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

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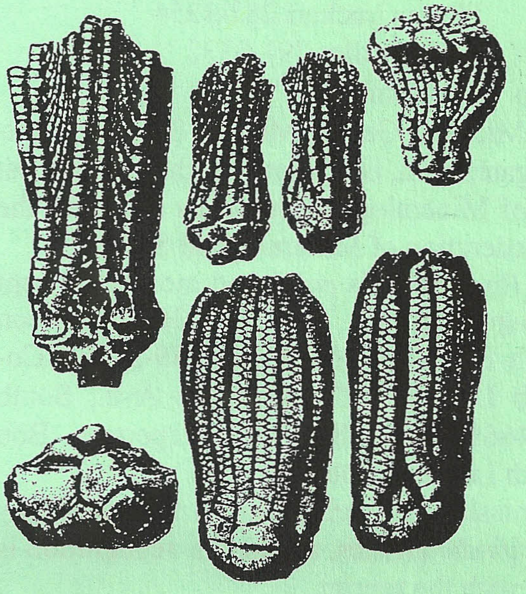

Perry, Martha
58075 Potawatomi Dr
Osceola, IN 46561

46561+9638

MICHIANA GEM & MINERAL SOCIETY, INC.

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THE ROCKFINDER

MAY, 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.

✂--

Yearly Membership Dues (Payable by January 1)

______Individual $10.00 per year
______Family $15.00 per year
______Junior $1.00 per year
______Subscriber $7.50 per year

Please indicate areas of special interest.

General Geology____ Beads ____
Gems & Minerals____ Fossils ______
Cabochons________ Field Trips ____
Faceting__________Crystals ______
Carving__________Micromounts ______
Other____________Jewelry Making______

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Please send your dues and this form to
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c/o Bob Heinek
7091 E. East Park Lane, New Carlisle, IN 46552

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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______________________________
Birthday__________

Name______________________________
Birthday__________

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Birthday__________

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Date of Wedding Anniversary ________________

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PLEASE READ AND SIGN THIS SECTION:
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Signed________________________Date __________

THE ROCKFINDER

Newsletter of the Michiana Gem & Mineral Society

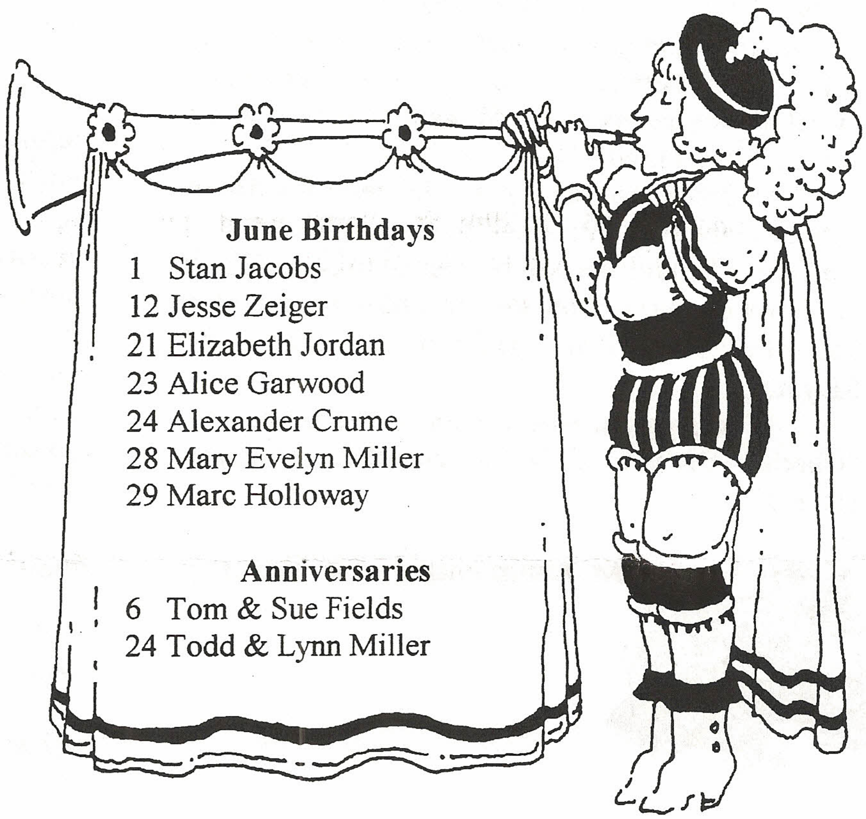
Volume 42, Number 5 May 2002

Meeting: Sunday, May 19, 2002
Doors open at 1:30 p.m.
Meeting starts at 2:00 p.m.
Guests are always welcome.

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

Program: The Great Floods: Ice Age Washington and Oregon (a video). Everyone is encouraged to bring in material relating to the subject.

Refreshments: Bess Wise, Addie Niebauer
Herb & Phyllis Luckert



June Birthdays

1 Stan Jacobs
12 Jesse Zeiger
21 Elizabeth Jordan
23 Alice Garwood
24 Alexander Crume
28 Mary Evelyn Miller
29 Marc Holloway

Anniversaries

6 Tom & Sue Fields
24 Todd & Lynn Miller

UP AND COMING

May 24-26: Flint Ridge Runners Meet and Swap, Muskingum County Fairgrounds, Zanesville, OH.
May 25-27: Chicagoland club's Gem, Mineral and Fossil Show, DuPage County Fairgrounds, Wheaton, IL.
May 31-June 2: State Line Gem & Mineral Society show, Fulton County Fairgrounds, Wauseon, OH.
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.
Aug. 16-18: Midwest Faceters Seminar, Mott Community College, Flint, MI.
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.

MINUTES: APRIL 28 MEETING

President Don Church called the meeting to order at 2:00 p.m. There were 27 members present and four guests: Robert and Barbara Reed, Ginger Thomas and Tony Guo. The minutes of last month's meeting were approved as printed in the *Rockfinder*. Bob Heinek being absent, there was no treasurer's report. Four door prizes were awarded.

Kathy Miller gave an update on the October field trip. Three members signed up for the remaining motel rooms reserved. Additional rooms may be reserved if required.

Tom Noe suggested that the club reserve a day in July at University Park Mall to display MGM club materials. Volunteers will be needed to be available to answer questions about the club and to promote the Labor Day show. It will be further discussed at the May meeting.

The program was a report by Sam Shapiro: "Charles Darwin, Geology and the Galapagos Islands."

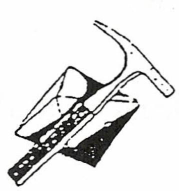
M. Jeanne Finske, CSC, Secretary

WILL DAN ZEIGER HUNT ROCKS IN MIDDLE EAST?

MGMS member Dan Zeiger is serving with the George Washington battle group on the *USS Barry*. In April they were engaged in exercises with Norwegian and other allied forces for their upcoming (June) deployment in the Persian Gulf. They practiced responding to various crisis scenarios. Dan will be deployed for six months on the *Barry*, a guided missile destroyer. Maybe he can pick up rocks if he ever gets near a beach!

If you'd like to contact Dan, he can be reached at:

ICFN Zeiger
DIV CE3
USS BARRY DDG 52
FPO AE 09565-1270



PYRITE AND MARCASITE DECOMPOSITION

Summary of a talk by Frank Howie on Unstable Minerals for The Geological Society (UK)

Under appropriate conditions many, but not all, pyrite and marcasite specimens will decompose into a gray or white power and sulfuric acid. This not only leads to the loss of the specimen, but also can damage cabinets and affect nearby specimens (by the release of acid).

The process of decomposition is oxidation. FeS_2 oxidizes to ferrous sulfate and sulfuric acid, and further oxidation changes the sulfate and some acid to ferric sulfate.

It has been held that bacterial action is necessary for oxidation of the sulfide to occur under normal environmental conditions. Frank Howie has investigated the chemistry of this process over a number of years and has conducted many controlled experiments. He concludes that bacterial action plays no part at all; so, antibacterial treatment of specimens is useless.

The essential condition is exposure to air at high relative humidity (RH). At an RH of less than 50% very little decay of pyrite occurs. At around 55% RH the rate rises rapidly and continues to increase as the RH nears 100%.

Some pyrite appears to resist the attack when all around disintegrate. Scanning electron microscopy (SEM) has shown that the attack starts in regions having microcrystalline structure. If the structure has a crystallite size in excess of about 10 mu, the crystallites will be angular and packed. Below 1 mu the crystallites are round with open interstices, giving a microporous structure. This acts like a sponge and provides a path for the moisture ingression at the start of the decay process, a process that is initiated by electrolysis.

Similar decomposition occurs in many other sulfides, e.g. arsenopyrite, realgar, chalcocite, stibnite and argentite.

The remedy is to keep the specimen in an RH maintained below 50%. This is generally achieved most of the time in a cabinet having close-fitting doors situated in a living-room environment. To ensure full-time protection, the use of silica gel as a desiccant is suggested (kept with the mineral specimen).

The Gemrock (Mar., 2001)

PALEOZOIC TERRESTRIAL PLANTS
By Fred Labahn

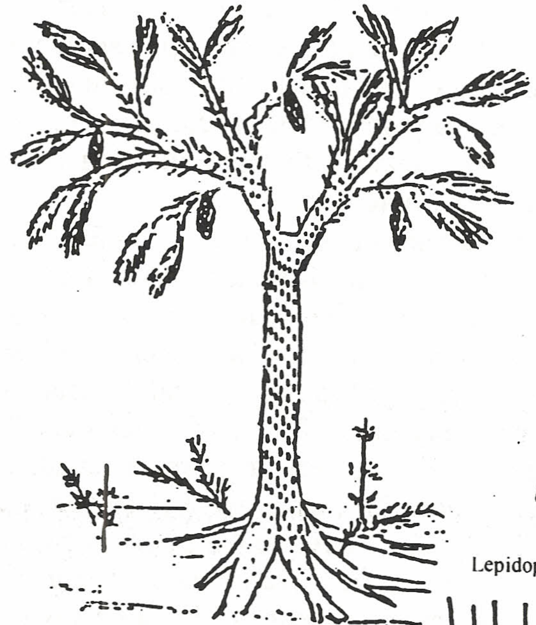
Let's take a look at some of the common trees and plants of this period:

Lepidodendron—the name means "scale tree," a tree that probably grew up to 100 feet tall with a diameter of two feet. The tree's parts have been given the following generic names: the roots, *Stigmaria*; the needle-like leaves—*Lepidophyllum*; the cones, *Lepidostrobus*; the cone leaves or bracts, *Lepidostrobophylium*. The name "scale tree" comes from the scars left on the bark when the leaves drop off. The size and shape of the scars are factors for identifying the different species. The outer bark is the scale bark.

There are also four layers of inner bark or subsurface bark with diminished identifying patterns or markings. These are *Aspidaria*, *Bergeria*, *Knorria* and *Aspidioposis*. There are many species of *Lepidodendron* named for the outer scales or rather the leaf cushions which wound around the tree in parallel spiral rows. *Lepidophloios* is somewhat like *Lepidodendron*; however, the scars or leaf cushions are always wider than high, while the reverse is true of *Lepidodendron*.

Calamites, the petrified reed, was a tree in which some species attained heights of 50 feet or more. The genus is named for the subsurface bark which is found preserved more often than the outer bark. This subsurface is covered with parallel ribs that alternate between each section. Some of the joints have large branch scars and smaller scars for leaves. *Calamophyllites* is the smoother outer surface where the rib markings are not as prominent as the subsurface. *Annularia* is a flower-like fossil which is a whorl or linear leaves growing from the joints of the slender branches. *Asterophyllites* is similar to *Annularia* but with narrower pointed leaves. *Calamostachys, Paleostachya* and *Macrostachya* are the cones of the different *Calamites* trees.

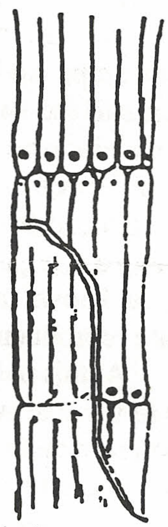
Sigillaria was a tree very widely distributed during coal-forming times but numerically was less in numbers than the *Lepidodendron*. Unlike the *Lepidodendron,* it seldom had branches but was



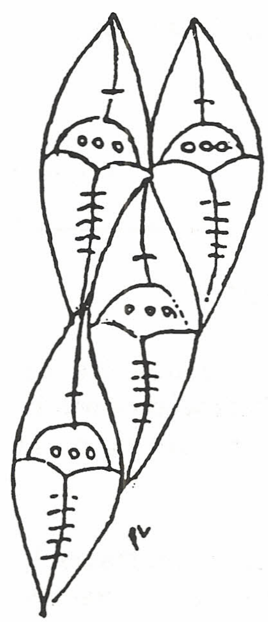
Lepidodendron scale tree

Lepidophyllum leaf

Lepidopstrobophyllum cone leaf, bract



Calamites with sub surface and smoother outer surface



Leaf scales, Lepidodendron

Lepidostrobus cone

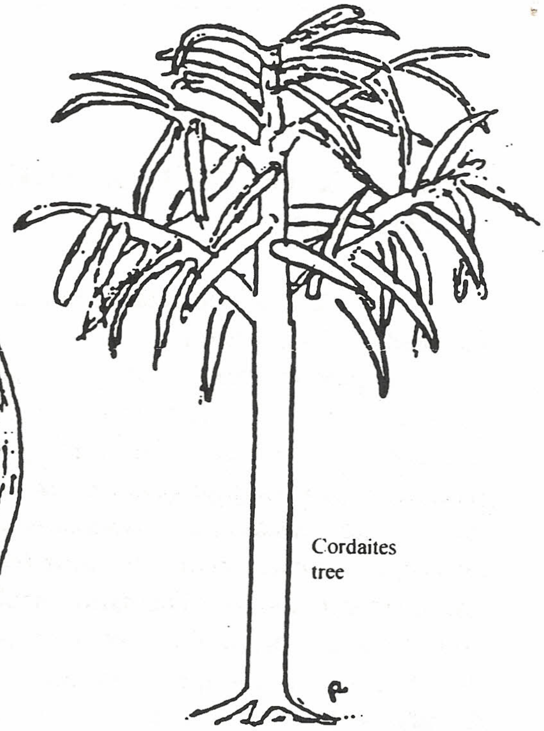
topped with a cluster of long, grass-like leaves. In this respect it resembled a modern palm tree. The straight, gently tapered trunk had a diameter up to six feet and a height of 100 or more feet. My collecting in the Mazon Creek area produced no specimens but several specimens were found with less collecting time at Brazil and Terre Haute, Indiana.

Cordaites grew to or exceeded 100 feet with a trunk up to two feet in diameter. They were less common than other trees but were very widely distributed around the world. The branches had large straplike leaves arranged spirally around the branches. They had no stems and leaf scars of attachment. The leaves were up to two feet or more in length and several inches wide. The leaves were classified under the general term *Cordaites* and the trunks, which are very rare, under the genus *Cordaicladus*. The general belief is that the trees grew in the highlands away from the swamps and that the leaves were carried by streams to the swamps and preserved while the trees died and decayed on the highlands. *Cordaites* differed from other trees, in that it was a gymnosperm. That is, it reproduced from a naked seed as opposed to those developed in a case. The male catkins, or reproducing part, is known as *Cordianthus*, while the seed or female reproducing part is *Cardiocarpus*.

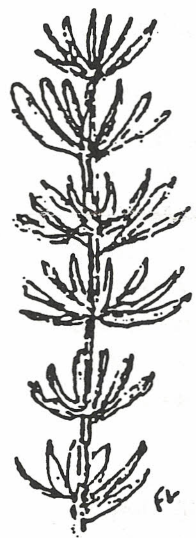
At this point I have told you about some of the trees of the coal swamps and the various parts that are found preserved as fossils. All are very interesting and some quite attractive.

The Rocky Mountain News (Mar., 1992)

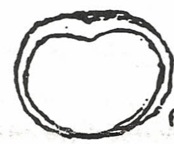
Cordaites branch
large strap-like
lef & leaf scars



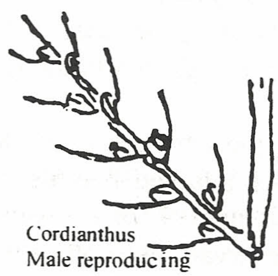
Cordaites
tree



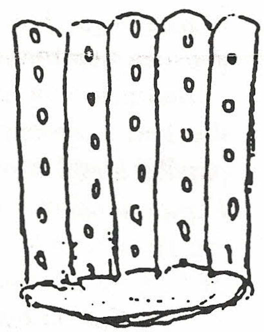
Asterophyllites equisetiformes
Calamites foliage



Cordaicarpus seed
female reproducing
part



Cordianthus
Male reproducing
part



Sigillaria, sub-bark

EMBARRASSING PREDICTIONS

"Drill for oil? You mean drill into the ground to try and find oil? You're crazy."--Drillers who Edwin L. Drake tried to enlist in his project to drill for oil in 1859.

"Stocks have reached what looks like a permanently high plateau."--Irving Fisher, professor of economics, Yale University, 1929.

"Everything that can be invented has been invented." --Charles H. Duell, Commissioner, U.S. Office of Patents, 1899.

"Louis Pasteur's theory of germs is ridiculous fiction." --Pierre Pachet, professor of physiology at Toulouse, 1872.

"640K ought to be enough for anybody." --Bill Gates, 1981.

ALFRED WEGENER AND MY BIG MISTAKE

By Sam Shapiro

I returned to my home town of New York in 1947, after two and a half years as a clerk-typist in the headquarters squadron of the Pacific Air Command. We lived in a commandeered office overlooking the Japanese emperor's imperial palace, and three blocks away from the Meiji Building, where General of the Armies Douglas MacArthur presided over the remarkable occupation that transformed Japan from a defeated militaristic regime into a democracy and a great economic power.

I was *so* happy to get back to my interrupted education at City College of New York! (Some other CCNY graduates: Henry Kissinger, Jonas Salk, Colin Powell.) I majored in history, and began the studies that led to my career at Notre Dame, 1961-1991. To fulfill my science requirement, I took a course in anthropological geography: the influence of climate, soils and geology on human society. One of the hot topics in those days was the question of what was then called "continental drift," the idea that the continents were drifting about. As far back as 1619, when the general configuration of the shores of the Atlantic Ocean was known, Francis Bacon observed that the bulge of Brazil would fit nicely into the hollow of West Africa, and suggested that the two continents might have been joined together like a jig-saw puzzle. The idea was forgotten for three centuries.

Then, in 1915, a German geologist named Alfred Wegener (1880-1930), published a serious book, in German, *The Origin of Continents and Oceans*. He examined similarities in the flora and fauna of the seacoasts of Brazil and Africa, and what was then known about their geology and paleontology. He argued that all the continents had been joined together in a supercontinent, which he called "Pangaea." However, he glossed over important details, and could provide no convincing explanation of the mechanism that would set the continental crust in motion. My professor, whose name I have for-gotten, devoted an hour to pointing out the flaws in Wegener's hypothesis--the improbability that Eurasia, Africa and the Americas were floating about like rowboats on the basalt of the ocean floor.

I wrote my term paper for the course rehearsing my mentor's arguments, and adding some 20-year-old's ridicule of my own. I got an A for the paper, and the course, and I later submitted it for the Geology Prize. I won, and at graduation in 1948 I was mentioned in the ceremonies, and awarded a $100 prize. (In those days, it cost one cent to mail a postcard, and three cents for a letter). My family was so proud of me!

After a hiatus of a few years, I entered Columbia University under the GI Bill of Rights, and began my studies for a Ph.D. in history. I took no geology courses, but I soon began to hear campus stories of the remarkable work being done by scientists of the university's Lamont Geological Laboratory. They, and others at the Scripps Institute of Oceanography, were studying the topography of the ocean floor, the mid-ocean ridges, seafloor spreading, and the symmetrical magnetic fields on both sides of the ridges.

In short, Wegener had been right, and my professor and I had been wrong. You can read about what is now called "plate tectonics" in any high-school or college textbook. Like the plant-breeder Gregor Mendel, Wegener was not recognized as a great scientist until long after his death.

I suppose I should have returned the $100 to CCNY!

CRYSTAL GROWING

To grow crystals you need, first of all, four ingredients: curiosity, patience, time and thoughtfulness.

A mineral garden of many colors can be grown by mixing 4 tablespoons salt, 4 tablespoons water, 4 tablespoons bluing and 4 tablespoons ammonia.

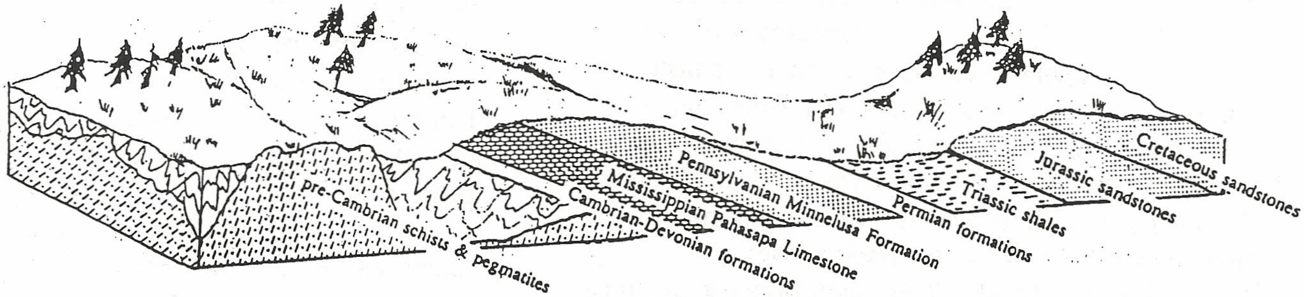
Place some lumps of coal in a bowl, and pour this mixture over the coal. The lumps should be large enough to stick up above the mix. Drop a few drops of different food color around in the mix and set someplace where it won't be disturbed.

To keep it from growing over the sides of the bowl, rub some Vaseline around the top edge of the bowl. In a day or two you will have a very nice mineral garden.

Wind Cave

National Park
RR 1 Box 190 - WCNP
Hot Springs, SD 57747-9430
(605) 745-4600

Geology



WIND CAVE
By Andy and Patricia Caceres

South Dakota has a vast landscape, filled with silence, the chirping of birds and buffalo herds.

The landscape of Wind Cave National Park is formed by various rock types, their structure and how they were weathered and eroded. Gently tilting layers of sedimentary rocks lie under most of the park.

The oldest rocks are exposed in the northwest part. These are schists and pegmatites. The schists are metamorphic rocks which formed under heat and intense pressure during an early episode of mountain-building, about 2 billion years ago. They have almost parallel bands, or foliation, caused by the growth of mica crystals under pressure.

Pegmatites are made up of large crystals of glassy-gray quartz, pink feldspar, silvery mica and shiny black tourmaline. Pegmatite is an igneous rock; similar to granite. It hardened from magma and hot fluids. In places, the pegmatite intruded into the schists. This proves the pegmatite is younger than the schists, but still very old at 1.7 billion years. The emplacement of the pegmatite probably occurred during another mountain-building event.

To the southeast of the igneous and metamorphic rocks, progressively younger layers of sedimentary rocks are at the surface. They span a time from the origin of abundant sea life to about 60 million years ago. During these years, seas advanced and retreated over this region many times. Periods of deposition of sediments alternated with periods of erosion. About 65 million years ago, forces within the earth produced another period of mountain-building, raising the modern Black Hills.

Since that uplift, weathering, erosion and minor uplifting have been shaping the Black Hills. Sediments produced by erosion filled some valleys within the park and spilled outside the Hills to the east, forming layers now visible at Badlands National Park. Rocks more resistant to weathering and erosion, such as the pegmatites, limestone and sandstone, form plateaus. Weaker rocks, such as schists and shales, form valleys. Examples of limestone, sandstone and shale are visible in Beaver Creek Canyon, Wind Cave Canyon and Red Valley. Schists and pegmatites are visible along State Route 87.

Wind Cave formed in the Pahasapa Limestone. This limestone was deposited in a warm shallow sea about 350 million years ago and is composed mostly of fragments of calcium carbonate sea shells. Coinciding with the accumulation of limestone, bodies of gypsum (calcium sulfate) crystallized from the seawater, when arid conditions caused evaporation. Gypsum formed irregular masses within the limestone.

These gypsum masses were unstable. The size of these masses increased and decreased as they absorbed and expelled water. This caused fracturing to occur within the gypsum and in the surrounding limestone. Like thick toothpaste, some gypsum squeezed into these cracks and crystallized. At a later time, water rich in carbonate ions converted all of the gypsum to calcite (calcium carbonate). This set the stage for caves and boxwork to form.

water produces frostwork and popcorn on cave walls and ceilings. Formations that need more water, like flowstone or dripstone deposits (stalactites and stalagmites) are rare in Wind Cave and are limited by the dry climate and semipermeable clay beds above the cave.

Wind Cave is over 300 million years old, making it one of the oldest in the world. Besides extreme age, other features make Wind Cave unique. The cave is large and extremely complex. The 80 miles of known cave (1997) fit under one square mile of land. The boxwork is rare and found in only a few other caves. Geologists have many questions yet to answer before they can fully understand the rich, incredible world below our feet.

Information taken from a National Park Service handout for teachers at Wind Cave.

The Conglomerate (Sept., 2001)

Information taken from a National Park Service handout for teachers at Wind Cave.

SILICON, SILICA, SILICATES AND SILICONE

Dr. Bill Cordua, U. Wisconsin–River Falls

People get confused about the differences between silicon, silicate, silica and even silicone. What is it exactly that we collect, cut and polish?

Silicon is a chemical element, one of the 97 natural building blocks from which our minerals are formed. A chemical element is a substance that can't be subdivided into simple substances without splitting atoms. Silicon is the second most abundant element in the earth's crust, making up about 27% of the average rock. Silicon links up with oxygen (which makes up 55% of the earth's crust) to form the most common suite of minerals, called the silicates. Quartz, feldspars, olivine, micas, thomsonite, jadeite and prehnite are all silicates. There is so much oxygen around that pure native silicon is almost never found naturally.

Silica is a bit trickier concept. It refers to the combination of silicon plus oxygen. The mineral quartz is silica, but so are the minerals tridymite, coesite, cristobalite and stishovite, which are mineral forms of silica that are stable at high temperatures and pressures. All these minerals are also silicates. In other words, quartz is a silicate made of pure silica, but feldspars contain sodium, aluminum, potassium and calcium in addition to silicon and oxygen. Thus, feldspars are silicates but they aren't pure silica.

Geochemists also use the term "silica" to refer to the overall silicon and oxygen content of rocks. This is confusing, but stems from the fact that in rock analysis a sample is dissolved, the solution treated, and the amount of silicon present is determined by precipitating it as silica. So a geologist may say, "This rock is 48% silica." A rockbound will look at the rock and say, "How can that be? I don't see any quartz in it!" Both are right. The rock will not have the mineral quartz because the silicon and oxygen are tied up with other elements to make silicate minerals like feldspar. It's a bit like looking at a cake and saying, "I don't see any eggs in there!" The eggs are cake ingredients but are present in different forms.

Now, what is silicone? It's a synthetic polymer of silicon with carbon and oxygen. It could be in solid, liquid or gel form. It has all kinds of medical uses, such as in antacids, artificial joints, pacemakers and implants of various notoriety, but is not, as far as anyone knows, found in rocks.

Can pure silicon be found in nature? Yes, rarely. Recently Russian geologists were sampling gases from Kudriavy Volcano on the Kamchatka Peninsula. Here they drove quartz tubes into vents jetting out gases of over 900 degrees C. Their tubes filled with minerals precipitating from this gas. Among them were pure silicon metal embedded in masses of salts such as halite. The silicon formed crystals up to 0.3 mm across. It was associated with pure aluminum metal Si-Al alloys and other rare minerals. This find was unusual enough to warrant a note in the prestigious science journal *Nature*.

So unless you are in Russia sampling hot volcanic gases, you can be sure that what you are finding are silica and silicates, but not silicon or silicone.

Ref. M. A. Korzhinsky et al., "Native Al and Si Formation," *Nature* (v. 375, p. 544).

Leaverite News (no date available)