THE ROCKFINDER

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

HAPPY HOLIDAYS

DUES ARE DUE

MICHIANA GEM & MINERAL SOCIETY, INC.

AFMS

SCRIBE

MID WEST FEDERATION

THE ROCKFINDER

DECEMBER, 2000

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
_____Junior $1.00 per year
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Please indicate areas of special interest.
General Geology____ Beads ____
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Please send your dues and this form to
Michiana Gem & Mineral Society
c/o Margaret Heinek
7091 E. East Park Lane, New Carlisle, IN 46552

HEADS OF COMMITTEES

Programs	Don Church 616-651-7616
Hospitality	Pat McLaughlin 259-1501
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Sunshine	Sally Peltz 616 683-4088
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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.

Additional names:
Name_____
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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 _____

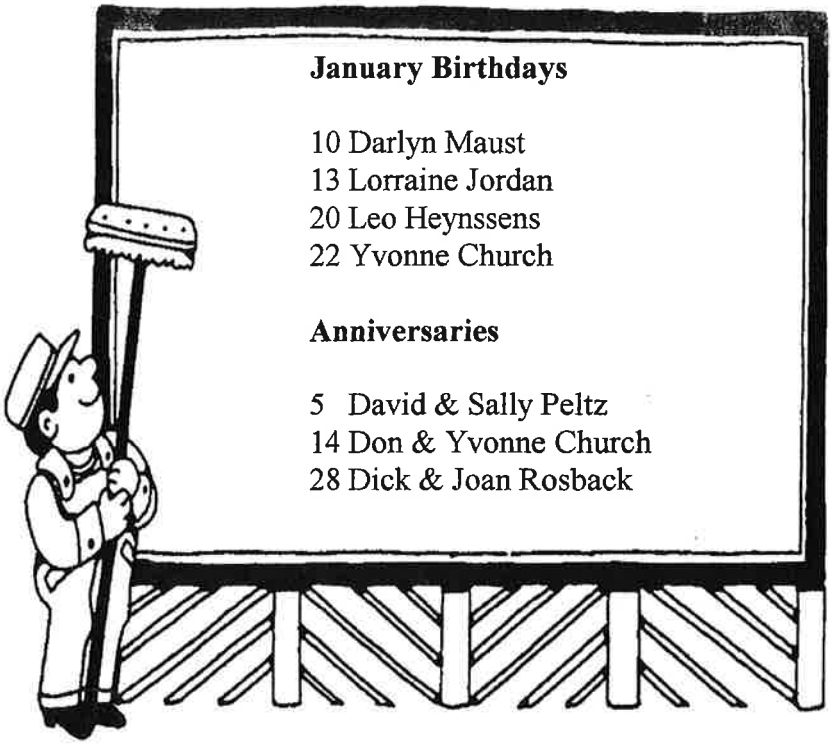
THE ROCKFINDER

Newsletter of the Michiana Gem & Mineral Society

Volume 40, Number 10 **December, 2000**

Meeting: No meeting until January

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



January Birthdays

10 Darlyn Maust
13 Lorraine Jordan
20 Leo Heynssens
22 Yvonne Church

Anniversaries

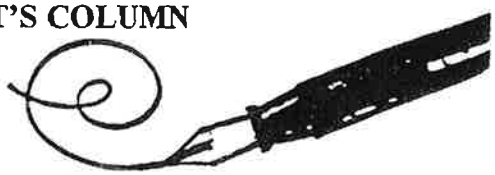
5 David & Sally Peltz
14 Don & Yvonne Church
28 Dick & Joan Rosback

2001 DUES SHOULD BE PAID NOW.

Dues for next year can be paid anytime before January 1. You can send a check to Margaret with the correct amount, as shown inside the front cover of this newsletter. Include your birthday if you want it noted in the *Rockfinder*.

merry Christmasaurus

MARGARET'S COLUMN



MERRY CHRISTMAS to all! As this will be my column as the outgoing president of the Michiana Gem & Mineral Society, I would like to congratulate Don Church as your new president. But you can't get rid of me so easily, as I was nominated as vice-president. Don is a very enthusiastic person and will really serve the club well.

This has been a funny December, but more like the other years when we had many storms with snow and drifting. The last few years have spoiled us by not having such cold and stormy weather. Oh well, every day takes us closer into the rock-hunting season.

Bob and I have heard from several of our out of town members, Elma and Leo Heynssens, Gordon Dobecki and Larry Hess. Gordon's letter tells about his trip to Australia and the opals. Elma and Leo are planning a workshop, but so far have not found anyone who will do the work for a reasonable price. I hear several of our South Bend members are planning a trip west for the Tucson show. Wish I could go, but not this year. Churches will be one couple going, so I, as vice-president, will be conducting the January meeting.

I want to thank all of the members who work to make this club a good one. If you missed the Christmas party, you missed a good one. The food was really good, the exchange gifts were really nice. Ask Kathy about her gift, a small rockhound tree. The decorations were really nice thanks to the Millers and Nelsons. The McLaughlins did a superb job with the punch table, and the chicken was extra good this year, or maybe I was hungry!

Gordon's letter:

Dear Rockhound Friends,

I hope everyone had a good time at the annual Christmas party. I did my celebrating while I was down in Australia. As they say down there as the hot weather approaches, "It's beginning to feel a lot like Christmas." Even the opal displays had all the colors of Christmas. I wish that I could have gone to Coober Pedy or some of the other opal diggings, but the only practical way to get there is on a tour and I was traveling independently on standby to save money. My brother, Gerry, with United, got me a pass for $310 round trip from San Francisco to Sydney. You have to keep checking with reservations to see when seats are available. I ended up going 1 day earlier & returning 4 days earlier than planned. Lucky for me they gave me business class on the homeward journey.

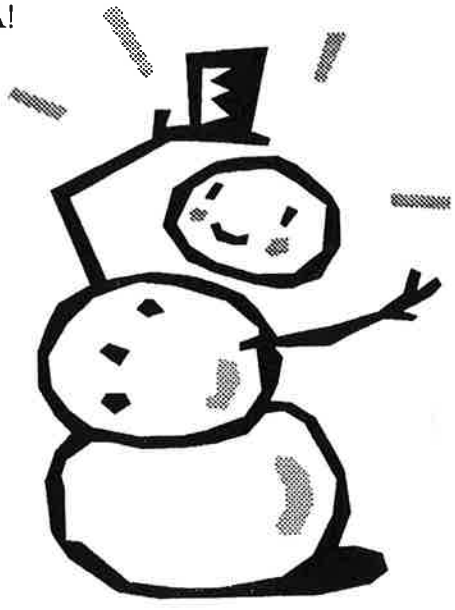
I did meet some fellow rockhounds in Handorf, a small German community outside of Adelaide. They sold me some of their opal. It was only fair quality but I felt obligated, as I spent the whole evening & supper with them.

One of the fossickers, as they like to call themselves, also collected several interesting American cars, among them a '38 Cadillac LaSalle, '56 Buick Roadmaster & a '55 Cadillac Limo.

The stores mostly were showing boulder opal & were charging tourist prices for them. Fortunately the U.S. dollar is worth so much there, about 2 Australian dollars for one of ours, that costs were very reasonable. While Australians were paying $4.00/gallon for gas, my costs were closer to $2.00. Avis was real nice to me in Adelaide & gave me a "Lexus-like" car with satellite navigation for the price of a cheapo because they needed to return it to Sydney & that's where I was heading.

I'm relaxing now for a few days but will go back on treatments before Christmas. I hope you all will be healthy for the holidays, & keep hoping that it will snow. Yours, Gordon.

SNOW, HA HA!



MINUTES OF COMBINED CHRISTMAS PARTY AND NOV./DEC. MEETING

Between 1:00 and 1:30 p.m. members began to arrive, carrying gifts and covered dishes of holiday goodies to the serving table. The meeting room was decorated with evergreen boughs, red tablecloths and a lighted Christmas tree. People were welcoming each other around the punch and cheese/crackers table, which was hosted by Pat and Tom McLaughlin. When the hot fried chicken was announced, about 2:00 p.m., everyone was ready to enjoy the many different entrées and salads.

Business meeting.

Then, while drinking our coffee, President Margaret Heinek opened the meeting by introducing Vice-President Church, who would announce the candidates for the coming year. They were Margaret Heinek, president; Don Church, vice-president; Gladys Pacholke, secretary; Bob Heinek, treasurer; David Peltz, liaison. Herb Luckert made a motion to accept this slate; Sam Shapiro seconded the motion. All agreed with a "yes," but after discussion, it was thought better to relieve Margaret of her duties as president, name her as vice-president, and name Don Church as president. Also, David Peltz said he will not have the time to devote to the duties of liaison officer, since he is taking a new job. Members asked if Sally Peltz would take his position. She agreed. The new slate then was: President, Don Church; Vice-President, Margaret Heinek; Secretary, Gladys Pacholke; Treasurer, Bob Heinek; Liaison, Sally Peltz.

Bob Miller motioned that we accept this altered line-up. Tom McLaughlin seconded the motion. The motion carried unanimously. At this point, Herb Luckert withdrew the previous motion.

Science Alive in February at St. Joseph County Public Library:

Members decided to support this program again this year. Bob and Margaret will work Friday and Saturday. Sally and David Peltz and Diane Gram will also work. Small rocks to be used as gifts will be needed. Any ideas for games to play will be welcome.

Kathy Miller is looking into the possibilities for a bus trip to Mazon Creek. More details later.

A suggestion to furnish the paper products—cups, plates, tableware—for the club's dinners, etc. was made. Everyone thought that would make coming to the dinners, etc. more, enjoyable.

The gift exchange brought "Oh's" and "Ah's" as the gifts were opened.

Donations of $50 each were voted to the following community agencies: Battered Women, Center for the Homeless, Salvation Army and St. Vincent de Paul. One hundred dollars was voted to be donated to Our Redeemer Lutheran Church.

Book sale: The book sale of some of our books which was to be at this meeting was canceled because many books are still checked out. Members should return the library's books soon so the librarian will know how many and which ones to put on sale in the near future.

Gladys Pacholke, Secretary

THE MANUFACTURER OF CEMENT

By Michael Finney

Lafarge's Davenport Plant is located along the Mississippi River next to a large deposit of limestone. Limestone is one of the primary ingredients in the cement-making process.

The limestone quarry has been in use since 1927, and consists of 600 acres. It is estimated that, at the current rate of use, the quarry has an expected life of more than 60 years.

Explosives are used to blast the face of the limestone quarry. Then, large endloaders fill the 85-ton trucks with pieces of limestone, some of which are up to six feet in size. The trucks carry the rocks to the primary crusher, located on the south side of the quarry.

A 1,750-horsepower motor powers the primary crusher. It breaks the large pieces of limestone into 4-inch rocks and mixes in other raw materials. The rock then moves from the crusher, over Highway 22 on an 85-foot high conveyor, to the pre-blender dome. This crushing system produces about 1,300 tons of rock per hour.

A stacker-reclaimer machine in the dome blends the limestone rock with clay and other raw materials. The raw material then moves to the second crushing stage, the roller mill. With a capacity of 230 tons per hour, the roller mill crushes the 4-inch diameter rocks into a fine powder. The pulverized material (kiln feed) is moved from the roller mill and dried by waste heat from the kiln process.

From the mill, the raw material is moved to the homogenizing silo, where it's blended again to stabilize its chemistry. The kiln feed is then conveyed to the preheater tower.

The preheater tower is the tallest structure at the plant, 335 feet high. Inside, the powdered material is heated to about 1,660 degrees Fahrenheit. When the material reaches the bottom of the tower, it enters the crucial burning stage in the kiln.

The kiln, at 197 feet long and 13 feet in diameter, is said to be the world's largest man-made industrial moving object. It rotates at 3.3 revolutions per minute. A coal-fired burner heats the material to 2,700 degrees Fahrenheit as it tumbles through the kiln.

The heat turns the powdered feed into a molten rock. As it tumbles, the raw material becomes "clinker," small black cement "rocks" ready for the next step— finish grinding. Sometimes the clinker forms into huge balls too big to exit the kiln. When this happens an 8-gauge industrial shotgun with 3-ounce lead slugs is used to break up the ball while it is tumbling in the kiln. To do this requires about 4,000 rounds of ammunition and two weeks of around the clock firing.

When the clinker emerges from the kiln, it must be cooled. Movable grates catch the clinker as it flows out of the kiln, as fans force air through the grates to cool the material. The air, which is heated by the process, it recycled for greater energy efficiency.

The clinker then moves to the finish mill where it's mixed with gypsum and crushed into the finished product, Portland cement. The gypsum is added so that the finished concrete will not harden too quickly.

The finish mill is a large, two-compartment steel cylinder. It is 15 feet in diameter and 53 feet long and rotated by two 3,500-horsepower motors. Inside, 300 tons of steel balls are used to crush the clinker into a fine powder (cement). The finish mill can crush up to 165 tons per hour. From the finish mill, the cement is pumped to storage silos for the final stage.

The plant's storage silos can hold up to 160,000 tons of cement, and the finished product can be loaded for shipment by river barges, semitrailer trucks or rail cars.

The bulk loading into trucks and rail cars can be done in just minutes through automatic hopper systems. Up to 200 tanker trucks, 25 rail cars and a 1,400-ton barge can be loaded per day.

The plant has an annual production of 1 million tons of finished cement. The plant employs 100 people with a combined payroll of over $5,000,000 annually and consumes over $10,000,000 in local services.

Everywhere we go it seems we are surrounded by concrete, but have we ever taken the time to think about it?

Cedar Valley Gems (June, 2000)

WHERE FOSSILS ARE FOUND IN OHIO

Ordovician rocks in Ohio are world famous for the abundance, variety and excellent preservation of the fossils they contain. The limestones and shales exposed in almost every road cut or streambed in southwestern Ohio, southeastern Indiana and north-central Kentucky provide the opportunity to collect a bonanza of fossils. Among the more abundant types of fossils collected from Ordovician rocks are brachiopods, bryozoans, gastropods and trilobites.

Silurian rocks of western Ohio are not known for their fossils. When the limestones and shale were first deposited they were quite fossiliferous. Unfortunately, most of the fossils were destroyed when the limestones containing the fossils were altered to dolostones. One Silurian rock unit that still retains well-preserved fossils is the Brassfield Formation. The Brassfield is composed almost entirely of fragments of crinoids. Even the dolomitized formations contain molds and casts of fossils, in particular brachiopods and trilobites. Quarry operations in western Ohio have exposed much, preserved in Silurian-age rocks. Reefs are indicative that warm, open-marine conditions existed in Ohio at this time. Colonial corals are the most prominent fossil type. Silurian-age rocks are well exposed in an area from west of Dayton to near Portsmouth.

Devonian rocks in Ohio are as famous for their fossil abundance and diversity as are Ohio's Ordovician-age rocks. There are two main areas of exposure of Devonian rocks in Ohio: northwestern Ohio and a north-south belt through the center of the state and along Lake Erie. The shales of the Silica Formation near Sylvania, in northwestern Ohio, contain abundant trilobites and brachiopods. The Columbus and Delaware Limestones, exposed from central Ohio to the Lake Erie islands, are quite fossiliferous. Fossils in the Columbus Limestone are notable for their large size. Perhaps the most spectacular fossils from Ohio Devonian-age rocks come from the Ohio Shale near Cleveland. Construction projects in and around Cleveland have produced armored plates and jaws of fossil fishes known as arthrodires.

Mississippian rocks in Ohio were deposited as deltas by rivers that flowed westward from the ancestral Appalachian Mountains into the Appalachian Basin. A similar process is taking place today where the Mississippi River flows into the Gulf of Mexico. Some of Ohio's Mississippian rocks are quite fossiliferous, containing abundant limonite-stained molds and casts, brachiopods, pelecypods and echinoderm fragments. Mississippian rocks are exposed from near Portsmouth northward to Lorain and eastward to Ashtabula.

Pennsylvanian rocks are well exposed in eastern Ohio and were deposited primarily in swampy conditions associated with deltas along the Appalachian Basin coastline. These rocks are noted for well-preserved fossil plants and rare fossils of insects and amphibians. Marine fossils such as pelecypods, gastropods and brachiopods are abundant in thin beds of limestone and shale deposited when the sea periodically flooded the coastal coal swamps, 320-286 million years ago.

Permian rocks of Ohio are not very fossiliferous. However, bones of amphibians and reptiles and plant and insect fossils have been collected from rocks of this age. Permian rocks are exposed in southeastern Ohio near Marietta.

The Pleistocene glaciers left a mantle of unconsolidated material across northern and western Ohio. Bones of Pleistocene mammals, particularly mastodons and mammoths, have been collected from deposits of this time. Even forests buried by the advancing glaciers have been unearthed. Deposits from this time period are easy to see because they cover most of Ohio.

WHERE TO COLLECT FOSSILS IN OHIO

Even though Ohio is well known for its fossils, publicly accessible collecting localities are actually scarce. Most sites are located in southwestern Ohio; Caesar Creek (Warren and Clinton Counties), Hueston Woods (Preble and Butler Counties), Cowan Lake (Clinton County) and Stonetick (Clermont County) State Parks allow fossil collecting; check at the ranger station for designated areas. Caesar Creek State Park requires a collecting permit (available free from the Visitors' Center). Many of Ohio's state parks, nature preserves and memorials have prominent geologic features (Hocking Hills, Clifton Gorge, Glacial Grooves, Nelson-Kennedy Ledges) but do not allow collecting. Local, city and county parks,

as well as private camping areas, may have access to fossil-collecting areas. Contacting the operators of these areas may prove beneficial.

RULES FOR COLLECTING FOSSILS

Most land in Ohio is private property. Always obtain permission before collecting. Most public lands (local, state or federal) do not permit fossil collecting, except in designated areas.

Leave the property the way you found it: no littering; leave gates the way you found them or were asked to leave them; do not throw rocks onto roadways, sidewalks, driveways or into streams. In short, practice the "Golden Rule" and treat a collection site the way you would want someone to treat a site on your land. Always exercise caution. No fossil is worth risking a life or limb for--either your own or someone else's.

Each fossil or group of similar fossils from a given rock unit or locality should have a label that provides the locality, collector and date of collection. Lacking this information, a fossil is just an interesting rock, with little scientific value.

Keep fossils from different collecting sites separate. Even fossils collected from the same locality but from different spots or different rock units should be kept separate.

There are many ways to clean fossils. Some fossils can be cleaned with water. Others may require advanced cleaning equipment, such as an air-abrasive machine. When in doubt about how to clean a fossil, leave it alone rather than risk damaging the fossil.

If you have collected what you think is a unique or exceptionally well-preserved fossil, let an expert examine it. Contact the Division of Geological Survey or the geology department of a nearby university.

Lithnics (July, 2000)

TIGEREYE

By Leonard Sill

Tigereye is massive crystalline quartz that has replaced masses of closely packed fibers of crocidolite (asbestos). Blue Tigereye is sometimes referred to as hawk's eye. Other colors are golden brown, green and variegated. Golden tigereye can be turned to an attractive red color by heat-treating. The source of this information and detailed instructions on altering the color of tigereye may be found in *Gem Cutter's Handbook* by Gems & Minerals, dated May, 1966.

Tigereye is so well known that we usually don't think about it being a pseudomorph, meaning that it was something other than what we are now seeing. The word "pseudomorph" is from the Greek words "pseudo," meaning false, and "morph," meaning shape. When all of the conditions were just right, the quartz replaced the asbestos mineral, faithfully reproducing its structure in silica, giving it the hardness of quartz. This, along with the minerals that give the various colors, makes it ideal for beautiful lapidary objects. The fine silky asbestos fibers compacted reflect light in a chatoyant and pleasing manner, giving tigereye a unique and distinct beauty of its own. These same fibers can give the cutter problems if the stone is not cut and polished in the proper manner. Remember to polish across the fibers to avoid "pulling."

If tigereye is oriented so that the fibers run parallel to the short axis of an elongated stone, an eye will run along the stone's long axis. If the stone is oriented so that the fibers run diagonally, a wavy light will move across the surface. In order to get good sharp eyes in tigereye, material with straight fibers is needed. High cabochons will produce narrow eyes. Broad bands of light are displayed on low cabochons.

When polishing tigereye use sharp new paper or a diamond wheel. Most of the stones we polished years ago were done on rather firm leather, first with tin oxide, followed by cerium oxide, both beginning with water. For final polishing with cerium oxide we let the wheel run dry with great care to not overheat the stone. Now we prefer diamond wheels with water, as there is practically no pulling of the fibers and no heat problem.

You are indeed fortunate if you have some good quality tigereye slabs or rough, since it is difficult to find top quality material. May the tiger-eyes be seeing you soon.

Chips and Tips (Nov., 1994)

PLUME OR DENDRITE?

It is not uncommon to see some agates from west Texas labeled as dendritic, and it is not uncommon to see agate from Montana labeled as plume agate. Is there a fundamental difference between dendrites and plumes?

Plume agate from about 18 miles south of Alpine, Texas, has been known since about 1890, having been first recorded by the pioneer geologist Udden. Some of these agates were displayed in the Texas Pavilion at the Trans-Mississippi Exposition in St. Louis in 1901. The plumes in these agates are characterized by feathery inclusions made up of metallic sulfide minerals, usually marcasite or pyrite.

Some other sulfides have been seen to form plumes, including cinnabar, orpiment, realgar and possibly stibnite. In the west Texas agates, the agate has formed around the plume. It is not too unusual to see an occasional bubble beside one of the tiny sulfide crystals. The west Texas agate occurs in andesitic rocks of the Oligocene.

It is known that minerals crystallize out of magma or lava in a given order: olivine, pyroxene, amphibole, biotite, followed by feldspar, quartz, etc. The final products to crystallize are the metallic sulfide minerals. These can crystallize in vugs formed by gases in the lava or magma. (Thus, the plumes were there before the agate.)

After the lava flow, the highly explosive volcanic eruptions of rhyolite lavas may deposit welded tuffs of ignimbrites over the andesitic rocks. The tuffs are excellent sources for silica. As the tuffs are weathered, silica is leached from them and, in turn, deposited in the vugs that contain the last-stage plumes that crystallized in the vugs formed in the previous eruption.

Thus, in the plume agates, the plume was first and the agate formed around it. Some of the plume-forming minerals may be oxidized, to become hematite or limonite—products formed from the weathering of sulfide minerals.

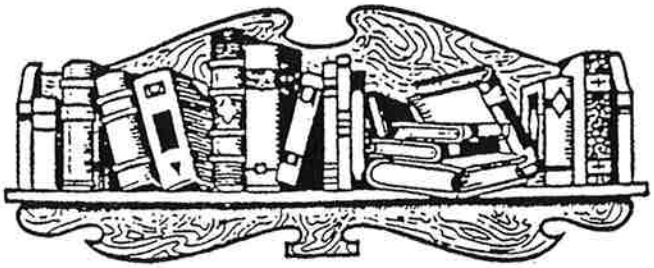
In dendritic agates, we have a different story. The agate forms first, in a cavity in extrusive rocks, or even in sedimentary rocks. Dendrites are formed by oxide minerals such as limonite, pyrolusite and a host of other manganese and iron minerals. The dendrites form when the agate spends some time permeated with solutions (probably water) that are saturated with minerals. The dendrites are laid down in spaces between the bands of agate or along fractures within the agate. There is, then, a fundamental difference between plume and dendrite.

Petrified Log (no date, no author)

YOU DON'T HAVE TO BE A ROCKHOUND TO APPRECIATE CALCITE!

Did you know...
Calcite is the most common carbonate.
Calcite is the most widespread Michigan mineral of the ore-forming period.
Calcite makes up the rock limestone.
Calcite forms stalactites and stalagmites in limestone caves.
Calcite is found in hundreds of crystal shapes.
Calcite is found in many different colors including clear, white, pink, green, gray, yellow, red and even blue.
Calcite, pure and transparent, is clear enough to read through.
Calcite, when broken, cleaves into 6-sided fragments called rhombs (rhombohedrons).
Calcite splits sometimes into flat rectangular pieces through which you can see double images due to the unusual way the mineral causes light to bend.
Calcite streak is white.
Calcite hardness on the Mohs scale is 3.
Calcite density is 2.7.
Calcite fizzes in vinegar or hydrochloric acid.
Calcite sometimes is fluorescent or phosphorescent.
Calcite is used in optics, chemicals, building and more.

no author, *GEMS* (June, 2000)



FOR FURTHER READING....

Bipedalism has taken a big step backward. Scientists say that a newly discovered reptile was walking on two legs about 290 million years ago, 60 million years earlier than the previous record-holder. *Eudibamus cursoris* ("primitive two-legged runner") was discovered in Germany, and is probably not the forerunner of later bipedal reptiles, for anatomical reasons. It's likely that bipedalism evolved several times among reptiles.

Science News (Nov. 4, 2000)

Out of nine complete *T. rex* fossil skulls examined by Canadian paleontologists at the Royal Tyrrell Museum, four showed wounds like bite marks. Evidently these large dinosaurs fought each other for social dominance and territory, just like modern pack animals.

New Scientist (July 29, 2000)

Chinese researchers have calculated the length of time it took for the Permian extinction, when some 95% of earth's species perished. The extinction (251 million years ago) is said to have occurred over a period of only 160,000 years. The cause is still unknown.

New Scientist (July 29, 2000)

The flaws in diamonds may not be good for purists but they are a boon for scientists. Russian researchers have fired single-wavelength beams of X-rays into quartz impurities which were incorporated into a Venezuelan diamond when it was forming. They discovered that the quartz (in a superdense form called coesite) is still at very high pressure within the diamond--about 36,000 atmospheres. The diamond is so hard that it preserves some of the high-pressure forces under which it formed.

Science News (Oct. 21, 2000)

A weekend prospector at Harvey Bay, Aus tralia, has found an opal mussel-shell gem worth nearly $2 million. Bruce Parker was in an opal field about 30 miles west of Lightning Ridge and just happened to crack open the shell with his pick. There was no sign of opal on the outside. The gem contains a full spectrum of colors and weighs over 500 carats. Also, since Parker is not a professional miner, he will not have to pay tax when he sells it.

via *Tar Heel Tailings* (Dec., 1999)

The fabled Homestake Gold Mine in Lead, South Dakota (pronounce it "Leed"), announced on September 11 that it has begun a 16-month closing procedure and will cease mining in 2001. The mine was opened on April 9, 1876, by Moses and Fred Manuel, at a place where the gold vein actually outcropped at the surface. Miners today work on a 24-hour-a-day schedule in hundreds of miles of shafts and tunnels, reaching nearly 8,000 feet below the surface. The closure is a matter of economics; it now costs nearly as much to mine the gold as it can be so' for.

Pick & Shovel (Nov., 2000)

Rock collectors in Spain have discovered a whopper of a geode (a nodule with crystals lining its interior cavity). The geode is 8 meters long and 1.7 meters high (27 by 5.5 feet) studded with 20-inch gypsum crystals. It may have formed about 6 million years ago.

Science (June 23, 2000)