



CEDAR VALLEY GEMS

CEDAR VALLEY ROCK & MINERAL SOCIETY

CEDAR RAPIDS, IOWA

CEDAR VALLEY GEMS

MAY 1994

VOL. 21, ISSUE 9, PAGE 1

Cedar Valley Rocks and Minerals Society will meet May 18, 1994, 7:15 PM, at the AEGON Bldg, on the northeast corner of Edgewood Road and 42nd St. N.E., Cedar Rapids, IA.

Vice-President Sharon Sonnleitner reports Peter Thompson, of Cornell College, will present the program. Mr. Thompson visited Iceland for two weeks last August while on a GSA trip. His presentation, "Geology of Iceland", will focus on the volcanoes, the history and geology of the country.

You may want to borrow a copy of EARTH magazine, July 1994, if you do not have it, and read, "Journey in Iceland, Where the Earth Rips Open." Yes, July is the right month. I do not understand their dating but it is dated July. It may be available on the newstand, \$3.95

Jean Secor and Jack and Jean Zordell will be our hostesses.

HERE AND THERE WITH OUR MEMBERS AND FRIENDS

We extend our deepest sympathy to Neva Abernathy. Her son, Kevin Andrews, passed away Tuesday, April 12, 1994. from complications of diabetes, at the age of thirty-four.

We welcome new members: Verna S. and Leslie E. Bigelow
26 Prospect Place
Iowa City, IA 52246
319-337-3683

Somehow the gremlins got in the program when the new directories were printed. Please make these corrections to your directory. Also, add Bigelow's name to your book to keep it up to date.

Phone numbers either missing, or incorrect.

Susan Cain - 515-277-9150

LeRoy Evans 364-5837

George & Pat Crawford - 849-2302

Jeff Groff 365-4585

Roy Johnson - 1 - 646-6582

Some names were included in the book who had not paid their '94 dues. Some said they would mail them in. Some have. Some have not. We will be scratching some of the names soon. We will double check.

CONGRATULATIONS! CONGRATULATIONS! CONGRATULATIONS!!
to **Dr. Jeff Nekola!!** Wow!! How about that? Fred and Edith will be flying to North Carolina for Jeff's graduation this weekend.

Edith tells me he has a position at the University of Wisconsin, in Green Bay. Isn't that great.? He will be returning to Cedar Rapids with his dad this week. Edith will fly home as she has to be at work on Monday. With a little bit of luck, perhaps we can get him to our meeting Wednesday night.

This summer he will be working some in Chapel Hill, N.C. and some of the time in Green Bay. He will be in Green Bay starting with the fall term.

CONGRATULATIONS to Bill Sonnleitner. He will be graduating from Prairie High in June. (Bill is the son of Sharon and Bill Sonnleitner)
There will be an OPEN HOUSE, in Bill's honor, June 4, 1994, from 3:00 - 6:00 P.M., 4800 Sunset Dr. S.W., Cedar Rapids, Ia
Bill will be going to Iowa State at Ames this fall, where he will be majoring in Electrical Engineering.

Congratulations to Frank and Bertha Ehrenberger on their 50th Wedding Anniversary, April 17, 1994. Frank and Bertha were members of the club for several years - quite a few years ago. We auctioned off their collection of rocks - I believe it was 3 years ago, when they sold their home and travelled for awhile. They are now back in our area.

FIELD TRIP

There will be a field trip to Conklin Quarry, May 15, 1994, at Coralville, Iowa. Meet at the west gate at 9 AM - across from the Day's Inn. Take Exit 242 off I 80 and turn to the north. Please be prompt. The gate will be locked when the group goes in the quarry

Bill Mitchell will be the leader for this field trip. He will plan to take those who can only stay part of a day to the gate around noon. The gate will be locked at all times.

SUMMER PICNICS

June 15, 1994 - Olin, Iowa Fairgrounds

July 20, 1994 - Shawnee Park (can only be reached off F. Ave. N.W.)

August 17, 1994 - Noelridge Park

We will have more details about the picnics in the June bulletin.

(If you have any information you want to get in the bulletin for the summer months - Keep in mind the JUNE BULLETIN WILL BE THE LAST ONE UNTIL SEPTEMBER. As most of you know, May will be our last indoor meeting until September. That does not mean that we do not have a business meeting. We do have a business meeting at the picnics if there is anything that needs to be brought up. Also dates for any upcoming field trips or other activities. Mark your calendar now for the picnics and plan to come out and enjoy a wonderful meal. We have some excellent cooks. Guests are always welcome.

SECRETARY'S REPORT APRIL 1994

Cedar Valley Rocks and Minerals Society met Wednesday, April 20, 1994, at the AEGON Bldg. President Marv Houg presided. Thirty members and one guest, Marie Fisher, were present.

Treasurer Dale Stout gave a preliminary show financial report. He said some bills are out yet and it looks like profits are down, partly because of added expenses for the purchase of the UV light which was needed and the fact that we did not have the food concession. Attendance was 2652, up from last year. Receipts were \$4695.74, and expenses approximately \$3154.02 for a preliminary report. Report approved as given.

Alberta Cray made a motion we give the same scholarships as last year - \$1000. to Cornell College and \$1000. to University of Iowa. Seconded and approved.

Dale reported he has the discount forms for Lapidary Journal. The subscription is \$24; with the discount it will be \$18., or two years for \$30.75. To renew your subscription, or a new one, see Dale.

Show Comments - Jim & Myrna Shetterly said while attending other shows, they have come to realize how professionally our show is run. Marv said he heard many good comments. Show Co-ordinators Marv Houg and Sharon Sonnlitner were thanked with round of applause.

Dale made a motion we elect Marv and Sharon as Show co-ordinators for 1995. Seconded and carried.

Alberta reported that after talking with the school Board and the AEA, it does not seem feasible to buy books for the schools because of the number of schools in the area. They indicated "hands on materials" would be more helpful and are needed. Alberta will get more information. Marv suggested we make a video for the home school groups. The committee will continue to study this matter.

FIELD TRIPS - Conklin Quarry, Sunday, May 15. Be at the west gate at 9 AM Sharp. Bill Mitchell will be in charge. Members wanting to go to Muscatine to hunt agates, contact A. J. Johnson. A GSI field trip will be Sunday, April 24 at 8 AM. Marv read the itenary. Membership for GSI is \$5. a year. The address is GSI, Secretary/Treasurer, 109 Trowbridge Hall, Iowa City, IA 52242-1319.

Alberta will reserve parks for the summer picnics. Millie Smouse invited us to come to Olin for one of our picnics.

Marv reported the MWF insurance has been paid.

Marv displayed the Jeffrey L. Emde rock collection from Arizona, and asked for suggestions as to wishes of the club. Emde, one of our past scholarship students, donated this material to the club. Pappé Phillips made a motion we keep the collection to display at shows. Seconded and carried.

Marv passed around micro-mineral specimens which were donated by Allen Mitchell at the show. There was a discussion as to how to use them. It was thought we might use them in the classroom video, or we might set up microscopes at the show so guests could view them. No decision made.

Sharon Sonnlitner will check if we can use the AEGON Auditorium for Dr. Glennister to give his "Devonian Fossil Gorge" program in May on a Monday or Wednesday evening. We will invite the public. We will have refreshments and ask members to bring a dozen cookies.

Dale Stout made a motion we give \$100. to the Environmental Council programs for 1994. Sharon seconded. Motion carried. (More about this on another page.)

Sharon announced the program for the regular May meeting will be on Iceland.

The fall auction was discussed. Dick and Millie Smouse and Alberta Cray have material to sell. Marv suggested the sellers think about a date and a location and we will discuss it at the May Board meeting.

The meeting adjourned.

Respectfully submitted, Leslie Blin, Secretary

The program was a video "Dinosaurs and Whales." The film showed them digging whales and dinosaurs in Peru, which were then loaded on huge trucks and taken to South Dakota for preparation.

Leslie Blin

Typed Done
BITS FROM THE MAY BOARD MEETING

May 4, 1994

Marv reported he had received our insurance certificate from the MWF. Coverage for shows, auctions and other activities were discussed. Tabled until we get more information.

The Auction tentatively scheduled for October, was discussed. It was decided to have just a ONE day auction. We will move in on Friday and have the sale Saturday. Dick and Millie Smouse will be selling the bulk of their collection. If it appears there is time, Bud and Alberta Cray and Norman and Alice Brown will also offer some material. Alberta was asked to phone Ely and see what dates they have open. Smouses were asked to make a list of their materials so we can determine about how much time it will take to sell theirs and also so we can get the flyers printed.

Summer picnics - Dick & Millie have made reservations for the June 15th picnic in Olin at the Fairgrounds. Alberta will make reservations for July and August in the Cedar Rapids area.

There was a short discussion on the 1995 Show. Marv asked Pappé Phillips and Larry DeSotel if they could go out to the Teamster's Hall and measure the size, the openings and where the outlets are. A. J. volunteered to help.

There was further discussion on the video and the "hands on" specimens for the schools. We will continue to study this project. Your thoughts and input will be helpful.

The program for Monday night with Dr. Glenister was discussed. The telephone committee, Gladys Zobac and Leslie Blin have called the membership. Some of the members will bring cookies. Sharon will pick up the punch.

Alberta Cray

A U C T I O N

The date is set. CEDAR VALLEY ROCKS & MINERALS SOCIETY will hold an auction at the AMERICAN LEGION BUILDING, Ely, Iowa, October 29. Move in and set-up day will be October 28.

None of the details are available at this time. Things to be worked out are the hours, food service and the auction listing. We will plan to have a little more information for the June bulletin. A flyer will be mailed sometime this summer. MARK YOUR CALENDAR NOW!!

LOOK WHAT'S HAPPENING

- MAY 20 - 22, 1994 GREATER ST. LOUIS ASSOCIATION OF EARTH SCIENCE CLUBS - SHOW, Gateway Center, Collinsville, IL
- May 20 - 22, 1994 MIDWEST MINERALOGICAL & LAPIDARY SOCIETY of DEARBORN, MICHIGAN SHOW. Dearborn Civic Center, Michigan & Greenfield, Dearborn, Michigan. museum exhibits, demonstrations and lots of fine dealers.
- May 23 - 25, 1994 CHICAGOLAND GEMS & MINERALS ASSN, DuPage County Fairgrounds, 2015 Manchester Road, Wheaton, IL Sat. & Sun. 10 - 7; Mon. 10 - 5. Lots of fine dealers and a swapping area.
- June 4 - 5, 1994 - LaCrosse COULEE ROCK CLUB - SHOW with Viroqua HERITAGE DAYS. Exhibits & displays from 3 universities. Dealers, demonstrations, displays and lectures. Many other events in connection with Viroqua HERITAGE DAYS.
- June 4, 1994 FOR SALE - LIFETIME COLLECTION 9 - 4. Rough rocks, loads of cabs, machinery, material from U.S., Mexico, & South America, Albert Zaudtke, 2597 River Road, St. Croix Falls, WI 54024 1-715-648-5390
- June 17 -19, 1994 - INDIANA SOCIETY OF PALEONTOLOGY - SHOW/SWAP Bloomington, Indiana. MAPS meeting on Sat. (I seem to have misplaced my flyer. If anyone has one, please bring it to the meeting) This is a huge swap. Something for everyone
- July 22 - 24, 1994 ROCKY MOUNTAIN FEDERATION, Rushmore Plaza Civic Center, Rapid City, S.D.
- September 2 - 4. 1994 - MIDWEST FEDERATION 1994 CONVENTION - SHOW. Century Center, 120 S. St. Joseph St., South Bend, IN (More info next month)

ROCKS AND FOSSILS OF DEVONIAN FOSSIL GORGE

Monday, May 9th, Dr. Brian Glenister gave a slide presentation, Rocks and Fossils of Devonian Fossil Gorge, (Coralville Lake) and Their Modern Counterparts in the Caribbean Sea. The program was held at the AEGON USA Building, in the Auditorium, at 7:30 P.M. The program was free and open to the public, and was sponsored by Cedar Valley Rocks and Minerals Society. A very interesting and informative program with great slides. The 'Question and Answer' period reflected there was a lot of interest in the Devonian Fossil Gorge.

We were very pleased with the turnout. We had only a little more than a week to get the word out. We had well over sixty-five people in the audience; and were privileged to have Mildred Adams Fenton, author of THE FOSSIL BOOK, in attendance.

We hosted a social hour with cookies and punch.

Our special thanks to Dr. Glenister for taking time to present this program.

A BIG Thank You to Bill Sonnleitner for making the arrangements for the Auditorium at AEGON.

*needs to type
on min*

LINN COUNTY ENVIRONMENTAL COUNCIL

The Linn County Environmental Council (LCEC) is composed of more than 50 clubs and agencies in Linn County. The purpose of the Council is to promote cooperation and communication between groups with an interest in our natural resources.

The Connections Program, initiated last year by LCEC, offers a continuing lecture series that is intended to encompass a variety of topics to connect students and the public to outstanding members of the scientific community. This series also offers people an opportunity to learn more about current environmental issues. Each speaker presents programs to area schools and a lecture that is free to the public.

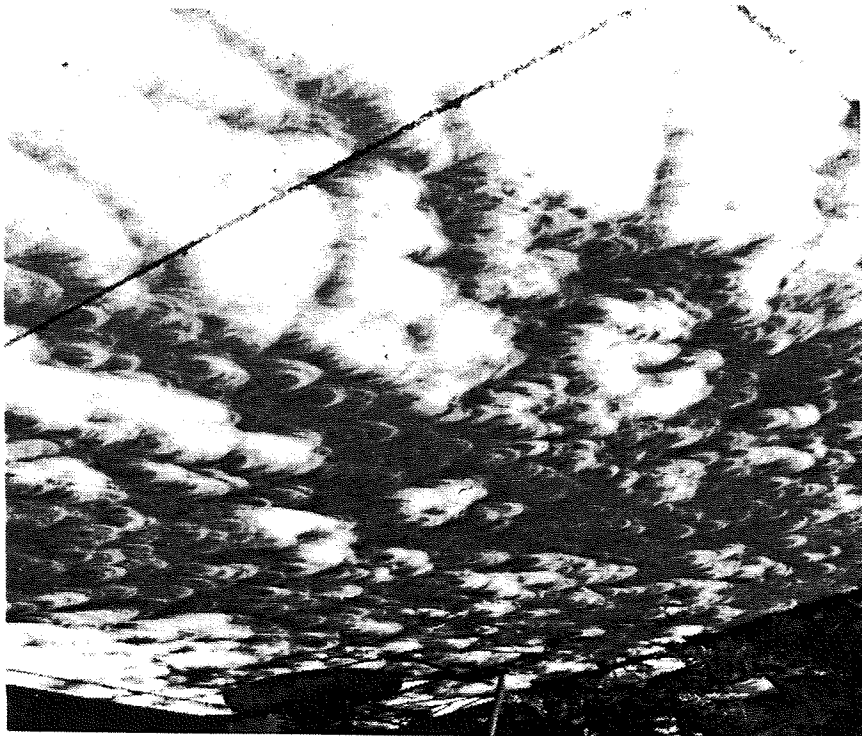
The next program will be held in October. We will plan to tell you more about that in the September bulletin.

Quite a few of our members were seen at last fall's program which was on dinosaurs. Because of lack of information, we missed the program in April.

(This is the organization to which we are donating \$100.00. I believe this will place us on the list of Supporters.)

SOLAR ECLIPSE

Solar Eclipse, May 10, near maximum coverage. These pictures were taken with a 35mm camera, 200 speed film, and 50mm lens. The photo on the left shows multiple images of the eclipse created by the sun shining through the leaves of a tree. The other photo shows the direct view of the eclipse. These photos were taken by Sharon Sonneleitner.
Sharon



SAFETY

HOW SAFE IS YOUR SHOP?

from The Calgary Lapidary Journal
via SCFMS Newsletter and T-Town Rockhound

How often do you think of the quality of air and safety of the environment in your lapidary shop? With the lapidary season upon us, many of us will be spending a lot of time in our workshop hideaway. Perhaps a run down of areas of potential danger is in order.

We are safety conscious when climbing a ladder, lighting a fire, using volatile fluids or driving. Are we as safety minded in our shops? Have you stopped to think about all the fumes and gases that come from the chemicals and materials we work with? I think not.

Many aspects of our hobby have some inherent danger in dust or fumes that develop with their use. The following list identifies many known substances that have toxic characteristics. This list, while not complete, identifies a large number of the potential problems. When using any item listed, make sure you use power ventilation...a bathroom or kitchen exhaust fan generally works well for this. Remember, you need a fresh air intake supply for these fans to work well.

Here is the list:

ACETONE - an industrial type solvent containing harmful vapors.

ACETYLENE - an asphyxiant.

ALCOHOL (wood) - highly flammable.

ASBESTOS - loose fibers when inhaled can cause asbestosis.

BENZINE - (gas, naphtha, etc,) - vapor may affect the respiratory and nervous systems.

BUTANE - has an anesthetic like effect causing headache and drowsiness.

CARBON TETRACHLORIDE - flammable, toxic and an irritant.

CHLORENE - restricts the air passages of the lungs.

HYDROGEN SULFIDE - by product of sulphur and water. DEADLY POISON!!

LEAD - is known to enter the body from dust, fumes, and water. It can damage the brain and neuro-muscular system.

MANGANESE - in dust or vapors can damage the nervous system.

QUARTZ, AGATE, SANDSTONE, GRANITE, CHERT, FLINT - all are of the silica rock family. The dust from this family contributes to silicosis of the lungs.

PROPANE - highly flammable and toxic.

SPAREX - is a diluted acid and should be handled accordingly.

GOLD PLATING SOLUTIONS - those with a cyanide base form deadly hydrogen cyanide gas if mixed with another acid. Use plating solutions that are cyanide free.

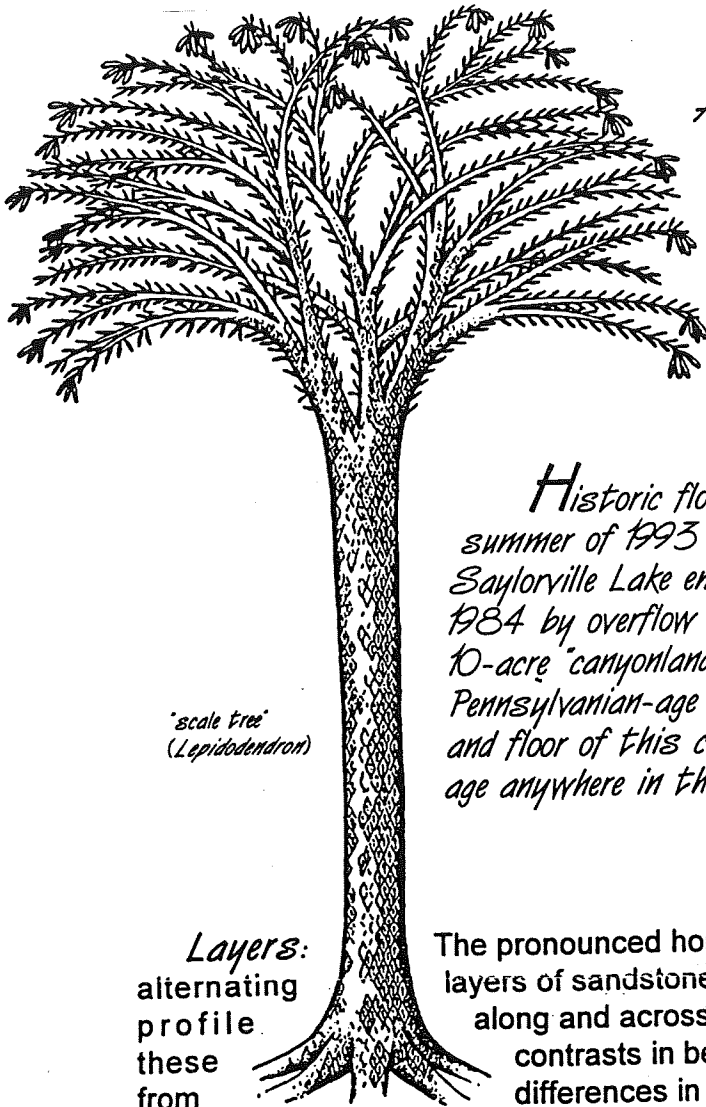
STYROFOAM - toxic gases are released when heated or burned.

ABALONE - grind and polish only when wet. Be aware that any odor detected is highly toxic.

MALACHITE - work wet as the dust created when working dry is toxic.

While it is not healthy to fear everything, one should be aware of hidden dangers in apparently innocent looking materials that we all use extensively in our hobby. If you are using a material that is new to you...read the labels and heed any warnings. We want all lapidaries to remain a healthy lot and continue to have active, long lives!

via THE SHAWMISH ROKTAWK



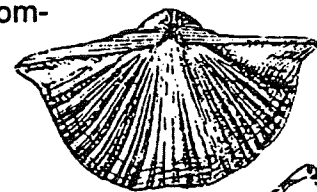
'scale tree'
(Lepidodendron)

Layers:
alternating
profile
these
from

The pronounced horizontal strata are sedimentary rocks, consisting of layers of sandstone, shale (and mudstone), limestone, and coal. The along and across the spillway channel is strongly influenced by contrasts in bedrock types. The stepped appearance results differences in their resistance to erosion. The more durable sandstones and limestones form prominent ledges. Softer shales and mudstones beneath the overhangs were more easily eroded by the churning floodwaters .

Composition: Shales, the most common rock type, are composed of easily split layers of clay and are quite colorful, ranging from light gray to greenish to black, sometimes with red or yellow mottling. Mudstone, another gray fine-grained rock, shows no visible layering. The limestone deposits are hard, thin and gray, sometimes occurring as irregular rounded lumps ("nodules") within more shaley materials. Sandstone is more granular, like sugar, and is usually light brown. The coal is black and light-weight, composed of alternating shiny and dull layers with many vertical fractures, often filled with the minerals pyrite ("fool's gold") and calcite (calcium carbonate).

Ancient Environments: These various bedrock deposits formed during fluctuating sea levels across a low coastal plain 310 million years ago. At this time, the North American continent straddled the Equator. The result is a series of shales, sandstones, and coals



brachiopods



*A Visitor's Guide to
Geologic Features
at the Saylorville Lake
Emergency Spillway*

(in the lower 50') that were deposited in fresh water, along a lush, tropical river system that included delta channels and peat accumulation in backwater swamps. The mudstones, containing mud cracks and traces of plant roots, show where ancient soils developed. Alternating shales and limestones in the darker colored, upper 20' represent a sharp contrast, a deepening of the sea — the earliest widespread invasion of Pennsylvanian seas into the midcontinent. The prominent rock layer at the top of the canyon is a sandstone, whose grains were deposited in "cross-bedded" patterns, or parallel sets of straight sloping lines produced by shifting river currents. Giant ripples (east side of canyon) are seen as steep wavy surfaces on top of the sandstone, expressing prolonged current activity. The sandstone indicates a lowering of sea level and a return to river and delta building environments.

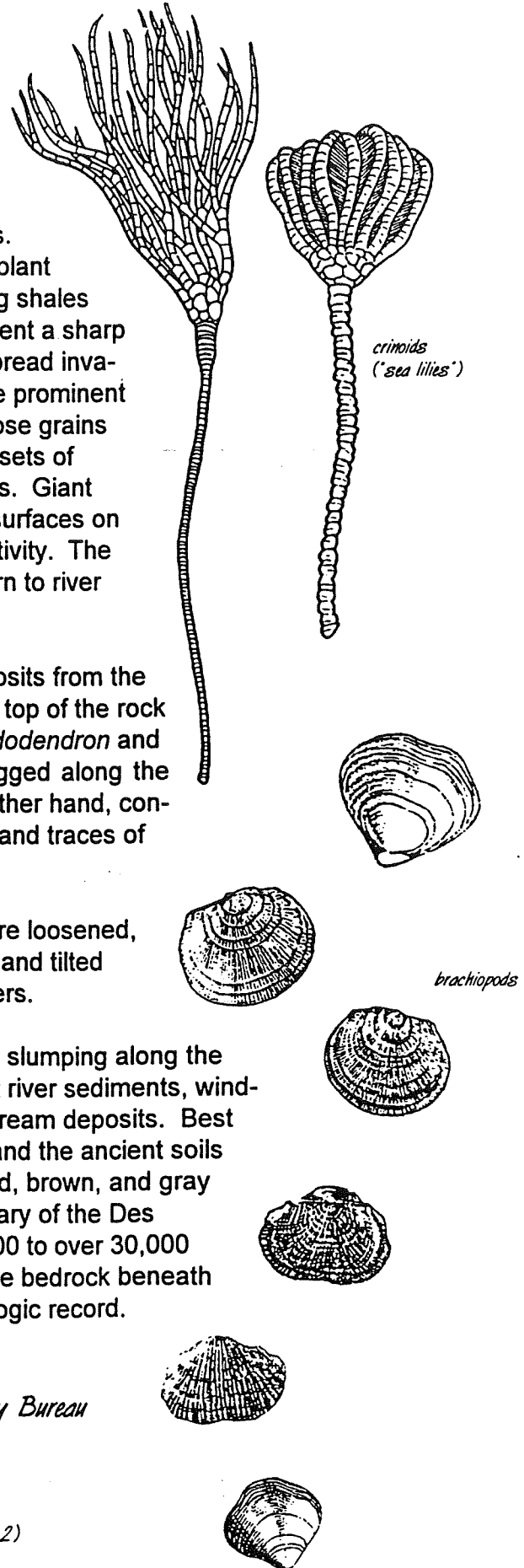
Fossils: Fossils help to separate the marine deposits from the fresh-water deposits. The sandstone bench along the top of the rock sequence contains plant and "scale tree" fossils (*Lepidodendron* and *Sigillaria*) and long straight marks made by logs dragged along the ancient river bottom. The marine limestones, on the other hand, contain abundant brachiopod shells, some crinoid stems, and traces of animal burrowings just beneath the sea floor.

Flood Evidence: Large blocky slabs of bedrock were loosened, toppled, and shoved downstream. These overlapping and tilted masses of rock demonstrate the force of the floodwaters.

Glacial-Age Deposits: The softer deposits seen slumping along the steep canyon sides above the bedrock include ancient river sediments, wind-blown silt, ice-deposited materials, and more recent stream deposits. Best observed south of the road crossing, these materials and the ancient soils weathered into them are seen from this distance as red, brown, and gray colors. The glacial-age deposits fill an ancestral tributary of the Des Moines Valley, and they range in age from about 10,000 to over 30,000 years old. The contact between these deposits and the bedrock beneath marks a time gap of over 300 million years in the geologic record.

Prepared by
 Iowa Department of Natural Resources, Geological Survey Bureau
 109 Trowbridge Hall, Iowa City, IA 52242

Illustrations:
 Brachiopods from "Invertebrate Fossils" by Moore, Lalicker, & Fisher (1952)
 Others by the Geological Survey Bureau



Award-Winning Article

TURNED TO STONE

In my own way, I find science as being very complicated. A simple procedure such as fossilization should not be difficult to understand by anyone. After all, fossils are the remains of plants or animals, or the record of their presence, preserved in the rock of the earth. In fact, all remains or traces of plants and animals which have lived before the present geological period can be called a fossil. Since probably 99+% of all life past and present has vanished without leaving even the slightest trace, it takes special circumstances to preserve a fossil.

At this point, things get complicated. Part of the fossilization process is petrification, depending upon who your professor was. Both words have the same meaning, that is, literally, *turned to stone*. On the other hand, do you prefer to use the words *silicified* or *agatized*? Or, how about *mineralization* or *mineral replacement*, *permineralization*, *pyritization*, *carbonization*, or *calcification*? Maybe your fossil is called a pseudomorph? Do these terms all denote the same thing? (They do, in a way!) Do they all play a role in the process of fossilization? Let me share with you the meanings of all these different terms.

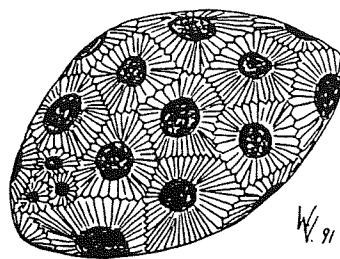
Petrification or Petrification

As I mentioned before, these terms mean *turned to stone*. Not all fossils are petrified. We speak of a fossil as petrified only when additional minerals have been deposited in pores or cavities in fossils, or when the fossil is entirely replaced by other material. A fossil can be buried and remain chemically unchanged for millions of years. Under such circumstances the fossil is said to have original preservation rather than being petrified. Petrification can take place in two related ways, one of which is permineralization.

Permineralization is the process of fossilization in which the original hard parts of an animal or plant have additional mineral materials deposited in their pore spaces. Organic substances decay, while waters containing dissolved mineral matter soak into every cavity and pore of the hard structures. There the minerals are deposited, producing fossils that still contain a good deal of their original solid material. Permineralized wood, for example, contains mineral material and the original wood. If the mineral material dissolves, the original wood with its structural features, remains.

Replacement is another way in which a fossil becomes petrified with the assistance of minerals. Replacement takes place when water dissolves the original hard parts and replaces them with mineral material. This process preserves the appearance and cell structure of the original tissue. If the minerals which have replaced the wood, for example, are dissolved away, no wood remains, unlike in the case of permineralization.

Replacement takes place not only in the fossil world, mineral crystals are also subject to replacement. Suitable environmental conditions and suitable chemical agents will cause even the most stubborn mineral to become replaced by other minerals, ion by ion.



Petoskey Stone — fossil replacement of calcite retaining structure details of *Hexagonaria* coral (Devonian period)

Pseudomorphs: The word means *false form*. The term is also often used to describe a particular process in petrification and mineral replacement. There is a very thin line between replacement and pseudomorphism.

In the mineral world, a pseudomorph is formed when a crystal is dissolved out of its enveloping matrix and its vacant space is filled with another substance without changing the original crystal form. The word "after" is usually used in the phrase that indicates which mineral came first and which came second. For example, an anhydrite crystal is covered by quartz. Then, the anhydrite dissolves out, leaving an empty space shaped like the anhydrite, within the enveloping quartz. Finally, a new mineral, such as prehnite, enters the cavity taking the shape of the anhydrite.

Such a process can take place with fossils. A piece of wood is buried in mud or sand that hardens around it. The organic material of the wood then dissolves or decays, leaving behind a mold which can be filled with minerals which take the original shape of the wood. Only the outside of the specimen looks like wood. The inside may be banded agate or not resemble wood at all. In the latter case, the specimen is labeled as "agate pseudomorph after wood."

If you think things are beginning to get complicated, just wait! This is just the beginning!

Pseudofossils: The word *pseudofossil* is sometimes used for a natural object, structure, or mineral of organic origin that may resemble or be mistaken for a fossil. Sometimes stains on rocks are produced due to the presence of decaying vegetable matter. These stains often resemble leaves. Dendrites, usually composed of manganese dioxide, hematite or pyrite, are branching mineral incrustations and can be mistaken for fossil mosses or ferns.

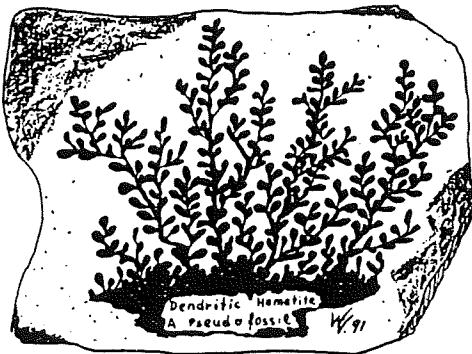
Then there are — **Polymorphs:** *Polymorphism* is the phenomenon whereby a substance (element or compound) may exist with several distinct crystal structures depending upon temperature and/or pressure. The classic examples of this phenomenon are diamond and graphite, both examples illustrating polymorphism in carbon. This difference in the crystal structures of the two

substances is responsible for the hardness of diamond and the slipperiness of graphite. Minerals which have two crystal structures are called dimorphic. Those which have three are trimorphic, and those with more than three are called polymorphic, i.e., many forms. The crystal structure assumed by a certain species may be ideal under the conditions prevailing at the time of growth. However, under different conditions, another structure may be favored by the crystal ions or atoms. As a result, they accordingly shift slightly from their former position.

When no change in chemical composition of the material is involved, the several distinctive crystal structures are called polymorphs. Diamond and graphite are good examples of materials which have the same composition, but have structural characteristics that are differently stable under varying conditions of temperature and pressure. Diamond is stable in regions of high temperature and pressure. Graphite is stable in regions of low temperature and pressure. Polymorphism is very rarely found in the fossil world.

Then, believe it or not, there is talk of the existence of **Paramorphs!**

A *paramorph* is really a pseudomorph with the same composition as the original crystal. The mineral has simply rearranged its atoms into a different configuration; that is, one that no longer coincides with the original crystal outline. The most familiar example of a paramorph is calcite after aragonite. Paramorphism is definitely linked to the phenomenon of pseudomorphism in which a mineral is substituted not by one of its polymorphs, but by a totally different mineral with a different, though perhaps similar, chemical composition. Paramorphism is also extremely rare in the fossil world.



Dendritic hematite: a pseudofossil

To make matters worse, there are also those **Pseudo-Pseudomorphs**. *Pseudo-pseudos* are those objects with no orientable shape, since they are not regulated by the laws of crystallization. These things preserve only the form of an empty space lined with crystals.

Silicification or Agatization: These words are often used to describe the process of fossilization. Both words mean the same thing, i.e., that the original components of an organism are replaced by quartz, chalcedony, or opal. In the latter case, the word *opalized* is used, as, for example in the case of *opalized wood*.

Calcification: When the original hard parts of an animal or plant are replaced by the mineral calcite (calcium carbonate), the alteration process is known as calcification. If the original hard parts of a fossil, such as shells, are buried for millions of years and remain chemically unchanged, they are often preserved in a calcified state.

Pyritization is a process of molecular replacement, just like silicification. However, in this case the replacing minerals are pyrite or marcasite.

Carbonization occurs as a result of action by chemicals, bacteria, heat or pressure in the absence of oxygen. For example, burial of a specimen at the bottom of a bog or a swamp provides just such anaerobic conditions. The absence of oxygen in these cases prevents the normal decay of delicate tissue, such as that of the soft-bodied animals and of leaves, into carbon dioxide and water vapor (both gases, and thus not left behind). Instead, these animal and plant remains slowly lose the oxygen, hydrogen, nitrogen, and sulfur from their cellulose and proteins, while the carbon that also was there as part of these tissues remains behind.

Carbonized plant material is often found in various stages of carbonization, and at its extreme, appears as a shiny black film showing more or less distinct forms and/or structure of the original material. Carbonization is present in the material found at St. Clair. (The white coating on top of some of the material found there is pyrophyllite, a silicate mineral, which entered later in the fossilization process, after the carbonization was complete. The pyrophyllite is not part of the preservation process because if it is scraped away, the imprint of the leaf is still there.) Carbonization, on the largest and most extreme scale, is coal.

If, at this point you are still reading, I will assume that you must have been truly fascinated to learn about the close relationships between some of these terms. On the other hand, perhaps you had nothing better to do, in which case I suggest a metamorphosis to stamp collecting. Do this before you permineralize, calcify, agatize, silicify, or, God forbid, turn into a pseudomorph, or worse yet, into a pseudo-pseudomorph. Do it before you fossilize!

REFERENCES:

- J. Sinkankas, *Mineralogy*, Van Nostrand Reinhold.
 A. Mottane, R. Crespi and G. Liborio, *Simon & Schuster's Guide to Rocks & Minerals*, Simon and Schuster.
 P. Arduinin and G. Teruzzi, *Simon & Schuster's Guide to Fossils*, Simon and Schuster.
 W. Schumann, *Der Neue BLV Steine und Mineralienführer*, BLV Verlag.
 C.L. Fenton and M.A. Fenton, *The Fossil Book*, Doubleday.

Illustrations by the author.

– Wolfgang Vogt, NJPS Paleontograph, issue V/91,
 via the AFMS Newsletter, 10/93

(ED. NOTE: The above article by Wolfgang Vogt won the Eastern Federation's trophy as the best educational article in its 1992 bulletin editors contest. It placed third in the AFMS contest in the adult article category.)

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