec. 23, 2000)

## SCIENCE NEWS: EGGS HOLD BABIES OF GIANT DINOSAURS

Washington, Sept. 27

In a nesting area once used by hundreds of generations of dinosaurs, researchers have found a clutch of unhatched babies that come from the last and most massive family of long-necked, plant-eating sauropods.

Louis Chiappe, first author of a study appearing in Friday's issue of the journal *Science*, said the baby dinosaurs drowned in their eggs just before hatching when a river flooded 80 million years ago in what is now the Patagonia region of Argentina.

Chiappe, chairman of the Department of Vertebrate Paleontology at the Natural History Museum of Los Angeles County, said the dinosaur nesting area was discovered in 1997, but researchers only now have identified the types of animals that used it as a nursery. He said the embryos are from a sauropod type of dinosaur in a family group known as titanosaurs.

A member of this family group, *argentinosauros*, lived 90 million years ago and is thought to be the largest animal ever to walk the Earth—120 feet long and weighing more than 80 tons. Chiappe said the embryos found in the drowned eggs are from a previously unknown species that is a later and smaller member of the same titanosaur family.

"We have found hundreds of nests" in an area known as Auca Mahuida, said Chiappe. "Sauropods gathered in great numbers—by the hundreds of thousands—to nest at this site. They returned to this site time after time."

### Classic Dinosaur

Sauropods had small heads atop long necks. The massive body ended with a muscular tail. The animals foraged from tree tops, are thought to have lived in herds and were among the most successful of the dinosaurs, appearing in fossil records of nearly every continent starting almost 200 million years ago. *Brontosaurus*, now known as *Apatosaurus*, is probably the most famous of the sauropods because it once was the symbol of an oil company.

Chiappe said the dinosaurs apparently dug holes, laid their eggs in irregular clusters, often with

two or three layers on top of each other. They then mounded the nests with vegetation, he said, and abandoned the nests.

"They preferred to lay their eggs on the flood plain, but not close to river channels," he said. The fossilized eggs prove that the animals could misjudge the river. At least four times, he said, the nests were flooded, drowning the young in their shells and burying them in mud. The mud preserved and fossilized the eggs and the embryos.

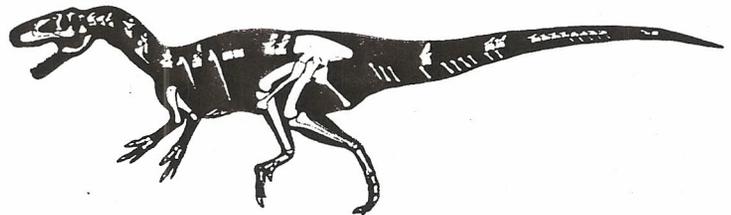
### Softball-Sized Eggs

Chiappe said the eggs were about the size of softballs, and the six baby dinos analyzed were about a foot long. Fossil fragments of adults from the same species, found nearby, suggest that when fully grown the babies would be about 50 feet long.

The six baby dinos have the most complete skulls of any titanosaur yet discovered, a fact that Chiappe called ironic.

"The best preserved skulls of this large group of long-necked dinosaurs come from embryonic remains which are among the rarest of all dinosaur fossils," he said.

*The Chiseler* (Nov., 2001)



### GOLD PROSPECTING

Marquette company hopes interest in gold prospecting will pan out.

MARQUETTE, Michigan - There may never be another gold rush in the Upper Peninsula, but Sherry Goodreau would settle for a steady stream of paying prospectors. "It's a great way to spend a nice afternoon, and maybe find something valuable," said Goodreau, a part-owner of Treasure Treks Outfitters of Marquette. "Once it gets in your blood, it's hard to get rid of it."

Treasure Treks hopes to rekindle interest in

Upper Peninsula gold prospecting—not in the mines that flourished from about 1880 to the early 1900s but through stream and riverbank panning. Goodreau tried her luck recently in Reany Creek in Marquette Township. She dipped a Frisbee-like plastic pan into the creek bed, pulled up water and a little sand and gravel, then swirled the mixture around and around until a few tiny gold flecks appeared.

“You have to know where to look, but it’s there,” Goodreau told *The Mining Journal*. “You have to have patience and a little bit of knowledge.” Gold can sometimes be found between cracks and crevices along Reany Creek and dozens of other Upper Peninsula streams, said Goodreau’s business partner, Dan Lumpford.

“A lot of people don’t know it, but the U.P. has been known for years as an area where you could find gold,” he said. “It’s a proud tradition up here.” The existence of gold in Michigan was first mentioned in 1837 by Professor Douglass Houghton, the first state geologist, whose 1841 report on the state’s mineral resources also listed copper and iron ore. Gold didn’t secure a place in the state’s history until the Ropes Gold Mine opened in the early 1880s.

According to “Michigan Gold: Mining in the Upper Peninsula” by Ishpeming author Daniel Fountain, the Ropes mine produced \$645,792 worth of gold and silver over 14 years. In subsequent years, more than 40 other gold mines and prospects were begun in the Upper Peninsula, according to Fountain.

Some mines yielded rich specimens of gold-bearing quartz. Other prospects amounted to just a few trenches and pits, and played out after producing only traces of gold. Most prospecting had ended by the early 1900s, Fountain wrote.

Improved metallurgical methods, coupled with high gold prices, allowed the Rope Mine to go back into production in 1985. It reclosed four years later, the victim of falling prices, poor ore grade and a collapse of rock in the production shaft, according to Fountain.

Article suggested by Millie Hurt from *The Daily Mining Gazette*

*The Conglomerate* (Sept., 2001)

## ROCK DUST PUT TO GOOD USE

by Ed Montgomery

Before coal tars and synthetics, painters pounded cinnabar to make the pigment for a brilliant red and pounded malachite to get a brilliant green. With azurite you could get a blue, but the best and most brilliant blue was made from lapis lazuli.

Lapis is a rock, not a mineral, and was often called “ultramarine” blue because it came to Europe from “far across the sea.”

Azurite was the major source of blue pigment for painters in the Middle Ages, though it was often labeled as lapis. When it loses its water, azurite turns black. If it deteriorates into its copper carbonate cousin, malachite, it turns green. These unfortunate facts of chemistry have given unwanted black and green blotches to a number of old paintings.

In its original rock lump form, lapis doesn’t show its eventual richness of blue. You have to work it. First, grind into a powder. Separately, make a paste of wax, oil and resin, and sprinkle in the powder. Work together like dough. Into a container of warm lye, place the clump, work and squeeze it till the liquid can absorb no more blue. Place into another bowl of lye and keep repeating until all blue is squeezed out. Let these liquids stand till evaporated. What’s left is, again, powder; but impurities must be removed. So, wash, skim and strain about twenty times. Eventually the artist could mix the finished powder into oil and begin to paint.

While lapis lazuli could retain its color even when finely ground, malachite and azurite would lose color. Only through trial-and-error experience would the painter get the optimum compromise of coarse enough for color and fine enough to be brushable.

Source: Anderson, *Riches of the Earth*  
*The Pegmatite* (Sept., 2001)



## NO HARD TIMES IN SIGHT FOR LIMESTONE BUSINESS

When harvesting limestone in Thornton, IL, began in the 1830s, the technology of excavation involved moving rocks uphill in carts pulled by teams of donkeys. More than 160 years later, the hole, started under what is now the Tri-State Tollway, has evolved into one of the world's largest commercial limestone quarries.

In 1938, Sol Crown's Material Service Corp. purchased the plant from Moulding-Brownell after it went bankrupt. Today, plant officials say Crown's descendant, Lester Crown, owns a thriving business.

Each hour, about 2,600 tons of stone are processed into 40 different limestone products at the plant, said Jay Morriss. Mining is expected to continue for another 60 to 70 years.

"To some degree, everything made out of concrete or blocks is made out of one of these products," said Morriss, who noted many buildings in the Chicago area are made up of Thornton rock, which is also sold in high volumes outside the state.

"The quality is so good, and the sulfur content is so low that it's better for them to ship it from here than to mine it on that side of the lake," he said.

As a recent tour bus proceeded into the quarry, Morriss pointed to a towering pile of 2-inch rocks popular with the railroads. He said it is spread underneath tracks for a base layer.

Another big seller is Grade 8, rock or "Indiana 8," which is about an inch and a half in diameter. The product is most commonly used below roads where there is not considerable water runoff. Pourable concrete is usually made from yet another product called B Binder, which is smaller than the tip of one's pinkie finger.

The stone is sold for \$5 to \$12 a ton, depending on the type of product, Morriss said.

At the heart of the entire mining operation is a rare, pre-World War II-era machine. The primary crusher, located in the center of the quarry, is made of manganese steel, and its replacement parts can be purchased only from a business in South Africa. Morriss said it has run almost continuously from the

first week in February until Christmas, every year since it was installed in 1930.

An arm inside the crusher swings in a circle and breaks rock down to the size of a basketball. The rock is loaded on conveyors, which take it up to a mill at surface level where it goes through a series of shakers and crushers. The rock is then sorted by size through filters and sold.

Stone is blasted from the wall once or twice daily. Instead of detonating all of the explosives at once, workers set off a series of staggered blasts.

"There may be 30 different holes," Morriss said. "That way it doesn't affect the neighbors so much."

While explosives are being detonated, workers are restricted from entering the tunnels because a stone or two will usually fall, Morriss said. Emergency lights flash prior to detonations as a safety precaution.

As the bus rolled along, Morriss pointed out tall stone plates, called armor stones, which line the right side of the road. He said the stones have prevented a few trucks from plunging over the edge of the road and further down into the 400-foot-deep quarry.

"The mining industry in America is the most plagued with injuries and fatalities," Morriss said. "Here we're surprisingly accident free."

To keep accidents to a minimum, the business employs a safety department to consider suggestions about how to eliminate dangers. Even when proper safety precautions are followed, though, accidents sometimes happen.

As the bus approached a gate where trucks load up with rock and drivers pay for it by the ton, Morriss recalled a day when the driver of a small truck pulled up to buy a ton and made a costly mistake. Instead of pushing the button for 1 ton of rock, the driver pushed the button for 25 tons. The truck's windows and mirrors were destroyed by the pile of limestone, but no one was hurt. He said, "The worst of it is, I borrowed this truck," Morriss said.

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