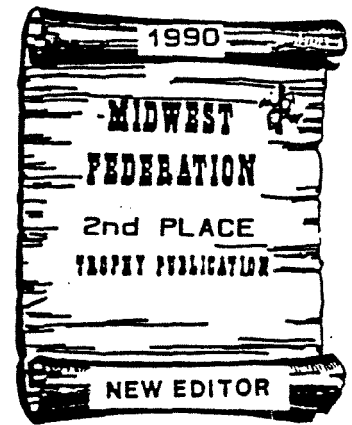




PICK & SHOVEL



INSIDE... QUARTZ TRIVIA
GEM DIG TIPS

Volume 31,
May,

No. 9
1991

Lincoln Gem and Mineral Club, Inc.

P. O. Box 5342

Lincoln, Nebraska 68505

1991 ELECTED OFFICERS

President: Fred B. Holbert , 2822 S. 13th St., Lincoln, NE 68502	423-5639
1st Vice President: C. David Heffelbower , 1819 Washington St., Lincoln, NE 68502	475-4713
2nd Vice President: Charles Wooldridge , 836 S. 31st St., Lincoln, NE 68510	475-9034
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Treasurer: Phyllis Parks , 2435 So. 19th St., Lincoln, NE 68502	476-6798
Board Member: Francis Belohlavy , 1919 "K" St., No. 4, Lincoln, NE 68510	477-4337
Board Member: Roger Pabian , 315 "D" St., Lincoln, NE 68502	474-2034
Board Member: Billie Heffelbower , 1819 Washington, Lincoln, NE 68502	475-4713
Board Member: Shirley Rockel , 1134 West Avon Lane, Lincoln, NE 68505	464-3059

NOMINATIONS COMMITTEE

3 Years: Kevin Schwartman, Chair.
Gerald Moore
Don Phillips
2 Years: James Null, Michael Smith
1 Year: Ed Ridge, Roger Pabian

LONG RANGE PLANNING AND BY-LAWS COMMITTEE

3 Years: Kevin Schwartman
Jim Marburger
2 Years: Bob Wright
Linda Parks-Lundgren
1 Year: Phyllis Parks
Charles Wooldridge

STANDING COMMITTEES

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Education: Roger Pabian
Field Trips: Francis Belohlavy
Historian: John & Lillie Lewis
Hospitality: Eddie "Lightning" Ridge
Study Group Coordinator:
Housing/Property: Jim Parks
Junior Activities: Janet Wright
Librarian: Jim Parks/Charles Wooldridge
"Gem Palette" Correspondent: Sandra McNiff
"Geology Day" Coordinator: Charles
Wooldridge

Programs: Charles Wooldridge
MWF Liaison: Vera Lyman
Scholarship: Dwight Miller
Christmas Party: Billie
Heffelbower
1990 Rockhound/Year:
Charles Wooldridge
1991 Show: John Harrison
1992 Show: Phyllis Parks
1991 Swap: David Heffelbower
1992 Swap: Roger Pabian

AUDITING COMMITTEE, 1987-1988

David Heffelbower
Francis Belohlavy
Shirley Rockel

YOUR PICK & SHOVEL STAFF

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Business Reporter: Vera Lyman
Financial Reporter: Phyllis Parks
Circulation : C. David and Wilma Heffelbower

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CALENDAR OF EVENTS

- MAY MEETING:** Saturday, May 18, 1991, 7:00 P.M.
Bethany Park Shelter House, Enter on Vine Street, between Cotner Blvd. and 66th Street. Note change in meeting time.
- PROGRAM:** Find your very own fame and fortune. A rare treasure in gems awaits you as you get your chance to find garnets, sapphires, agates, and a host of other treasures in left over aggregate from the show. Bring magnifiers, lights, small bottles to carry away your treasures.
- JUNIOR MEETING:** Junior program will be combined with regular program above so everyone will get a chance to find his or her own gems.
- COMING EVENTS:** SWAP: Northeast Nebraska Rock & Mineral. July 27, 28, Stanton County Fairgrounds, Stanton, NME
- SWAP: Fort Kearney Rock Club, Sept. 7, 8, Cotton Mill Lake, Kearney.
- SHOW: Fort Kearney Rock Club, Nov. 2, 3, Hilltop, Mall, Kearney.

REGIONAL SHOWS:

1991

San Jose, CA June 14-15-16	Tampa, FL Sept. 19-22	South Bend, IN Aug.30-Sept.1	Seattle, WA July 26-28	Salt Lake, UT June 14-16	Lubbock, TX June 7-9
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FUTURE MEETING DATES, PLACES: June 22, 1991, PICNIC, time and place to be set a May meeting.

DISPLAY MATERIALS: Bring items that relate to May (Emerald), June (pearl, moonstone, alexandrite), or July (ruby), or recent examples of your lapidary work. Cases will be furnished.

PRESIDENT'S MESSAGE

CATCHING UP ON THE "OLDS" (WHEN THE INFORMATION ISN'T NEW)

HOPE SPRINGS ETERNAL:

We see from our old newspaper clippings that the Hope Diamond was removed from its exhibit location at the Smithsonian Institution and worn by Georgette Mosbacher in celebration of a \$1 million gift from the Harry Winston Research Foundation. The funds are to be used to renovate the Geology, Gems and Minerals Hall at the National Museum of Natural History of the Smithsonian Institution, where the stone is kept. Harry Winston was the famous gem merchant who purchased it for \$179,920 and gave it to the museum in 1947 (in 1908 it had once been purchased for \$400,000 by the Sultan of Turkey).

The 45.5-carat midnight-blue gem is valued at more than \$100 million and is said to carry a curse of tragedy for any who would own or wear it. Mrs. Mosbacher felt cursed - she had to give it back!

CREED OF GREED:

Did you read of the two brothers who found a 80-pound chunk of morganite in a quarry that they lease in Maine. It was a transparent single crystal of rose-colored beryl that measured about 13" across and weighed 115,000 carats with a reported value of about \$1 million. Because the brothers could not agree on how to sell the specimen, the "Rose of Maine" was chopped into pieces last November with each brother getting several chunks as well as the owner of the quarry. James Mann, a local stone cutter, said that they would be lucky to receive a total of \$60,000 now that it had been chopped up. Easy come, easy go!

MORE FROM THE ARCHIVES- STOP & SMELL THE ROSES:

Just a thought from last fall: when planning a trip to a gem show this coming year, why not plan to see some of the town in which the show resides?

While wrapping up our vacation trip to Arkansas last October, my wife and I stopped at Topeka, Kansas, for their annual gem show. In addition to the show, which I always enjoy, we toured the town. One of our first stops was the Kansas State Capital building. They have quite a rock show there; the building consists of vast quantities of 17 different varieties stone shipped from around the world. It is a beautiful work of architecture and an exciting tour.

From the capital, we traveled to the Reinisch Memorial Rose and Rock Garden located in Gage Park. This is 3 acres of gorgeous sights and smells surrounded by a large scale miniature train which you can ride in for a trip around the park. On the way to and from the park, we oo-ed and ah-ed at many marvelous restored Victorian homes. We'll be back to see the rest.

FRED B. HOLBERT

NEW PUBLICATIONS

The following publications are now available from Conservation and Survey Division, IANR, University of Nebraska, Lincoln, NE 68588-0517. Please add \$1.00 for postage and handling above cost of publication.

Nebraska Mineral Operations Review, 1990, R.R. Burchett and D.A. Eversoll, April, 1991, \$1.00 + postage and handling.

Groundwater Levels in Nebraska, 1989, M.J. Ellis, G.V. Steele, and P.B. Wigley, \$6.50 + postage and handling.

Late Paleozoic Cyclic Sedimentation in Southeastern Nebraska: A Field Guide, R.K. Pabian and R.F. Diffendal, Jr., \$5.50 + postage and handling.

New Publication Catalogue, April, 1991. Free upon request. +++

NEBRASKA ACADEMY OF SCIENCES

The Nebraska Academy of Sciences held its 101st Annual Meeting at Olin Hall on the Nebraska Wesleyan University Campus, Lincoln, on Friday and Saturday, April 26 and 27, 1991. Nineteen papers were given in the Earth Science Section which I chaired. Of particular interest to rockhounds is a paper I presented with Andrejs Zarins on origins of certain structures and inclusions in agates. It is abstracted below.

CHAOS AND FRACTALS AS EXPLANATIONS FOR THE ORIGINS OF CERTAIN STRUCTURES AND INCLUSIONS IN AGATES

Roger K. Pabian, Conservation and Survey Division, IANR, University of Nebraska, Lincoln, NE 68588-0517 and Andrejs Zarins, 1745 "D" Street, Lincoln, NE 68502

Concentrically arranged bands characterize most agates that formed as vesicle fillings in both rhyolitic and basaltic rocks. Many previous workers have considered the bands to have formed one at a time as silica saturated waters passed through gas vesicles in the host rock. We suggest that bands form almost simultaneously when incompatible sulfo-salts react with silica gels already filling the vesicle. This propagates an electrochemical wavefront in an orthosilicic acid medium resulting in spherulitic crystallization of the silica to form bands and expulsion of the sulfo-salt to form crystalline inclusions in the agate. Hence, the bands may be the result of a self-organizing structure characterized by circularly expanding wavefronts, bounded by the vesicle wall, similar to those seen in Belousov-Zhabotinskii reactions.

Manganese oxide inclusions in some agates have been called dendrites that resemble bushes or trees and sunbursts that resemble the solar corona during a total eclipse. These had been considered to be variations on a similar theme; however, fractal imaging with computers suggests each formed by a different method. Dendritic patterns in agates most closely resemble diffusion limited aggregations in which particles move in irregular paths in a random walk. Sunbursts most closely resemble ballistic aggregations in which particles move in straight but randomly oriented linear paths.

Attention, exchange editors! Above paper should be referenced as: Reprinted from Proceedings, The Nebraska Academy of Sciences, 101st Annual Meeting, Nebraska Wesleyan University, Lincoln, Nebraska, April 26, 1991, p. 61.

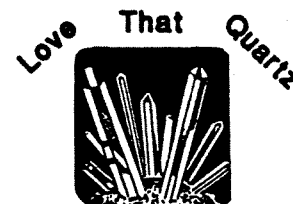
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OTHERS WRITE

Reprinted from The Rockpile, MMLSD, Dearborn, MI, April, 1991.

A MMLSD Original Article

QUARTZ (not pints) TRIVIA



(ED. NOTE: This is the last of four articles on quartz by MMLSD member Joyce Hanschu. "Love That Quartz" is the theme slogan for the MMLSD gem and mineral show to be held May 17-19 at the Dearborn Civic Center.)

Quartz, the mineral known through the ages in nearly every part of the world, not surprisingly, has produced a wealth of historical trivia. The following items are some of the more interesting gleaned from the quartz literature:

Flint, chert and jasper were used as weapons and tools by many stone age people, as early as 100,000 years ago. These minerals are widely distributed and so were readily available. Examples of these weapons and tools are projectile points (arrowheads and spear points), axes, celts (hammers), scrapers and knives.

The Sumerians were among the earliest cutters and polishers of quartz gems for beads, seals and rings. Carnelian and agate were the most popular. The Sumerians also used agate for ceremonial axe-heads.

Cut, polished and engraved agate have been dated to the Mycenaean age of Greek culture.

Quartz crystal lenses dating from 3800 B.C. have been found in the ruins of Nineveh, and quartz lenses dating from 1600-1200 B.C. have been found at Crete.

The Egyptians collected agate from the desert near Gebel Abn Dizeiba and Aswan around 3500 B.C. They also mined quartz crystals and amethyst near Aswan about the same time.

Agate was traded among the Arabians around 500 B.C.

Mining and cutting of agates began in India about 500 B.C. and is still going on today.

In various parts of the world, archeologists have found goblets, cups, bowls, intaglios, bottles and fig-

ures carved from agate, amethyst and carnelian.

Theophrastus (c. 372-287 B.C.), in his treatise on "Stones" was the first to write about agate, noting that it is a beautiful stone which sold at a high price. He also states that the name agate was derived from the river Achates in Sicily, where agates were found in quantity.

Mohammed wore a signet of Yemen agate.

Pliny the Elder (23-79 A.D.) in his "Natural History" cites Sicily, Crete, India, Phrygia (an ancient country in west central Asia Minor), Egypt, Cyprus, Rhodes and Persia (Iran) as some sources of agate. Pliny also wrote about agates that "present the appearance of rivers, woods, beasts of burden and forms even like ivy and the trappings of horses."

One of the most striking objects ever worked from agate is a two-handled wine cup, with a capacity of over a pint, carved on the outside with bacchanalian subjects. History says it was made for the Emperor Nero, and after passing through many hands, it wound up in the 9th century in the Abbey of St. Denis, where it was used for centuries to hold wine at the coronation of the Kings of France.

The "Fishermen's Ring" (the ring of authority of the Pope) and the rings given to Cardinals at their investiture are set with amethysts.

A large amethyst is the centerpiece of "St. Edward's Crown," dating to 1042 when it was worn by Edward the Confessor, making it the oldest of the English crown jewels.

Frederick the Great had two tables of chrysoptase, 3' by 2', in his Old Palace at Potsdam.

A 6" x 5" engraved cameo of gem chrysoptase, dating from the second century and believed to be the world's largest gem chrysoptase, is in the Maxwell-Summerville Collection of engraved gems at the University of Pennsylvania.



LINCOLN GEM & MINERAL CLUB, INC. - BOARD OF DIRECTORS - April 1, 1991
NE Hall Rm 115 7:30 P.M.

Scholarships: Chairman, Dwight Miller

Board discussed selection of scholarships. The scholarships this year would be presented in memory of Jim Taylor and Francis Tracy.

Motion by Vera Lyman that Phyllis Parks send check for \$ 100. (to include the two \$ 25. show stipends) (\$ 50. short from last year's deposit of only \$ 300. to UNL Foundation). This would make the scholarship for each this year \$ 200. 2nd to motion by Charles Wooldridge. Motion carried.

President called the regular meeting to order. Minutes and treasurer's reports were read and approved.

(Liability Insurance breakdowns = \$ 50. for 3-day Show; \$ 150. for general Club)

BILLS: Club bills presented and paid with motion for approval by Dave Heffelbower, 2nd by Francis Bellohlavy. Motion carried.

Show bills presented and paid with motion by Roger Pabian, 2nd by Charles Wooldridge. Motion carried.

May Board Meeting on May 6' General Meeting on May 18 at Bethany Park. Items for May Pick & Shovel must be ready at April 27 General Meeting.

Discussions:

"Advertising" at Club functions and shows, etc. More thought till next meeting.

NAOESCI Insurance & lack of information.

SHOW:

Re: finances Show chairman must have budget by Oct. Board Meeting. Any items anticipated - line item budget.

Complete list of dealer/demo fees; gate fees. Show chairman attend Board Meetings, if unable, appoint a Show committee member.

Show profits - Put \$ 3000. into CD at best short-term rate.

Meeting adjourned.

Respectfully submitted,

Vera Lyman
Vera Lyman, Secretary

LINCOLN GEM & MINERAL CLUB, INC. _ GENERAL MEETING - April 27, 1991
Nebraska Center Norfolk Rm 7:30 P.M.

Vice Pres. Dave Heffelbower called the meeting to order in absence of Pres. Holbert.

Minutes and treasurer's reports were read with unanimous approval.

HOSPITALITY: reported 22 adult members and 6 guests present.

NO OLD BUSINESS:

NEW BUSINESS:

Roger Pabian donated a copy of the brochure "Richardson-Pawnee County Field Trip Guide" to the Club Library. A very helpful guide to rock hunters.

ANNOUNCEMENTS:

Board Meeting - May 6 at 7:30 P.M.

General Meeting - May 18 at 7:00 P.M. (please note change in time) at
Bethany Park Shelter House. *BRING DESSERT!*

It was reported that Lynn Wells is in poor health.

Tom Simmons is in VA Hospital

SCHOLARSHIPS:

Vice Pres. offered special thanks to UNL Geology Dept for participation in Show.

Also thanked UNL students and staff in attendance at meeting.

Dwight Miller, Scholarship chairman introduced Prof. Durrance and presented the checks to Scholarship recipients. Then Prof. Durrance introduced Theresa Dunn and Hannan LaGarry, recipients.

Each recipient gave a short but very interesting summary of their respective fields of study.

A short 20-minute social time followed with coffee and cookies.

Then *ROGER PABIAN* presented an interesting program.

Respectfully submitted,

Vera Lyman

Vera Lyman, Secretary

DON'T FORGET:

MEETING DATE: MAY 18, 1991

MEETING PLACE: BETHANY PARK SHELTER

MEETING TIME: 7:00 P.M.

**BRING: YOUR FAVORITE DESSERT FOR
OUR ANNUAL DESSERT SWAP**

**LIGHTS, TWIGGLES, SMALL CONTAINERS
TO CARRY HOME YOUR TREASURES.**

March 1990

GENERAL INTEREST PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY

The U.S. Geological Survey (USGS) publishes a series of nontechnical publications about geology, hydrology, topographic mapping, and related earth sciences. Single copies of these publications may be obtained free by writing:

USGS Book and Report Sales
P.O. Box 25425
Denver, CO 80225

The Big Five--Some Facts and Figures on our Nation's Largest Rivers (24p.)

Presents statistics for maximum, minimum, and mean flows for the Nation's largest rivers--the Mississippi, St. Lawrence, Columbia, Ohio, and the Missouri.

A Brief History of the U.S. Geological Survey (52p.)

Describes the bureau's growth, activities, and achievements from its founding in 1879 to its centennial in 1979.

Collecting Rocks (12p.)

Describes the origin of major rock types and how rocks can provide clues to the Earth's history. Includes suggestions for starting a rock collection, identifying specimens, and housing such a collection.

Earthquakes (24p.)

Explains the nature and causes of earthquakes. Describes the techniques used to detect, record, measure, and predict seismic disturbances. Provides historical data on several world-famous earthquakes that have occurred since 1755.

The Exclusive Economic Zone: An Exciting New Frontier (20p.)

Describes the geologic processes that form the ocean floors. Discusses the importance of the mineral potential of the Exclusive Economic Zone, which provides the Nation with nearly 3 billion acres of new frontier for study and exploration.

Geologic Maps: Portraits of the Earth (20p.)

Explains the nature of geologic maps, how they are made, and the ways they may be used to determine relationships of rocks on and beneath the Earth's surface. Shows examples of maps.

Geologic Time (24p.)

Explains relative and radiometric time scales and how geologists measure the age of the Earth. Illustrates the scientific processes that are used to interpret the Earth's geologic history.

Gold (24p.)

Discusses the nature of gold, its origins, and the geologic environments in which it is commonly found. Provides information about the uses of gold and a brief historical account of production in the United States.

Glaciers: A Water Resource (24p.)

Discusses the relationship between glacial ice and the amount of water on land surfaces. Describes the types of glaciers, their origins, and the natural processes that regulate the melting of ice.

Ground Water (24p.)

Describes the occurrence and movement of ground water beneath the Earth's surface as the largest single source of fresh water available.

Ground Water: An Undervalued Resource (12p.)

Describes the need for using ground water, the role of ground water in the economy, and an analysis of regional aquifer systems. Discusses the ways in which ground water and surface water interact.

Ground Water and the Rural Homeowner (40p.)

Presents a short description of ground water, some of the problems associated with ground water, and some suggestions for help with problems.

Ground Water Contamination--No "Quick Fix" in Sight (12p.)

Explains how ground water is contaminated by septic tanks or cesspools, municipal lagoons, sewers, landfills, or tailings piles, and the need for further research in contamination prevention.

How Much Water in a 12-ounce Can? A Perspective on Water-Use Information (20p.)

Provides information on how water was a free resource but now is considered an expensive commodity. Demonstrates how the ever-increasing use of water by industry and in the home is depleting existing supplies.

The Hydrologic Cycle (8p.)

Explains the natural process by which water is circulated from the seas to the atmosphere, to the land, and back to the seas in a continuous cycle.

Images of the U.S. Geological Survey, 1879-1979 (64p.)

Traces the history of the USGS through photographs. A brief explanatory text describes the history of the USGS, with captions that explain the images.

The Interior of the Earth (10p.)

Explains the structure and nature of the Earth's crust, mantle, and core. Describes the procedures used to obtain this information through studies of seismic wave patterns.

John Wesley Powell's Exploration of the Colorado River (32p.)

Describes Powell's daring voyage in 1869 through the canyons of the Colorado River, starting at Green River Station, Wyoming, and ending at the junction of the Colorado and Virgin Rivers in Arizona.

Land Use and Land Cover and Associated Maps (10p.)

Describes land use and land cover maps as aids to land-use planners, land managers, and resource management planners. Relates associated maps to land use and land cover maps and to other available data.

Landforms of the United States (20p.)

Discusses the sculpturing of landforms and the effects of wind, water, and chemical processes. Lists major physiographic divisions of the United States and describes their characteristic features.

Mountains and Plains: Denver's Geologic Setting (24p.)

Describes the nature and structure of the rocks that underlie Denver, Colorado, and part of the adjacent Front Range. Provides a road log to explain the natural features of the area.

Suggestions for Prospecting (28p.)

Compares modern prospecting techniques with those of earlier years. Gives suggestions for "panning" and instrument-based prospecting and provides information on mineral claims, Federal Government services, and reference material.

Tree Rings: Timekeepers of the Past (16p.)

Explains how past environmental conditions have been recorded in tree rings and how scientists interpret this information.

The U.S. Geological Survey Library System Serves Our Nation (8p.)

Describes the Survey's collection, comprising one of the world's largest earth science libraries. Lists services offered to the scientific community and to the public.

The U.S. Geological Survey's Photographic Library (8p.)

Lists services available from the USGS photographic library in Denver, Colorado. Explains how to obtain prints, slides, negatives, and other photographic material.

Volcanic Hazards at Mount Shasta, California (24p.)

Describes the kinds of volcanic activity that have occurred in the past, shows areas that could be affected in the future, and suggests ways of reducing the risks.

Volcanoes (48p.)

Describes the principal types of volcanoes, different types of eruptions, associated volcanic phenomena, their geologic settings, and how volcanoes are monitored. Explains how volcanic activity endangers and helps mankind.

Water Dowsing (16p.)

Provides a brief history of water dowsing. Explains how hydrologists of the USGS and other agencies use scientific methods to locate ground water.

Water in the Urban Environment: Erosion and Sediment (12p.)

Explores the dual role that water plays as both a resource and a hazard. Discusses possible actions that minimize erosion and sedimentation.

The Water of the World (20p.)

Discusses the amount of water contained in the world's atmosphere, on the surface, and underground. Describes the world's water balance.

Water Use in the United States, 1980 (10p.)

Summarizes the use of the Nation's water supply for domestic, industrial, rural, and irrigation purposes.

WATSTORE: A National Water Data Storage and Retrieval System (16p.)

Describes WATSTORE (Water Data STORage and REtrieval), a computer-based system that stores hydrologic data collected by the Survey in its investigations of the Nation's surface and ground water.

What Is Water? (8p.)

Describes the basic chemical properties of water and its diverse physical characteristics. Briefly explains the formation of water on Earth. Also available in Spanish.

Why Is the Ocean Salty? (16p.)

Discusses the origin of the oceans and the sources of their salinity. Also available in Spanish.

The Naming (and Misnaming) of America (12p.)

Describes how some localities came to be named, the derivation of these geographic names, and why the U.S. Board on Geographic Names was established.

NASQAN: Measuring the Quality of America's Streams (8p.)

Describes National Stream Quality Accounting Network (NASQAN) of the USGS, which provides data necessary to account for the quantity and quality of water moving within, and from, the United States.

Natural Steam for Power (12p.)

Describes the investigation of geothermal steam as a potential source of energy for power needs worldwide. Discusses the nature and behavior of steam formed underground.

NAMDEX: A Key to Finding Water Data (16p.)

Describes the National Water Data Exchange (NAMDEX), a national confederation of organizations active in water-resource fields. Explains how NAMDEX makes water data readily available to users for planning and management of the Nation's water resources.

Our Changing Continent (16p.)

Discusses the evidence and techniques scientists use to reconstruct the history of the changing land surface of the North American continent.

Permafrost (16p.)

Defines permafrost and summarizes its geographic distribution. Explains how construction activities alter local permafrost conditions and discusses how best to counteract unfavorable changes.

Prospecting for Gold in the United States (20p.)

Describes various kinds of gold deposits and their locations. Offers a brief review of the problems faced by present-day prospectors and lists available maps and services.

The Quiet Revolution in Mapping (16p.)

Describes the increased use of automated equipment in producing maps and how this equipment can be used to collect, organize, and disseminate cartographic data tailored to a customer's needs.

Rain: A Water Resource (8p.)

Provides information on the annual precipitation in areas of the United States, with specific data on several major cities. Explains how to express rainfall as quantities of water. Also available in Spanish.

Replenishing Non-Renewable Mineral Resources (16p.)

Discusses how later discoveries can revise earlier predictions of quantities of non-renewable mineral resources due to changes in economic and technologic factors.

River Basins of the United States: A Series (10p. each)

Lists basic facts including historical notes, flow characteristics, and physical statistics on selected river basins of the United States. Discusses the Colorado, the Columbia, the Delaware, the Hudson, the Potomac, the Suwanee, and the Wabash Basins.

Safety and Survival in an Earthquake (12p.)

Describes the hazards posed by earthquakes and offers instructions for individual action before, during, and after a tremor to minimize loss of life and damage to property. Also available in Spanish.

The San Andreas Fault (20p.)

Describes the nature, behavior, and earthquake history of this major fault system that extends from northern California to the Gulf of California.

A SPRING TRIP

By Roger K. Pabian

On Saturday, April 13, I left for a week-long trip to visit professional colleagues, observe some cyclic deposits in the Devonian rocks of Ontario and Pennsylvanian rocks of Michigan, to give a lecture to the the Midwest Mineralogical and Lapidary Society of Dearborn (Michigan), and attend the North Central sectional meeting of the Geological Society of America at Toledo, Ohio.

On the first day of the trip I visited colleague P.H. Heckel at the University of Iowa in Iowa City and we brought each other up to date on research we have been doing on late Pennsylvanian rocks in the North American midcontinent. I was pleased to learn that many more or less continuous Pennsylvanian age marine units have been observed in the Appalachians and that correlation of these units with midcontinent units appears to be some of the future work in stratigraphy. I looked through some wash samples that Phil had collected in Kansas and found plates from some unusual echinoderm, probably an echinoid, but one I had not seen before. I stayed in Ottawa, Illinois, that night and on the following morning had a delightful breakfast of artificial orange juice, which I could not drink, and medium-rare pancakes.

The second day of the trip involved getting to Dearborn Heights, Michigan, where I was the guest of Ceil and Jerry Duluk for the next three nights. Monday, the 15th was spent at the Geology Department of Wayne State University, Detroit, where curator David Lowrie, allowed me access to their excellent collections of great historic and scientific value. Wayne State's collections include the Goddard Collection that has many fine agate specimens from the midcontinent. I photographed some of this material and took notes on things that will aid in the new update of Minerals and Gemstones of Nebraska. I also observed quite a few fossil specimens from the Devonian and Pennsylvanian of Michigan and made notes on some of these. The Detroit area has one of the country's highest concentration of Arab-Americans and we had lunch in a very fine, small Lebanese restaurant near the campus. Delicious cuisine and easy to digest, lots of fiber, little cholesterol, and tasty.

Tuesday, the 16th was spent looking at Middle Devonian strata and collecting fossils in the Arkona and Thedford, Ontario, Canada areas. The Devonian fossil occurrences parallel those we see in the late Pennsylvanian and Early Permian of the midcontinent and there is almost a species-by-species substitution of these animals from one age to the other. The Devonian strata there appears to have been laid down in cyclic deposits not unlike what we see here.

In a complete turnabout, our stop at Canadian Customs was lengthy and our party was quite carefully inspected. We were delayed for about a half an hour. We found out that the excessive amount of photographic and projection equipment was unusual for a party of four. I had agreed to give a program to the Dearborn club that night and we thought we could save about 15 minutes if we took the projection equipment with us rather than return to the house to pick it up. Guess again. U.S. Customs waved us through on the way back.

I presented a program on Lake Superior Agates to the Midwest Mineralogical and Lapidary Society of Dearborn that evening and I guess that there were more than 200 people in the audience. I took along a packet of Nebraska Bedrock Maps (250) to pass out at the

meeting and almost all were taken. I did take orders for Record in Rock and Minerals and Gemstones of Nebraska and they ordered enough to keep our publication sales busy for the better part of a day. The lecture was well received and I would gladly talk to that group anytime.

On Wednesday, the 17th I departed for Toledo, Ohio, to attend the 25th annual meeting of the North Central Section of the Geological Society of America at the Seagate Convention Center. I was intrigued by the number of county-2 Nebraska license plates that were in the parking facility as only one other Nebraskan was registered for the meeting. There was a big bowling tournament going on in the center along with the meeting. The tournament started last February and was scheduled to go on for 113 days. It was the American Bowling Congress regional and the Nebraska bowlers were scheduled for the same time as the GSA meeting. I visited with quite a few of the Nebraska bowlers.

The Riverview Inn was one of the official convention hotels and I stayed there because it was close to the convention center. Mistake number 1. It was an updated Norman Bates' Motel. It was pretty well run down and the only insulation between the room and the outside was a slab of reinforced, pre-formed concrete that was about 1 1/2 inches thick. From the time I left Dearborn Heights until I got back to Lincoln, I was never warm again. After checking in, I took all of my bags up to the 11th floor and tried to get in my room. The key didn't fit the lock and I had to carry all my stuff back down to the lobby. They found a maintenance person and gave him a bunch of keys and he finally found one that unlocked the door. One of my fiends who works with the Illinois Geological Survey didn't get a key to his room until the morning of the last day of the meeting and had to have maintenance let him in his room every time he came back to the motel. Someone entered my room and made a local phone call for which I had to pay. The help at the desk thought I was raising a stink over 75 cents, but my real gripe was that security was so lax and my person and property was not safe there. The water taps on the sink provided only hot water so I had to go to the ice machine to get ice cubes to cool the water to drinking temperature. I understand the astronomers society gave this motel a four black holes rating.

In spite of the motel woes, the professional meeting part of the trip was an outstanding success. On Thursday, the 18th, Pete Holterhoff, one of my former students, now at the University of Cincinnati, Ohio, and I presented a poster session on generic reorganization and replacement of crinoids in the Ervine Creek-Curzon Limestone interval in Nebraska and Iowa. It was very well received and our cartographic section did an exceptional job of preparing and laying out the fairly complicated graphics for which we had only a few computer printouts to give them. Although some poster sessions presenters had access to much more sophisticated graphics packages than we had, they seemed to want to show that they could produce 35 fonts of type and 62 colors, each on the same diagram. There is no substitute for skill! I think that I will put in the poster session as part of the 1992 show displays. It is really nice.

On Friday, the 19th, I took part in an invited symposium on museums and geological surveys as resources for earth science teachers. Mark Camp at the University of Toledo organized this session and it was very exciting. I had never considered it before, but most youth comes into contact with the sciences through the earth sciences. That is why it is so important that earth science teachers be well versed and have ample resources. There were many excellent presentations and I brought back a

lot of good ideas and hope I had some to share with my colleagues. My own presentation dealt with development and distribution of resource materials in Nebraska. It was interesting to observe that many geological surveys and museums are relying on gem and mineral clubs to help carry their message to the public.

The local Toledo rockhound club had several displays of more or less local gems, minerals and fossils to help acquaint convention attendees with the geology of that area. The meeting part was excellent to outstanding.

The drive back commenced on mid-afternoon, the 19th, and I planned on stopping in Iowa City. There were no motel rooms that evening because of a bowling tournament there, so I decided to drive on to Grinnell, Iowa, where I spent a somewhat uncomfortable night because there was a track meet going on at the college and the motels were full of boisterous participants.

I got back to Lincoln mid-afternoon on Saturday, the 20th, and, much to my surprise, found that the Richardson-Pawnee county field guide had come back from the print shop. I was glad to see this long project finally completed. It rained almost all the time I was on the trip and only saw sunshine once during that week. The sun was shining when I got back to Lincoln and I began to get warm again. +++

ABOUT FRACTALS

By Roger K. Pabian

In our short presentation at the April meeting the word "fractal" was used several times. It is a word that is unfamiliar to most people but will probably find growing use in languages in the years to come. The word fractal was coined by Benoit Mandelbrodt, a mathematician at IBM sometime late in the 1960's. In its simplest sense a fractal is a mathematical model that is (1) statistically simple, and (2) self-repetitive at all scales. Fractals are studied as part of the mathematical endeavor called chaos which involves the geometries of chemical and physical reactions in nature and self-organizing structures.

As a mnemonic device, I like to think of fractals in an Elizabethan era sense that I learned in a sophomore English Shakespeares course. The Bard's universe consisted of the macrocosm (ranging upward to the infinitely large) and the microcosm (ranging downward to the infinitesimally small). The same patterns repeat themselves at any of these scales. We see similar patterns in nature ranging from the spirals of slime-mole growth to wind-currents to spiral galaxies. Banded agates fall within this micro- to macrosom. Hence, they are a fractal expression. Scalar-repetitive structures can be observed in the same agate.

Dendrites and sunbursts in agates can be viewed as fractals. Fractal images of these structures can be computer-generated and they can be reproduced in chemical reactions in the laboratory. The former structures have been shown to form at higher pressures and the latter at lower pressures. Modern physics and mathematics will give us some new insights into many gems as well as other geological phenomena such as coastline development, stream patterns, and geological structures such as folded and faulted rocks.

As primers for the above, I would suggest reading any of the popular publications on chaos that you can find at almost any book store or library. A particularly good short paper is "Self Organizing Structures" by B.F. Madore and W.L. Freedman in American Scientist, 75(3), pages 252-259.

JASPEROID

A concept that should probably be embraced by lapidaries is that of jasperoids. Jasperoids are in the simplest sense limestones that have been replaced by silica. T. G. Lovering (1972) in the U.S. Geological Survey Professional Paper 710, "Jasperoid in the United States--its Characteristics Origin, and Economic Significance" has described it as a carbonate rock that has been hydrothermally altered and commonly replaced by quartz.

Lovering stated that replacement of carbonate rocks was most common but that shales, mudstones, and extrusive igneous rocks could also be altered by silica replacement. Replacement most commonly occurred along localized faults and fracture zones as well as along permeable zones of sedimentary rocks.

Lovering's chemical data showed that jasperoids ranged from about 80 to 99 percent silica, and he demonstrated the presence of numerous accessory minerals including barite, calcite, chalcedony, limonite, opal, and pyrite. Some accessories are unreplaced inclusions in the host rock and others formed contemporaneously with replacement.

Lovering described in place jasperoid in 28 of the 48 conterminous states and Alaska. Our collecting and lapidary experience shows that many of the jaspers we have found in the glacial tills and river gravels of Nebraska are probably jasperoids, some of which can be related to source areas and others which cannot.

For lapidary purposes, jasperoids have a less tight structure than do stones we think were initially precipitated as jaspers. This probably reflects the crystalline nature of the replaced rock. Jasperoids appear to contain more diverse patterns and color combinations than do jaspers. Microscopic examination should tell you for sure whether the stone is a jasper or jasperoid. RKP

FOR THE GEM DIG

The program at the may meeting will give each and every attendee a chance to find his or her own precious gems in ample quantities. You will need to bring along a few items to help you out and obtain the best results.

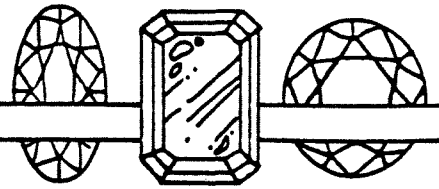
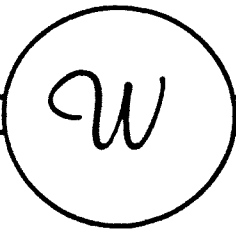
First, a light source such as a good flashlight with fresh batteries or, better yet, a clamp-on kind of high intensity light will make the gems show up a little better.

A pair of tweezers will be helpful. Utility tweezers will be of much more use than surgical tweezers, and a lot less expensive. If you don't have any, get them at a hardware, craft, or hobby store.

A small container to put your gems in will be helpful. Small, "zip-loc" (TM) envelopes can be of great utility. Paper envelopes will become wet and the glue will part. A 35 mm film canister with a half-inch cross cut in the lid is helpful. If you drop it, the stones stay in the container.

Some gems such as the corundums (ruby and sapphire) fluoresce so an ultra-violet light can be helpful, but you will recover only the fluorescent stones this way. Use only long wave for this technique as short wave ultra-violet requires eye protection.

Bring the family---enjoy the dig in the Bethany Park Pegmatite. +++



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