THE ROCKFINDER

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

SOUTH BEND IN PM OCT 17 2002

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MICHIANA GEM & MINERAL SOCIETY, INC.

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THE ROCKFINDER

OCTOBER, 2002

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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)
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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.

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.

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THE ROCKFINDER

Newsletter of the Michiana Gem & Mineral Society

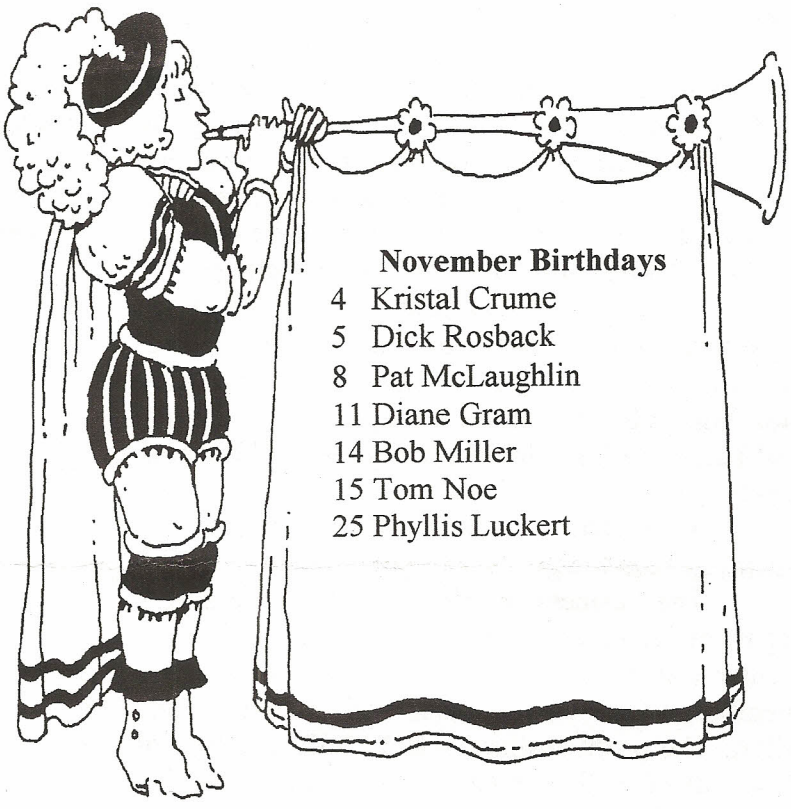
Volume 42, Number 8 **October, 2002**

Meeting: Sunday, October 27, 2002
Doors open at 1:30 p.m.
Meeting starts at 2:00 p.m.

Place: Our Redeemer Lutheran Church
805 S. 29th St. (19th & Wall)
South Bend, IN

Program: NOMINATION OF OFFICERS;
Bob and Kathy Miller will describe some of their recent rockhounding adventures in Montana (looking for sapphires), the badlands, Judith River Mountains, etc. There will also be some nice geodes which members picked up on the field trip.

Refreshments: Sr. Jeanne Finske, Patty Enos



November Birthdays
4 Kristal Crume
5 Dick Rosback
8 Pat McLaughlin
11 Diane Gram
14 Bob Miller
15 Tom Noe
25 Phyllis Luckert

UP AND COMING

Oct. 18-20: Three Rivers Club show, Allen County Fairgrounds, Fort Wayne, IN.
Oct. 11-13: Greater Detroit Gem & Mineral Show, South Macomb Community College, Warren, MI.
Oct. 19-20: South Suburban Earth Science Club show, Prairie State College, Chicago Heights, IL.
Oct. 19-20: Flint Rock Club show, Carter Middle School, Clio, MI.
Oct. 25-27: Central Michigan Lapidary show, Ingham County Fairgrounds, Mason, MI.
Oct. 26-27: Evansville Lapidary Society show, Washington Square Mall, Evansville, IN.

MINUTES OF SEPTEMBER 22 MEETING

The meeting was called to order at 2:05 by Don Church, president. Those in attendance included 28 members, four junior members and two guests. It was decided to have the program part of the meeting first, since several members had to leave early.

The program consisted of a presentation of other hobbies of members. These included woodworking by Herbert Luckert; coin collecting by Kent Hoffman; genealogy, doll refurbishing and scrapbooking by Margaret Heinek; picture postcard collecting by Robert Konrath; pallet-wood bird and butterfly houses, bird feeders and seagulls (which were later given as door prizes) by Don Church; bead-making from paper by Kathy Miller; woodcarving and glass and copper-wire designing by Bob Miller; Fimo sculptures (finger puppets, fossils and beads) by Bob Heinek; honeybees and beeswax candles by Bill Nelson and Emily Johnson-Nelson; and book collecting, gardening, reading and reciting poetry by Sam Shapiro.

The business meeting included a treasurer's report by Bob Heinek. The annual show at Century Center was a success due to the hard work of the members who were generous with their time and effort. The profit realized was $1,867. The lack of food service at the center posed a problem for displayers and volunteer workers. There was a discussion about this which resulted in a recommendation that the club try to use its influence to remedy the situation before next year's show. Tom Noe thanked the members for bringing rocks for the Silent Auction. He also reported that the publicity table at U.P. Mall was not a success, and recommended that we not do it again because of the cost. It brought very few new people to the show.

Continuing old business, Kathy Miller gave handouts to members who will be going on the October field trip to Keokuk, IA. Members were informed that the motel will not accept personal checks. They were reminded to bring a clean pair of shoes to put on after the rock-gathering.

Under new business, it was announced that the October meeting would be in the upstairs room because the church will be having a Halloween party in the lower level. Members were reminded that the November meeting is omitted because we include a meeting at the Christmas party early in December.

Door prizes were awarded to Sam Shapiro, Robert Heinek, Emily Johnson-Nelson, Janus Horrall, Lana Wright, Annitta Hostetler and David Peltz. The junior members were each given one of Kathy's necklaces.

Delicious and nutritious refreshments were supplied and served by Emily Johnson-Nelson, Bill Nelson and Bob Conrath. They were assisted by Tom McLaughlin, who made the coffee.

The meeting adjourned at 3:30 p.m.

--M. Jeanne Finske, Secretary

BOILING WATER MAKES ROCKS

By Ed Montgomery, American Opal Society

Water is a solvent if it is hot enough or acidic enough. In the acid scenario, rainwater meets carbon dioxide, seeps down, encounters sulfides and, bingo, sulfuric acid.

This liquid roams and dissolves minerals and puts mineral substances in motion to travel and interact with other substances. Malachite is formed this way. The bumps on turquoise indicate dissolved minerals flowing in cool water.

In the hot water scenario, rainwater seeps into the ground and goes deep enough to be heated by magma or already boiling water. Now heated, this water moves back up by a process of steam and condensation--dissolving minerals and redepositing their constituents along the way. Cooled, the water sinks, encounters again the heat source, moves upward, repeats the dissolving and depositing. This repetition gives agate its layered look. Amethyst crystals can form once the silica content of the water thins out sufficiently.

Perhaps the oldest, certainly for jewelers the most fortuitous, case of raindrop to rock is the formation of opal, in yet another scenario.

In a dry desert area, the rainwater goes down through permeable rocks rich in silica. The downgoing water carries silica to the underground water table, raising it. Being raised., it spreads out to fill fissures and such. The rain stops, the dry desert eventually drops the water table down by evaporation, but the ledges and fissures are left high, and not completely dry. Within these fissures, the silica-rich water gets richer by evaporation. When the silica-to-water ratio is just right, spheres form (bubbles). These spheres are what make opal opal. With further evaporation, the spheres become gelatinous, eventually harden and, like adding ball bearings to a cup, they layer the cavity in an orderly fashion. Water is trapped between the spheres.

The orderly arrangement of the spheres diffracts light (segments it and moves it around). This light movement, in combination with the varying amount of water inclusions, gives the light play of precious opal. Water here acts as a sort of music to the spheres.

Yes, water is a solvent. Find enough opal and many of your financial problems will be solved.

Ref.: *Gemstones and Their Origins*, by Peter C. Keller
from *The Opal Express* (Feb., 2000)

THE CALIFORNIA GOLD RUSH: DISCOVERY

By Sam Shapiro

John Augustus Sutter left his native Switzerland in 1834 to escape creditors. He traveled from New York to the Missouri frontier, then set up a principality named New Helvetia, 75 miles west of the hamlet of San Francisco (population 850). His land grants from Mexico (225 square miles) gave him the power to judge, jail and execute criminals, perform weddings and funerals, and sell parcels of land. "I had power of life and death over both whites and criminals," he later bragged. Hundreds of Indians and a trickle of Americans worked in his various enterprises.

In 1847 Sutter hired James Marshall to build a sawmill on the American River from the primeval oak, ash, pine and fir that grew in the foothills. After com-pleting the mill, Marshall and his Indian laborers were deepening the tailrace, where water ran out of the mill back into the river. On the morning of January 24, 1848, millions of years of geological history intersected with a crucial event in the history of California and the United States. Marshall later told the story:

". . . about half past seven . . . I went down as usual, and after shutting off the water from the race, I stepped into it . . . and there, about six inches beneath the surface of the water, I discovered the gold. . . . I picked up one or two pieces. . . . They resembled sulphuret of iron ['fool's gold,' which the MGMS brought back from our field trip to Michigan], very bright and brittle, and gold, bright, yet malleable. I then tried it between two rocks and found it could be beaten into a different shape, but could not be broken."

Four days later, at Sutter's Fort, where the American River flows into the Sacramento, Marshall and Sutter convinced themselves that the dust, flakes and nuggets Marshall had found were indeed gold. On May 8, 1848, a Mormon elder named Sam Brannan stepped off the San Francisco wharf, waving a bottle aloft and shouting: "Gold! Gold from the American River!"

The Great Gold Rush had begun.

THE FOOTPRINT OF A GIANT

From USGS

The only undisputed fossilized footprint of a *Tyrannosaurus rex* dinosaur is in North Ponil Canyon on the Philmont Scout Ranch near Cimarron, New Mexico. The track, made by the dinosaur's left hind foot, was discovered in northeastern New Mexico in 1983 by Charles Pillmore, a research geologist with the U.S. Geological Survey in Denver, Colorado. It was identified 10 years later as a footprint made by the giant *T. rex*, and presently is recognized as the only known fossilized track made by the creature. Although several nearly complete fossil skeletons of the large dinosaur have been found, until 1993 no tracks attributable to this creature had been reported.

Discovery: Pillmore recalls chancing upon the track while he was mapping geology and tracing the K/T boundary in North Ponil Canyon. He noticed an unusual shape on a large block of sandstone, a short distance above the creek, and observed that it resembled the footprint of a large three-toed animal, probably a dinosaur. The block appeared to have fallen from a ledge higher up on the slope, and to have rotated as it moved down the hill so that the bottom of the block now faces upward. He noted the discovery in his field notebook and took some samples of the sandstone, but didn't suspect it was anything particularly unusual.

Identification: Several years later Pillmore showed pictures of the Philmont track to Dr. Martin Lockley, a dinosaur track specialist at the University of Colorado at Denver. Lockley agreed that it was the footprint of a dinosaur, and proposed that the animal that made the track was probably a large hadrosaur. He agreed to accompany Pillmore to the Philmont site and confirm the identification. In late summer of 1993 the two men made the trip to New Mexico to examine and make a mold of the track. As they began to clear away the leaves and dirt that partly covered the track, Lockley noted that it was too big for a hadrosaur, and that its heel was much larger than any hadrosaur heel he could recall. He then noticed a distinctive shape on the side of the track, and speculated that it might have been made by a fourth digit called a hallus. (Editor's note: a hallus as described in *Webster's* is "the innermost digit (as the big toe) of a hind or lower limb.") He then proposed that the size and shape of the track and the presence of the fourth digit were convincing evidence that they were looking at possibly the first *Tyrannosaurus rex* track ever seen. After sketching an outline of the track on clear plastic, the scientists made a latex mold of the track.

Position in the rocks: Dr Farley Fleming, then a USGS fossil pollen specialist, helped to establish the relative age and stratigraphic positon of the track layer. He determined that the track was made in late Cretaceous time, 65-70 million years ago, the proper age for a *T. rex*, and that the dinosaur was walking across a vegetated wetland mudflat dominated by palm trees and ferns.

Significance: The discovery of the natural cast of the *T. rex* provided much important information: (1) the shape of the bottom of the dinosaur's foot contributes to knowledge of the soft tissue and the probable muscle structure of the foot, and how it supported the animal's great weight; (2) the position of the hallus on the foot is apparent in the footprint. The track indicates that the hallus was fairly high on the foot, and well back on the heel, which could assist in skeletal reconstruction; (3) the presence of claw marks suggest the foot had large claws, which may indicate a predatory way of life; (4) the range of the *T. rex* is extended south about 250 miles from the nearest known occurrence to the north; and (5) 65-70 million years ago, *T. rex* roamed across a broad river floodplain in a subtropical wetlands environment, as indicated by palm leaves and other fossils in rocks nearby, and by fossil palm pollen and fern spores noted in samples of the muds he/she walked in.

Preservation: A number of circumstances occurred that enabled the *T. rex* track to be preserved. First, the mud that the dinosaur was walking across had to be of a particular consistency and character—firm enough

to preserve the shape of the foot, but not so soft or fluid as to allow mud to flow back into the cavity, destroying the footprint. Second, the footprint had to remain open until a nearby river flooded and sand-laden water flowed across the mudflat, filling the footprint and depositing a three- to five-foot layer of sand on the mud surface. The flood current had to be strong enough to carry the sand sediment that filled the footprint, yet gentle enough not to wash away the mud containing the track. This sand layer was later covered by several thousand feet of ridges that we see today.

Vital statistics: The footprint on the rock is 33 inches long by 28 inches wide. The depth of the infilling was about nine inches. Lockley determined from its position on the block that the animal's stride was at least nine feet. He estimated, from the size of the footprint and the stride of the animal, that it was probably moving at least six to seven miles per hour. When mature, *T. rex* reached a length of about 60 feet, stood nearly two stories tall, and weighed approximately 8,000-12,000 pounds.

Official name: In 1994 a paper proposing the name *Tyrannosauripus pilomorei* for this track was submitted by Lockley and associate Adrian Hunt to honor Pillmore's discovery. The paper was published later that year in *Ichnos* (volume 3, pp. 213-218), an international journal for plant and animal traces, assuring that the name will be an official part of the scientific record.

The Obsidian Observer (Oct., 2001)

CRACKS TO FILL?

(A lapidary tip from The Rockhound List (rockhoundslist@yahoogroups.com)

Here's a tip that may come in handy for a lot of lapidary people.

I had a patent on a method of setting gem chips in the 1970s and it would also be handy for use on thin profiled gem slices, and there are still some patents covering certain aspects of this method.

First of all, you need to profile your gem slice to the required size, say 25 x 18 mm. Polish the edges, or sand them to the finish required.

You will need a source of two-part clear epoxy resin suitable for heat curing. The next thing you need is a dust-free environment and a means of keeping the temperature at about 160 F. for the required setting time of the resin. A helpful tip is to pour a small amount of resin onto a small area of release paper to test to see if the resin is cured—check with a matchstick by touching the surface.

When you mix the two parts of the resin (the dealer should know a curing time and a working time) place your preformed slice of gemstone onto a warmed surface (not too hot). The resin should run to the edges of your gem and hold a convex meniscus (dome—depending on the viscosity of the resin). Air bubbles may be removed by flaming with a blow torch on low pressure. If the cracks are deep, you may need to repeat the process, so keep an eye on the resin to see if air continues to escape.

Allow the resin to set and then allow a 48-hour period before handling the gem. The resin may be brittle if you handle it too soon, or if the resin is not cured correctly you may find fingerprints embedded on the surface.

Note: Certain aspects of this process are still covered by patents, and will be for about 16 years, but we have no objection to fellow enthusiasts using this process for coating gemstones. If you wish to use this process on your gemstones, minerals or fossils, please keep a complete copy of the e-mail for future reference.

Editor Ed's Note: Note the idea of using a torch flame to release air bubbles from the setting epoxy. Most of us don't have the vacuum source often recommended. Here's a possible much less expensive and simpler procedure—and I have to believe that a handy-dandy propane torch would do the job just as well as a blow torch.

Arrowhead News (Jan., 2002)

THE GREATEST AMERICAN MINERAL LOCALITY?

By Dana Slaughter

The Tsumeb mine at Tsumeb, Namibia, is generally acknowledged as the world's premier specimen locality, and many would probably put the Ojuela mine at Mapimi, Mexico, in second position. Discussion of the world's greatest mineral localities is beyond the scope of this article, yet we can certainly agree to disagree when choosing America's greatest mineral locality. As a matter of necessity, we are obliged to consider mining districts as well as individual mines. Bisbee, AZ, is one of the world's greatest mineral localities, but it is more than a single mine and is part of the Warren mining district. Franklin and Sterling Hill, NJ, are inseparable in discussion, though are separate ore bodies. The great Tri-State district (the confluence of Kansas, Missouri and Oklahoma) hosted scores of mines, as did the Lake Superior copper district. Further, what criteria must this mine, or district, meet to be considered America's greatest?

Foremost, it's the minerals, with emphasis on the plural! The Red Cloud mine is known almost exclusively for its wulfenite, and the Sweet Home mine for rhodochrosite. They're out of contention by this virtue alone. Our subject must have supplied the market with several species, many of which must be desirable. Desirability is another factor. The collecting community is not exactly beating down the doors to get Franklin mcgovernite, or Quincy mine epidote. For our purposes, we shall consider foremost the aesthetics of the species. Necessarily, we'll drop Franklin/Sterling Hill, and Crestmore, CA, from consideration, despite the incredible diversity of their respective mineralogies. Production is another important factor. Our locality must have a history of producing fantastic specimens over time. Certainly Bisbee, Tri-State and the Michigan copper mines each produced enormous amounts of fine specimens for collectors over a lengthy period. Though all closed now, the fact that fine specimens from these localities are still available on the market is testimony to the sheer tonnage produced. What then, is America's greatest mineral locality?

The Cave-in-Rock mining district in southern Illinois is America's greatest mineral locality. Composed of many mines, and covering many square miles, the mines of the southern Illinois fluorite mining district produced countless fine specimens for the collector over a period of several decades. By convention, these mines are generally considered as part of a single mining district, though, strictly speaking, they are composed of several distinct districts. Perhaps most notable among the mines are the Annabel Lee, the Denton and the Minerva No. 1 /Ozark-Mahoning No. 1 mines. The mines of southern Illinois, and to a far lesser extent western Kentucky, produced incredible quantities of world-class barite, calcite, fluorite, galena, witherite, and lesser quantities of fine benstonite, sphalerite and strontianite.

Without doubt, fluorite is the most desirable mineral, and no collection is complete without at least one good Illinois fluorite. Fortunately, hundreds of thousands of specimens were saved from the crushers. It was not uncommon for local miners to have chicken houses and sheds full of variously colored fluorite. Purple (or grape) is the most common color, but it has been found as colorless, blue, green (rare), pink (rare), or yellow, and in almost every conceivable hue and tint. Most prized are the blue and yellow crystals, sometimes sporting very distinct and striking phantoms and/or color zoning. Crystals are predominantly simple cubes, though are sometimes distorted or modified. Crystals to over 10 cm. are known, though most are under 10 cm. Frequently associated with the fluorite are wondrous calcite or galena crystals. Vivid yellow-orange fluorite groups rimmed with sparkling calcite crystals, or violet fluorite crystals studded with bright galena crystals, are among the most sought-after specimens from this prolific district. Desirability increases greatly with improved luster, and glassy specimens of almost any color command a premium price. As if all this weren't enough, some specimens show a sprinkling of bright chalcopyrite or pyrite crystals. Inclusions commonly include barite and chalcopyrite. For sheer

numbers, variety of colors, mineral associations and aesthetics, Illinois fluorite ranks as the best in the world.

Barite from the southern Illinois mines is vastly underrated and -appreciated. Huge quantities of pale blue barite plates were produced, and the exquisite stalactitic barites from the Annable Lee (above all others) are unique. Still, the yellow to orange crystals, to several cm., especially from the Denton mine, are the best from the district. The Gaskins mine produced some very large yellowish crystals, and the Minerva No. 1 is noted for its pale blue clusters associated with bright yellow calcite. Especially pleasing are the yellow/white color-zoned barite crystals perched atop purple fluorite, which host lustrous, colorless to yellow, calcite crystals! The Annabel Lee mine produced a very few barite pseudomorphs after celestine, perched upon purple fluorite.

Good clean undamaged calcite specimens from the district are difficult to find. Thousands of white, opaque, spiky clusters were brought from the Minerva No. 1 mine in years past, but the honor for best calcite in the district easily goes to the Denton mine. Denton calcites are highly prized for their terrific golden yellow color, bright luster, seemingly endless forms and twins, and for their penchant for being aesthetically perched upon purple fluorite. The Annabel Lee mine produced specimens reminiscent of Elmwood, TN, material, though not as gemmy or large. Odd, spheroidal clusters of orange-yellow calcite crystals, from the Minerva No. 1, are unique and prized; this same mine also produced intensely colored golden-orange acicular clusters and sheaves.

Many collectors are blind to the fact that the district produced some exquisite galena specimens. True, nearly all of the best galenas are associated with fluorite, but this doesn't detract from the fact that they are truly fine representatives. Oftentimes, the association is so intimate that one could scarcely categorize the piece as a fluorite specimen or a galena specimen! Ross Lillie, a mineral dealer and former geologist, who worked and collected in some of the mines in the district, once showed me a large purple fluorite cluster, from the Denton mine, that displayed a mirror-bright square of galena crystals on the front of each fluorite crystal. Absolutely stunning and incredible! The Denton mine probably produced the finest specimens in the district. Incidentally, galena was the primary ore in the district for years; the mining of fluorite for the steel-making and chemical industries didn't commence for decades thereafter.

Witherite is eagerly sought, and truly fine specimens are now difficult to obtain on the market. This barium carbonate mineral is present as pseudohexagonal twinned crystals and stout prismatic crystals to several cm. Strongly fluorescent, these specimens rival their English counterparts for aesthetics, quality and size. Perhaps most desirable are the steep dipyramidal crystals on matrix. Though generally white to very pale yellow, witherite is, nonetheless very desirable, and good specimens, especially those from the Minerva No. 1 mine, are expensive and becoming hard to find.

The district has also produced lesser quantities of several well-crystallized species. Benstonite is a rare barium calcium magnesium carbonate mineral that occurs as rhombohedral crystals barely exceeding one cm. The best specimens (and I believe the only ones in the district) came from the Minerva No. 1 mine. Difficult to obtain now, benstonite is primarily sought after by those specializing in southern Illinois minerals. Sphalerite specimens from the Deardorff and Denton mines, in particular, are noteworthy. The Deardorff specimens are frequently associated with clear to white quartz crystals. The Denton pieces, perhaps the best in the district, frequently host small pyrite crystals on their crystal faces, and are often associated with calcite and fluorite. Strontianite specimens from the district hold their own against any locality worldwide. Specimens from the Minerva No. 1 mine are the finest, and are present as white radiating spheres on fluorite, and as spiky clusters of acicular crystals without matrix. (I'll never forget visiting with the late Dick Heck in Tucson, where he allowed me to view his magnificent collection, which was very heavy in southern Illinois minerals. I spied his wondrously large strontianite crystal cluster and remarked that I had seen the specimen pictured in the *Mineralogical Record.* He grinned from ear to ear,

and complained that the MR neglected to attribute the specimen to his collection!)

Mining finally ceased in 1995 with the closure of the Annabel Lee and Ozark-Mahoning No. 1 mines. (It should be pointed out that the Minerva No. 1 and Ozark-Mahoning No.1 mines are one and the same, and the name change simply reflects a change in ownership that took place in 1988.)

Specimens mined prior to this time should be attributed to the Minerva No.1 mine, and those mined since 1988 can be attributed to the Ozark-Mahoning No. 1 mine). Extensive deposits still exist within the district, but the likelihood of renewed mining is not good. Cheaper Chinese fluorite has made fluorite mining unprofitable in the district, even when the lead, silver and zinc values are added to the bottom line. Unfortunately, there was no successful effort to maintain one of these mines for educational/historical/tourism purposes. How wonderful it would have been to have opened a state park, complete with a small museum, visitor center, and underground mine tours. Upon my last visit to the district, finishing touches were being done on the American Fluorite Museum in Rosiclare. The Ben Clement Museum in Marion, KY, is open to the public, and is home to exceptional specimens from both sides of the river.

Of course, my choice of this mining district as "America's Greatest Mineral Locality" is purely opinion. The district certainly has been a prolific source of incredible specimens for many, many years. Collections worldwide are graced with superb specimens from area mines, and high-quality specimens are eagerly sought today. Certainly, we should never think of the southern Illinois fluorite district as having produced solely exceptional fluorites. Having the opportunity to view magnificent private collections (as in Ross Lillie and Dick Heck) has afforded me the chance to view the full spectrum of mineral species, specimens and associations. Hidden beneath the rolling farmland and forests of southern Illinois lies a world-class mineral locality---we can only wish that the mines were still active!

Just for the fun of it, and in no particular order, I'll list the next best five districts in the US (with 3 of the best known mineral species from each): Bisbee, AZ (azurite, cuprite & malachite); Keweenaw copper deposits, MI (calcite, copper and silver); Franklin/Sterling Hill, NJ (franklinite, rhodonite & willemite); Elmwood/Cumberland mines, TN (barite, calcite & fluorite); and the Tri- State district, KS, MO & OK (calcite, galena & sphalerite). Perhaps you have other suggestions?

Suggested Reading:

Goldstein, Alan, 1997. "The Illinois-Kentucky Fluorite District," *The Mineralogical Record*, Vol. 28, No. 1. One of the finest issues ever produced of the MR, this issue is fairly thorough in its treatment of the district, with emphasis on the geology, history and mineralogy of the area. Great specimen photos, many from the Ross Lillie collection of southern Illinois specimens.

Museums: The Ben E. Clement Museum in Marion, KY, is open by appointment. Ben Clement was a Kentucky mine operator who specialized in collecting minerals from the Illinois and Kentucky fluorite mines. The museum houses several thousand specimens.

The American Fluorite Museum in Rosiclare, IL, was not yet open on my last visit to the area. It is located on the property of the Rosiclare Lead and Spar Company.

Arrowhead News (Mar., 2002)