



CEDAR VALLEY GEMS

CEDAR VALLEY ROCK & MINERAL SOCIETY

CEDAR RAPIDS, IOWA

CEDAR VALLEY GEMS

MARCH 1995

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**ATTENTION; NEW LOCATION FOR THE 1995 SHOW - TEAMSTERS UNION HALL,
5000 J. ST. S.W., CEDAR RAPIDS, IA**

Cedar Valley Rocks and Minerals Society will meet March 15, 1995, 7:15 pm at the Life Investors/AEGON BLDG, corner of 42nd St. and Edgewood Road NE, Cedar Rapids, IA

The program will be a video on collecting gems and minerals.

Hosts will be Dale Stout and Pappé Phillips.

If possible, we will have the new membership directories ready. There may be a chance to preview some of the books which will be available at the show. Because many of you are so busy at the show, you do not get a chance to look at the books. This should be a good opportunity.

Please plan to attend this important meeting to get the last details on the show and find out what you can do to become a part of this very BIG SHOW!

SHOW NEWS

Plan to meet at TEAMSTERS HALL, 5000 J ST. S.W. at 9:30 AM, Friday, March 17, 1995 to help set up tables and booths. If you have an extra pair of scissors, throw them in your 'tack' box with those other necessities for setting up your exhibit - windex, paper towels, thumb tacks, labels, etc. The scissors will be used to cut the white paper as we cover the tables. You may want to put your name on your scissors.

The club will furnish sandwich makings, coffee and lemonade or another cold drink, for lunch for the workers.

Some of the dealers will be moving in around 1 PM. We will want to be ready and have the tables covered. Some dealers will use their own table coverings. Power cords must be laid before the tables are covered..

Friday night around 6 PM, we will have a BIG, BIG POTLUCK SUPPER. It is our custom to invite the dealers, as our guests, to share potluck with us. We ask each member, or family, to bring 2 or 3 large covered dishes - (your favorite recipe) We will have more dealers than we had last year. It will take a lot more food.

If you are not able to help during the day Friday, fix that favorite casserole and come on out and enjoy supper and fellowship with us.

The Pebble Pit and Silent Auction booths still need material.

The hostess table, book booth, blacklight booth and some others still need helpers. If you can give a little time - YOU ARE NEEDED.

PEBBLE PIT - We have hundreds of kids at the show; it will take lots and lots of material. This can be pretty stones, tumbled stones, fossils, crystals, minerals, etc. Yes, they have sold older back issues of some of the

rock magazines. These cold, wintry days and evenings are good times to high grade your collection (before we get into the collecting season again). Those rejects will be just fine for the Pebble Pit.

SILENT AUCTION - Richard Smouse, chairman, is requesting some good specimens or books to sell at the silent auction table.

Please be sure to tell your friends and acquaintances that we are moving to a new location. In checking on memberships, Gladys Zobac, learned that several of you were unaware that the show will be at a new location.

Mary Haug has a good supply of flyers - your help is needed to help get them posted, or handed to the people in the various groups with which you come in contact. Remember the show proceeds are used for scholarships for Cornell College and the University of Iowa. Everyone's help is needed.

AUCTION NEWS

Mark your calendars now. The auction will be Saturday, October 21, 1995, at the Legion Hall in Ely, Iowa. There will be large crystal specimens, petrified wood, plant fossils and lots more. Possibly a large fluorescent collection.

A list will be available when more is known.

HERE AND THERE WITH OUR MEMBERS

Jeff Nekola has an article in the current Wapsi Almanac. Sorry, I glanced at it one day while I was at the museum. Didn't write it down then. The Wapsi Almanac comes out, I believe, once a year. It is \$5. per issue.

Ray Shedenhelm was planning to have surgery on his knee about the time we had the indoor field trip to George Vacik's.

Roy Johnson had knee surgery a short time back. He is recovering nicely and was able to be at Sonnleitners' to help with the egg cartons.

Gladys Wanek tells me **Reese Greer** had by-pass surgery - she thinks it was the latter part of 1994. She also said a developer has purchased Greer's property for the development of a mall and Greers will be moving.

Jim Shetterly is about to take that BIG STEP in to retirement - sort of semi-retired now. If I understood correctly, he will be through April 1, 1995. What a beautiful time of the year to retire.

Gladys Wanek says April 1, will be a sleep-in day for her - or shortly thereafter. "Whatever, I will be ready to roust about to rocky shores or whatever if anyone is interested." Another retiree.

Looks like we are all getting older.

INTERESTING MWF NOTES:

Did you know that there are 182 clubs with 9,576 adults and 888 youth members in the Midwest Federation? The three largest states for the number of clubs are: Michigan 33, Illinois 30 and Ohio has 29 local organizations.

The most requested programs over the last four years are a slide program on Lake Superior Agates and a video on the Cave of the Winds. The Federation library is averaging 250 program requests per year.

via SMOKE SIGNALS

(I thought you might be interested in the fact about the program on Lake Superior Agates. Maynard Green, who developed this program, will be here at our show to present this program for us. He will give the program once Saturday afternoon, Saturday evening and Sunday afternoon. Don't miss it.)

(Cedar Valley Editor)

SECRETARY'S REPORT - FEBRUARY 15, 1995

Meeting called to order by Marv Houg at 7:15 PM. with 20 members present.
Treasurer's Report Read. Moved, seconded and accepted.
Secretary's Report, as published in the newsletter, moved, seconded and accepted.

Alberta Cray brought up reimbursement for the Flint knapper who will be demonstrating at the Show. We agreed to pay him the same as last year.

Marv read a letter of thanks from Floyd Dopler Jr. and the BlackHawk Gem & Mineral Club thanking us for inviting them on the last Buffalo Quarry field trip.

Larry DeSotel informed the Club that on March 13, 1995, that he will be setting up a display at Cedar Rapids Public Library.

An ad for the show was approved for the Waterloo Courier up to \$25.00. Also Bill Mitchell is checking on an ad in the Iowa City Press Citizen.

Al Johnson made a motion to have the 1996 show on March 23-24, 1996. Approved unanimously.

Dick Smouse made a request for items for the Silent Auction. Anyone wanting to contribute can contact Dick or Millie.

Marv will place order with the US Geological Survey. Blane Phillips & Tom Whitlatch will make arrangements to pickup the order.

Security was discussed. \$15.00 per hour is the rate for a uniformed police officer. Larry Desotel moved to pay for officer during show hours. Seconded & approved unanimously.

The field trip to George Vacik's and Iowa Hall at U of I was postponed till Sunday February 18.

Motion to adjourn made by Dick Smouse at 9:10 PM approved unanimously.

Respectfully submitted, Tom Whitlatch

SECRETARY'S REPORT - BOARD MEETING FEBRUARY 8, 1995

Meeting called to order by Marv Houg with 15 members present.

Bob Sweet had price for rental of a generator: \$54.95 a day for a 9000 Watt with 2 20 Amp, 1 30 Amp circuits. This should provide sufficient power. Bob also will check on security by officers from ADM.

Sharon and Bob will check on overnight security and securing the generator.

The food providers at the Union hall have all homemade food with good quality. Motion to let them handle the food vending was made by Bob Sweet, seconded, vote unanimous for approval.

Pot luck for Friday night before the Show was discussed, with recommendations to ask club members to bring lots of food.

It was brought up that TV was another mode of advertising that needed to be researched. Marv Houg said he would check on prices for an ad.

Insurance was discussed. We need to get the dates of expiration.

Sharon Sonnleitner would check on dates available at the Union hall for next year's show.

Alberta Cray & Alice Brown were asked if they wanted an auction this fall so a date can be set before the Show so we can advertise it at the show. Dates that were possible were October 7 & 8th or October 21st & 22nd 1995. Also, Alberta will call the Legion hall in Ely to check on dates they have available.

Programs for the show were set for time and day: Paul Garvin is giving only one talk at 1:00 PM Saturday, while Maynard Green will give two talks, the first at 2:30 PM Saturday and the second on Sunday at 1:30 PM.

Al Johnson moved to adjourn. Seconded and carried 9:15 PM.

Respectfully submitted, Tom Whitlatch

HERE'S WHAT'S HAPPENING

- March 11-12, 1995 GEODELAND EARTH SCIENCE CLUBS - SHOW, Western Ill. University, Student Union, Macomb, Ill., Sat. 10 - 7; Sun. 10 - 5.
- March 18-19, 1995 CEDAR VALLEY ROCKS AND MINERALS SOCIETY - SHOW, Teamster's Hall, 5000 J. St. S.W., Cedar Rapids, IA. 9am - 6pm; 10am - 5pm
- March 24-26, 1995 ROCK HOBBY CLUB OF GREATER ST. LOUIS - SHOW, Machinists Building Auditorium, 12365 St. Charles Rock Road, St. Louis, MO
- March 25-26, 1995 LINCOLN GEM & MINERAL CLUB - SHOW, Pershing Auditorium, 15th & N St., Lincoln, NE Sat. 9 - 7; Sun. 10 - 5.
- April 1-2, 1995 FULTON COUNTY ROCKHOUNDERS - SHOW, Wallace Park, 250 S Ave. D, Canton, IL
- April 7-9, 1995 MID AMERICA PALEONTOLOGY SOCIETY (MAPS), National Fossil Expo XVII, Western IL University, Macomb, IL. Fri. 8-6; Sat. 8-5; Sun. 8-3.
- June 23-25, 1995 LAWRENCE COUNTY ROCK CLUB - SHOW & SWAP - Buying Selling & Trading, Monroe County 4-H Fairgrounds, Bloomington, IN Fri. 8 - 7; Sat. 8-7; Sun. 8-4. Camping \$6. per night. Bring your own tables - \$2. per front foot space charge. Reservations taken when number of feet requested and money accompanies reservation. Space reserved according to postmark. No telephone reservations. This is a really big event.
- September 23-24, 1995 AUSTIN GEM & MINERAL SOCIETY - SHOW, St. Edwards Community Center, Austin, Minn
- October 13-15, 1995 MICHIGAN MINERALOGICAL SOCIETY - MIDWEST FEDERATION CONVENTION AND SHOW, Detroit, Michigan
- October 28-29, 1995 BLACKHAWK GEM & MINERAL CLUB - SHOW, Milan Community Center, Milan, Illinois

NEXT CONNECTIONS PROGRAM - APRIL 10 - LINN COUNTY ENVIRONMENTAL COUNCIL

In addition to the public program, the Wolf Center will be giving presentations in local schools on Monday, April 10. If you are interested in having the Wolf Center staff present a program at your school please call Dennis Goemaat at 398-3505 for more information. In addition, students from other schools are welcome to attend the Washington High School presentation. Call Bill Desmarais at 398-2161 if you know of a teacher or student who would like to attend or need additional information.

WOLVES and HUMANS; COEXISTENCE and CONFLICT

Monday, April 10, 1995, 7:00 p.m.

Ballantyne Auditorium - Kirkwood Community College

This program will explore the historic relationship between wolves and humans. This relationship has resulted in the wolf being depicted in fables and myths as a devious villain. Today, more is being learned about this social wild canine and its role in the ecosystem. In the lower 48 states, isolated wolf populations have survived in northern Minnesota, Wisconsin, Michigan, Montana and Idaho. Ninety-five percent of these wolves are concentrated in northern Minnesota near Ely, home of the International Wolf Center. Yellowstone National park has been in the news recently due to the planned reintroduction of wolves to this ecosystem. Come and Learn more about this magnificent wild canine."

"This presentation is part of the continuing series of "Connections" programs. The Connections series is sponsored by the Linn County Environmental Council."

Cedar Valley Rocks and Minerals Society is a member of the Linn County Environmental Council.

PINT'S QUARRY

The following material is borrowed from the report of a Micromount meeting of the Earth Science Club of Northern Illinois (ESCONI), November 12, 1994. The main theme was Pint's Quarry. I have edited out portions which did not apply to Pint's.

"Tonight's program concerned the minerals of Pints Quarry, Iowa. Andy Hay opened the meeting with a discussion of the geology of the area. Pints Quarry was developed by Harold Pint. It is near the town of Raymond, IA. 30 meters of the Cedar Valley formation of Devonian Age is exposed at the quarry. The lowest member of this formation is called the Solon, and this has the best mineralization. This bed has unbranched, sinuous burrows running horizontally and does contain some fossils and fossil fragments. The most common are corals, but brachiopods, bryozoans are present

The layer above the Solon has horizontal and vertical burrows and is called the Rapid. It shows signs of wave action during deposition and signs of churning by burrowing animals.

Mineralization at the Solon layer at Pints Quarry resembles that of Upper Mississippi Valley Lead-Zinc deposits. However, most of the mineralization at Pints occurs in vugs, rather than crack fillings. Iron sulfide minerals in the Solon group have an enrichment in nickel, copper, cobalt, in contrast to other layers present at Pints. The association of carbonaceous matter with the metals above may be due to circulating hydrothermal fluids.

The vugs at Pints in the Solon group often show no clue as to their origin, but some appear to be derived from silicified fossil corals. Paragenesis of the Pint minerals is difficult as many of the minerals occur in more than one generation. Generations can be distinguished sometimes as in the case of pyrite, by crystal habit. Other minerals, like galena, sphalerite and gypsum are rare at the quarry and isolated, so paragenesis for these is hard to sort out.

Kathy Dedina discussed the minerals. The major minerals are fluorite, marcasite, pyrite, calcite, sphalerite and barite. It is not unusual to find four minerals in the same specimen with good crystals.

Calcite is the most abundant mineral at Pints. Often crystals of calcite are dotted with other minerals. Size of crystals can go up to 25 cm! The calcite is white to colorless, with some amber color, and pale pink. Crystals of calcite are found usually in the scalenohedron, with occasional modification by rhombohedra and prism faces. An unusual curved crystal form has been found and may have been formed by dissolution rather than deposition.

Pyrite is the next most common mineral. Octahedral is the dominant form, but cubic crystals are known. The largest crystals have been about 1 cm, but 3-4 mm size is more common.

Marcasite occurs as blades at the quarry. Needles and tabular forms are less common. The needle forms are mistaken for millerite. Fluorite is fluorescent creamy white to white-yellow, under LW (long wave) Uv light. The majority of fluorite has a honey-yellow color. By far, much of the fluorite crystallizes in the cubic system. 1 cm crystals are not rare.

Barite is frequently found, usually in association with calcite, fluorite or pyrite. Most of the barite is colorless or white, tabular crystals in radiating aggregates. Crystals up to 2 cm are not uncommon.

The remaining minerals: galena, sphalerite, gypsum are quite rare at Pints, in contrast to the others discussed. Sadly, Pints is now flooded with water and a nearby quarry has provided no mineral crystals at present. Many quarries have closed due to changes in road construction, the decline of railroads in the U. S. and the changes in the steelmaking industry.

Not much was found about why this material fluoresces, but it is probably due to organic activators, just as the material from Clay Center, Ohio.

TRAVEL: PREHISTORIC TRAILS

By The Associated Press

The oldest wild west creatures were dinosaurs and other ancient animals, and visitors to Wyoming, Montana, the Dakotas, and Nebraska can study their fossils at a number of sites.

The museum at Rock River, Wyoming, displays finds of paleontologist Robert Bakker from his work at the "Dinosaur Graveyard" at nearby Como Bluff in southeastern Wyoming.

The Geological Museum on the campus of the University of Wyoming in Laramie displays a Brontosaurus skeleton, and there's a full-size copper mold of tyrannosaurus rex outside the building.

Western Wyoming College in Rock Springs has several dinosaur casts from around the area, including a Tyrannosaurus rex.

The Fossil Butte National Monument near Kemmerer, Wyoming, contains a highly concentrated number of fossilized fish and plants. Fossil Butte's Wasatch Formation rises 7,500 feet above sea level with bright red, purple, yellow and gray colorings.

The Museum of the Rockies at Bozeman, Montana, is one of the country's best known dinosaur attractions with displays of dinosaur eggs, embryos and nests found near Choteau, Montana, an area now known as Egg Mountain. Egg Mountain is replicated at the museum with life-size reproductions of 32 dinosaurs. Skeletons and skulls of Tyrannosaurus rex, Triceratops, and others are on display.

The Carter County Museum in Ekalaka, Montana, has fossils; dinosaur bones and a complete skeleton of an Anatosaurus, or duck-billed dinosaur.

A recent Triceratops discovery is centerpiece of a new Visitors Center at Makoshika State Park near Glendive, Montana. The park has a number of interpretive trails and part of the Hell Creek Formation a 65-million-year-old rock layer that winds through the Badlands of Montana.

You can watch technicians at Dakota Dinosaur Museum in Dickinson, N.D., prepare a 2,000-pound Triceratops skull, found in North Dakota Bad Lands, for permanent display. This new museum, completed last summer, also has ten full-scale dinosaurs, including an Allosaurus.

The Museum of Geology in Rapid City, South Dakota, displays an extensive collection of Badlands fossils, including ancient camels, horses and a mother oreodon with skeletons of unborn twins encased in her bones.

About 100 Columbian mammoths have been left entombed en situ at the Mammoth Site in Hot Springs, South Dakota. It's believed the 10-ton creatures were entrapped in the watering hole over 26,000 years ago when they either slipped in or ventured in without being able to retreat up its steep banks.

Remains of exotic animals - three-toed horse, dog-sized camels, saber-toothed tigers, giant pigs, rhinoceros-like titanotheres - can be seen at Ashfall Fossil Beds State Historic Park between Royal and Orchard, Nebraska.

For more information, contact Old West Trail Country, in care of South Dakota Tourism at 711 East Wells Avenue, Pierre, South Dakota 57501-3369

Noticeably absent from the AP list, among others, is the Black Hills Institute of Geologic Research (Hill City, SD). This is another must see stop for anybody travelling through the "West". The collections include hadrosaurs, ammonites, minerals, mastodons, etc., etc., etc., and a couple T rex's in prep. Definitely worth your while to stop in.

Dean Grier, North Dakota S. U.

via THE ROCKFINDER 11/94

EXPLORE THE DEPTHS OF ANCIENT IOWA SEAS

(A portion of an article in the IOWA HISTORIAN, the bulletin of the State Historical Society of Iowa, given to me by Gladys Wanek.)

CONTINUED ON BACK PAGE

SAVE OUR FOSSILS & OUR FOSSIL COLLECTORS
Support the Paleontological Resources Preservation Act of 1995
FICTION and FACT

Falsehood: fossils are rare. **Fact:** Fossils, even vertebrate fossils, are abundant. Dr. Charles Love, geologist from Western Wyoming College says that "just one-half mile layer [of the Green River Formation]..contained 12 billion fish [vertebrate fossils]." "That's enough" he said "to give two [fossil fish] to every person on the planet." Or consider the 3,000 elephant (mammoth) skeletons per square mile estimated to lie under the State of Nebraska's soil by Dr Michael Voorhies of the University of Nebraska's Department of Vertebrate Paleontology as quoted in a recent Cairo, Nebraska newspaper.

Falsehood: public lands are "raped", "pillaged", "plundered" or "poached" of fossils by "greedy" amateur and commercial collectors. **Fact:** Nearly all fossils once exposed are destroyed by the same forces of weathering (wind, rain, ice & sun) that expose them in the first place. Literally billions of fossils are destroyed by these forces every year. Any possible damage to or loss of fossils and collecting sites by careless, negligent or greedy collectors is miniscule compared to that done by mother nature herself.

Falsehood: fossils can be protected for future generations by leaving them in the ground. **Fact:** fossils are only preserved for posterity if they are discovered and collected. Every possible eye and hand is needed to find and collect fossils if even a small percentage are to be saved for research and display.

Falsehood: If we limit the number of fossils collected then there will be more fossils available and museums will be able to afford them. **Fact:** The recent proliferation of private, Earth science supply houses is the direct result of the unmet demand for teaching, research and display specimens by high schools, universities and museums.

Falsehood: Only academic paleontologists in certain acceptable institutions can be trusted to "do" paleontology correctly. **Fact:** of the 18 skeletons of *Tyrannosaurus rex* collected to date, all but one were discovered by amateur or professional collectors. According to eminent paleontologist, Dr. Robert(Bob) Bakker, over 80% of all major, paleontological discoveries are made by amateurs. Add the major discoveries made by private, professional paleontologists and the percentage of major paleontological discoveries by academic scientists becomes very small.

Falsehood: Paleontological resources (fossils) must be regulated the same way we regulate archeological resources. **Fact:** Fossils (paleontological resources) are infinitely more abundant than the remains of human beings and their culture (archaeological resources) because archaeology is the study of the remains of only one species (humans) and paleontology encompasses the study of the remains of all the billions of other animal and plant species that ever lived on earth.

A National Academy of Science, three year study is the most comprehensive look at this issue and the conflicting views within the paleontological community, to date, and the only one that involved virtually every affected group in gathering its data and arriving at its conclusions. The NAS 1987 committee report concluded that: "we challenge the archeology-paleontology link and urge a different approach to the 'regulation' of fossil collecting.." "that would benefit the science", that "the role of the land manager should be to facilitate exploration for and the collection of, paleontological materials", and that "paleontology is best served by unimpeded access to fossil(s)" on public lands.

In 1992, Senator Baucus (MT) introduced legislation that would ban all fossil collecting on public lands except by degreed academics and amateurs under their immediate supervision (massive public protest killed the bill in committee).

As a direct result of the fears created by the introduction of the Baucus Bill, the American Lands Access Association (ALAA) was formed by the country's two largest amateur, fossil and mineral associations. In consultation with academic and private paleontologists, they authored *The Paleontological Resources Preservation Act*. This bill is faithful to the guidelines established by the NAS Committee on Paleontological Collecting. This legislation is now ready for simultaneous introduction in the House and Senate in the 104th Congress.

CONTACT YOUR MEMBERS OF CONGRESS IMMEDIATELY WITH YOUR REQUEST THAT THEY SPONSOR AND SUPPORT THIS LEGISLATION and urge friends, family and colleagues to do the same. For copies of the bill, background material on this issue, and names of Congressional sponsors contact Marion Zenker, ALAA Legislative Coordinator, c/o Black Hills Institute of Geological Research, Inc.; P.O. Box 643; Hill City, South Dakota 57745 Phone (605) 574-4289 Fax: (605) 574-2518

IS YOU IS, OR IS YOU AIN'T, A QUARTZ ROCK?

The Nomenclature of Quartz Types



Nomenclature is just a fancy word meaning a system of naming. In any scientific field of study an accurate system of naming is required.

There is confusion between common names and scientifically precise names. To some people any evergreen tree with needle-like leaves is a "pine" tree. In the midwest, a gopher means a small burrowing rodent. In the deep south, gopher refers to a burrowing tortoise.

For living things, scientific names are derived based on such features as physical structure, reproductive methods, size, and habitat. The scientific study of minerals uses characteristics like chemical composition, atomic crystalline structure, and specific gravity for exact description and distinction.

This article will take a simpler approach. It's only an attempt to clarify the jumble of names used and confused in referring to types of quartz materials. It will rely heavily on consensus from many experts.

To keep it simple: quartz is silicon dioxide - one atom of silicon plus two atoms of oxygen. Silicon and oxygen are the two most abundant chemical elements in the earth's crust. Their compound, usually mixed with other materials, makes up by weight about one-eighth of the earth we know. Quartz is found in some form in every continent.

Its widespread distribution arises from its varied methods of formation. Some is formed when molten rock, magma, cools. Some fills veins in cracks or holes in base rock. Strange as it seems, quartz is in some conditions soluble in water, and the solution, silica, leads to secondary deposition in vacancies in basalt, shale, limestone, sandstone, etc.

Large Crystal Quartz

Quartz analysis starts with a division of types according to crystal size. The forms with large crystals will be considered first. They are formed by relatively rapid cooling and are often mostly transparent even when colored by tiny amounts of mineral impurities. Absolutely clear quartz is colorless, often called rock crystal, rather rare although it has been found in large masses in Europe, Brazil, and the U.S. It has been prized since prehistoric times, and was a favored carving material of the Romans. Herkimer "diamonds" and Pecos "diamonds" are examples of clear quartz found in our country.

Well-known colored transparent quartzes are amethyst, citrine, and smoky. In amethyst the shades of lavender and purple, and the yellow of citrine are colored by iron compounds. True citrine is rare. Most commercial "citrine" is heat-treated amethyst. Smoky quartz's color, light brown to gray to black, is due to aluminum or silicon inclusions. Cairngorm and morion are names given to smoky quartz types. Heated amethyst can produce colors resembling precious topaz. Such names as "citrine topaz" and "Madiera topaz" are used, but the material is quartz, not the more valuable topaz.

Some colorless quartz contains visible straw-like fibers of golden rutile or black tourmaline, producing striking patterns.

Other large crystal types are: milky quartz, opaque to translucent white, owing its color to great quantities of very tiny trapped bubbles of air or water; and rose quartz, usually cloudy pink, colored by tiny specks of titanium or iron compounds.

Cryptocrystalline Quartz

The other main division of quartz types is those with exceedingly tiny microscopic crystals. The term cryptocrystalline is used; *crypto* from a Greek root meaning "hidden," as in cryptography.

The basic type of cryptocrystalline quartz is chalcedony. In pure form it is somewhat porous, translucent, and has a waxy pale gray or white appearance.

When colored by traces of impurities it is called by many names. Often names come from the finders, or the location of the chief occurrence. If it is translucent with parallel layers, or the impurities form patterns, it is usually called agate. The name comes from the Greek name *Akhates* for a river in Sicily where they were found in great numbers.

Some local names are given to agates. Examples of banded agates are Lake Superior, Fairburn, and Teepee Canyon from the U.S., and the vast quantities from Uruguay and Brazil. True onyx is banded gray or black and white agate. This is not to be confused with the non-quartz "onyx" from Mexico or Pakistan, caved into large pieces such as book-ends or ash trays. It is a type of marble.

If the impurities form spots or patterns resembling plant material in a clear chalcedony background they may be called plume or moss agates. Famous varieties of this type occur in Texas, Oregon and Montana. Black inclusions are often manganese dioxide, red are oxides of iron.

Because it can be dyed, much commercially offered agate has colors seldom appearing in nature - dark blue, orange and bright yellow.

Chalcedony of a uniform translucent color may be green as in chrysoprase, reddish orange as in carnelian, amber to brown as in sard. Aventurine is clear chalcedony with tiny specks of green mica.

*The distinction between
jasper, flint and chert
is not clear-cut.*

When cryptocrystalline quartz has enough inclusions to be opaque it is usually called jasper, flint or chert. Now the nomenclature gets murky. Nature does not operate like a factory, so many rocks are blends or mixtures of

Quartz

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jasper, flint, or non-quartz materials. Pure prototypes of a named type are often difficult to find. There is a multitude of jasper types - often with mixtures of colors - mainly red, yellow, green or brown. Bloodstone is a dark green jasper with bright red spots. Certain distinctive deposits will be given their own names. Examples of distinctive jaspers in the U.S. are Bruneau, Morrison Ranch, Willow Creek, Poppy, Owyhee, Biggs, and Wild Horse Canyon.

The distinction between jasper, flint and chert (also called hornstone) is not clear-cut. All are opaque, heavy with impure inclusions. As a generality, flint is considered less "pure" than jasper, but more "pure" than chert. Actually, a given specimen, e.g., an aboriginal point examined by a dozen experts would probably have one or more call it jasper, flint, chert, or even agate. The precise application of names is not possible. Flint, while often dark brown or black, may be multi-colored as in the spectacular Flint Ridge material from Ohio.

Chert may be almost any color although the name is most often applied to dark yellow-brown types.

Other specialized forms of quartz are opals, and those arising from the replacement of mineral or organic materials.

Opal may occur in layers in sedimentary rock, or in gas cavities in volcanic rock. It does not have a crystalline structure. Its play of colors is due to light being refracted by the closely packed tiny silica spheres, in the presence of water.

Replacement of fibrous asbestos by silica results in parallel bands of quartz which, when properly oriented, cause a sheen of chatoyant light. The resulting "cat's eye," "hawk's eye," or "tigereye," depends upon the background color being green, blue, or yellow on brown, respectively.

Under the right conditions both plant or animal materials may be replaced, cell by cell, by silica. Petrified wood has been found in nearly all of the continental states. The amazing colors of "agatized wood" from Arizona is well-known. Other less colorful types are abundant in the western U.S.

In other situations, organic replacement of animal material such as fossilized bones of dinosaurs, turtles or other reptiles may occur.

An example of mineral replacement is the fossilized coral skeletons from Tampa Bay.

In summary:

Call it amethyst, flint, or agate,
Doesn't matter much how you tag it,
What you're holding is still just a piece
Of quartz - IT'S QUARTZ!

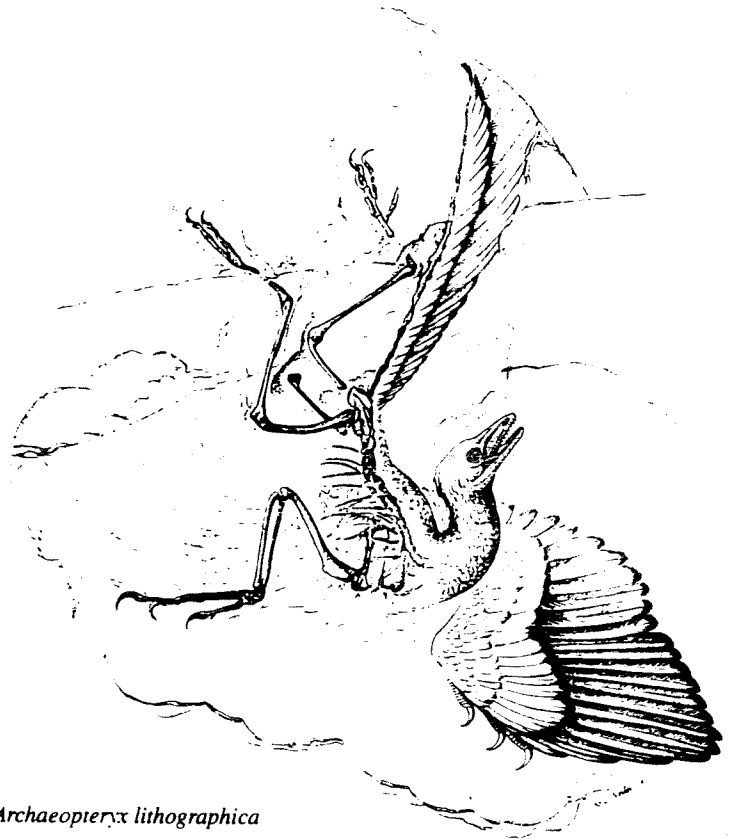
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- by Art Reed, member of Des Plaines Valley Geological Soc., in their bulletin (Nov. 1994), Crystal Cluster, of which he is editor.

FOSSIL COLLECTING

WHAT IS A FOSSIL?



Archaeopteryx lithographica

ANCIENT LIFE

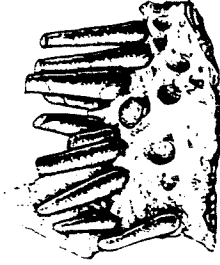
A fossil is any evidence of ancient life. This evidence may be the actual remains, such as bone, teeth, shells or plant tissues; chemically altered remains; or traces of the activities of extinct organisms, such as burrows and trackways. Paleontology is the study of fossils. Scientists who study fossils are paleontologists. Paleontologists use fossils to reconstruct ancient life. Paleontology is often confused with archaeology which is the study of ancient humans and their cultures. The focus of paleontology is the history of life on earth, from its beginnings approximately 3.6 billion years ago, up to the advent of human culture about 10,000 years ago. The study of fossils draws upon the sciences of geology and biology to place organisms in time, space and in relation to other forms of life. Except for rare occurrences, fossils are found only in sedimentary rocks.

TRACE FOSSILS

Trace fossils are evidence of the activities of ancient organisms. Trackways of dinosaurs and trilobites, or the burrows of worms, clams and other organisms are often the only fossil evidence preserved. Trace fossils yield information about how organisms lived. Rarely is an organism preserved at the end of its trail. In the case of most trace fossils, we are able to identify the perpetrator only in general terms. Coprolites (fossil excrement) can reveal what animals ate. Groups of nests and multiple, parallel trackways indicate herding behavior for some dinosaur species. Trace fossils can help us determine feeding habits, body size, locomotion, social behavior and other aspects of day to day existence. They are glimpses of the activities of extinct organisms.



Bird Trackway



Pelecypod Borings



Crocodile Coprolite

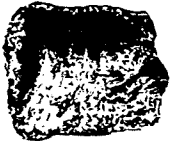
EVOLUTION

The fossil record reveals the appearance and disappearance of species that seem to have arisen suddenly, then remained unchanged for millions of years only to abruptly disappear. During the years since Darwin, there have been many changes in the way we view this record. The Cambrian fossil record documents the swift appearance, geologically speaking, of virtually every modern animal phylum as well as many now extinct. Apparently, there was a dramatic and early diversification of life. The fossil record shows the extinction of at least 25% of the phyla that existed in the Cambrian. We see, thereafter, a rise in diversity within animal phyla but no new phyla developing. Geologic time is punctuated by the disappearances or mass extinctions of vast numbers of organisms, possibly provoked by environmental catastrophes, followed by new diversification within existing phyla. The fossil record shows extinction as a major contributor to evolution. Perhaps, only when populations are under stress and when ecological niches open, do new organisms appear, filling gaps left by the demise of former species. It is possible that surviving major environmental change allows some organisms to diversify because others have perished.

via BELL NOTES 10/93



Interment (Fish)



Desiccation (Sloth Dung)



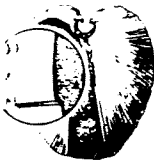
Refrigeration (Mammoth)



Replacement (Wood)



Permineralization (Dinosaur Bone)



Recrystallization (Pelecypod)



Pseudomorphosis (Wood)



Dissolution (Wood)



Distillation (Fern)

FOSSILIZATION PROCESSES

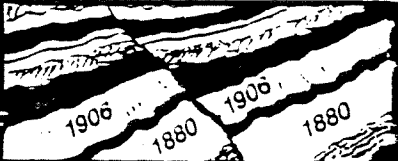
Various processes may produce fossilization. The longer a fossil lies buried in the earth, the more changes it may undergo. Therefore, many fossils are preserved by a combination of two or more of the following processes. **Refrigeration:** Animals and plants may be preserved frozen in permafrost. **Desiccation:** Animals that die in dry caves may dehydrate and be preserved for thousands of years. **Interment:** Most fossils are preserved as a result of being covered by sand, mud or volcanic ash. **Recrystallization:** Some mollusk and echinoderm exoskeletons undergo a crystal structure modification. **Permineralization:** Wood and bone are often preserved with the original cellular spaces filled with minerals. **Replacement:** After cellular spaces have been filled, cell walls often dissolve and are replaced with minerals leaving visible structure but little or no organic material. **Distillation:** Fragile organisms may be preserved as carbon films when volatile chemicals dissipate leaving residual, organic material. **Dissolution:** When buried remains are completely dissolved, a void may be left in the rock which is a mold of the original organism. **Pseudomorphosis:** If a mold fills with minerals, the result is a cast of the organism with no internal structure or organic material preserved.

NATURAL LAYERS

Once Upon A Time,

parts of the Earth were covered by oceans. When the weather got colder, glaciers grew at the poles. This action lowered the water level, creating places where rain, snow, and mountain runoff water could fill the spaces forming lakes, rivers, and streams. While heat and ice changed the land, waves pushed and rivers carved new landforms.

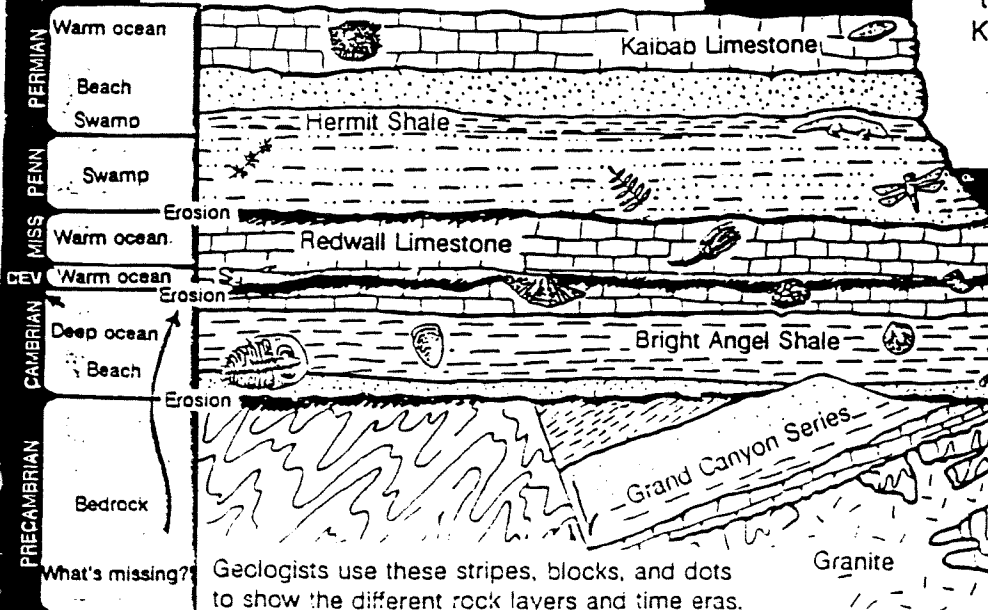
You can see shifted layers at faults



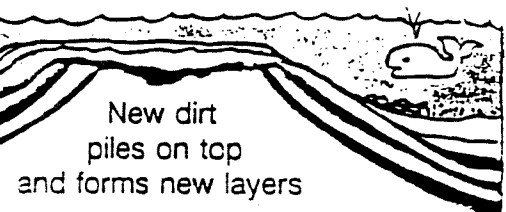
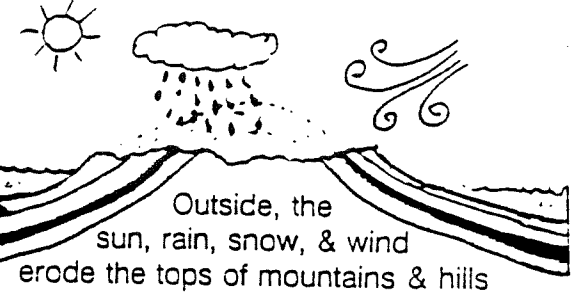
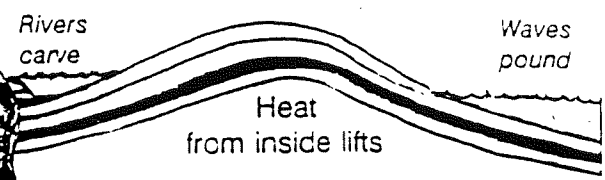
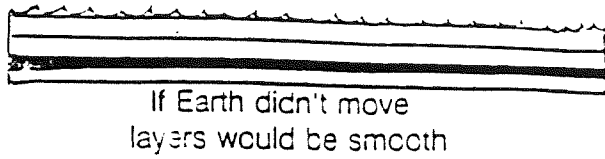
At the Grand Canyon, the mighty Colorado River carved deep grooves in the Earth's crust, leaving us a picture of many layers (STRATA) below. It took the river 30 million years to cut 1800 m (1 mi.!) down for us to see clues of time and climate changes!



THE GRAND CANYON



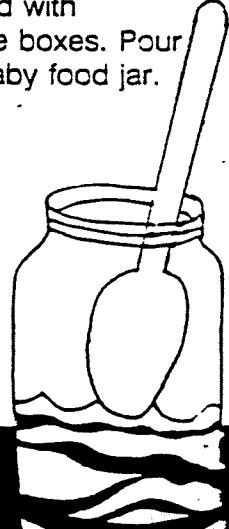
Geologists use these stripes, blocks, and dots to show the different rock layers and time eras.



Activity

To make a **LAYERED SAND JAR**, mix sand with powdered tempera paint in shoe boxes. Pour different colored layers into a baby food jar.

Add some layers on an angle or gently press a spoon around the edges to create scallops. Keep putting a new color on top and see how layers form on Earth.



By comparing the colors, the fossils, & the thicknesses of the layers in other parts of the world, we solve the mystery of Earth's history.

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IOWA SEAS (CONTINUED FROM PAGE 6)

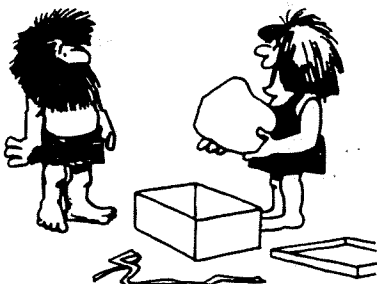
"A selection of some 350 ancient fossils, many of them crinoids rescued from limestone quarries near LeGrand, Iowa, are featured in the Society's new exhibit, "Flowers of the Iowa Seas," which opens February 18 at the State Historical Building in Des Moines.

"Flowers of the Iowa Seas" offers more than a collection of fascinating fossils, it also tells the story of several Iowans who devoted much of their lives to finding and preserving local crinoids. Along the way, you'll also receive an intriguing lesson in geology to help you better understand how the fossils - as well as Iowa's topography - were created."

One of the highlights of the exhibit is a 150-gallon marine reef aquarium that will include modern day relatives of animals that thrived in Iowa's ancient seas. You'll see living crinoids, coral, snails, clams, sea worms, and chambered nautilus."

"After learning about the contribution of crinoids, visitors are given an opportunity to sign a petition to make crinoids the state's official fossil". via ACHATES

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"How sweet... My birthstone!"

Historian