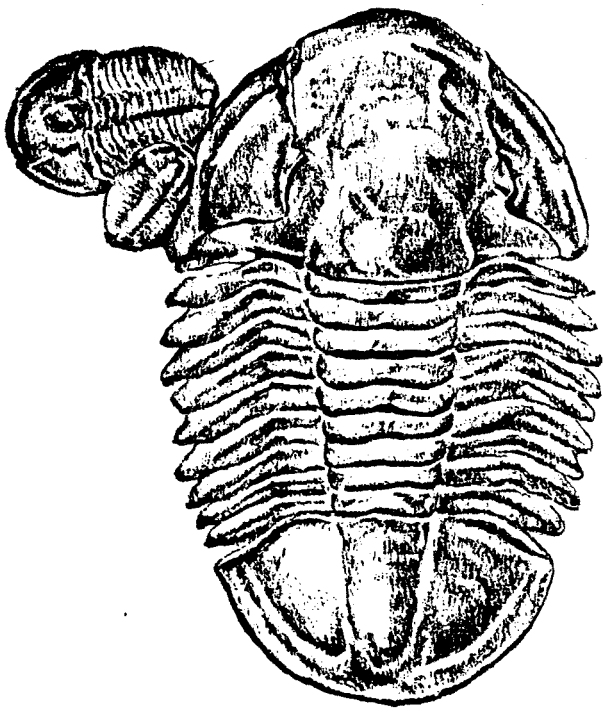
PICK & SHOVEL

FEATURING---

FOSSILS



Volume 29, No. 8
April, 1989

Lincoln Gem and Mineral Club, Inc.
P. O. Box 5342
Lincoln, Nebraska 68505

1989 ELECTED OFFICERS

President: **Fred B. Holbert,**	2822 S. 13th St., Lincoln, NE 68502	423-5639
1st Vice President: **Gerald Moore,**	2305 S. 35th St., Lincoln, NE 68506	489-4184
2nd Vice President: **C. David Heffelbower,**	1819 Washington St., Lincoln, NE 68502	475-4713
Secretary: **Vera Lyman,**	420 N. 56th St., Lincoln, NE 68504	464-6089
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: **Donald Phillips,**	5901 Spruce St., Lincoln, NE 68516	489-7637
Board Member: **Shirley Rockel,**	1134 West Avon Lane, Lincoln, NE 68505	464-3059

NOMINATIONS COMMITTEE

3 Years: Kevin Schwartman, Chair.
Roger Pabian
Eddie Ridge,
2 Years: Phyllis Parks, Janet Wright
1 Year: C. David Heffelbower,
Bill Rockel

LONG RANGE PLANNING AND BY-LAWS COMMITTEE

3 Years: Kevin Schwartman,
Jim Marburger
2 Years: Bob Wright, Linda Parks
1 Year: Claude Scott,
Phyllis Parks

STANDING COMMITTEES

Calling: Shirley Rockel
Education: Roger Pabian
Field Trips:
Historian: John & Lillie Lewis
Hospitality: Wilma (Billie) Heffelbower
Membership: Gerald Moore
Housing/Property: Jim Parks
Junior Activities: Janet Wright
Librarian: Jim Parks
Membership: Gerald Moore
MWF Liaison: Vera Lyman
Programs: Francis Belohlavy
Scholarship: Marie Taylor
Christmas Party: Billie Heffelbower
1989 Rockhound/Year: Roger Pabian
1989 Show: John Harrison
1990 Show: Roger Pabian

AUDITING COMMITTEE, 1987-1988

Shirley Rockel
Don Phillips
Francis Belohlavy

YOUR PICK & SHOVEL STAFF

Publisher: Lincoln Gem & Mineral Club, Inc., P. O. Box 5342, Lincoln, Nebraska 68505
Editor: Roger Pabian
Business Reporter: Vera Lyman
Financial Reporter: Phyllis Parks
Circulation : C. David and Wilma Heffelbower

CALENDAR OF EVENTS

APRIL MEETING: Saturday, April 22, 7:30 PM
Norfolk Room, Nebraska Center
33rd & Holdrege Streets

PROGRAM: Slide presentations. Part 1. Field trip along the Missouri River, in South Dakota. Part 2. Field trip for barite in Washington County, Missouri.

JUNIOR MEETING: 7:00 PM. Program: Field trip planning.

April 1989

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24	25	26	27	28	29

COMING EVENTS: April 14-16, Macomb, IL, Mid-America Paleontological Society, Show

April 21-23, Hastings, NE, Central Nebraska Gem & Mineral Society, Show

WELCOME: The below applicants have been approved for membership:

John and Barb Mapes, 3600 Mojave Dr., 68516, 421-2045
Thomas T. Wright, 144 No. 13th St., 68508, 489-9417

The former members have been reinstated:

Abel, John & Family, 2829 Van Dorn, 68502
Fixter, Robert, 1805 Sumner, 68502, 476-1885
Hames, Aaron (Junior Member), 2955 Wendover, 68502, 474-6298
Johnson, J. Rock, 1326 No. 21st, 68503, 474-0202
Quinn, Grant & Goldie, 4617 Tipperary Trail, 68512, 423-0569
Wittman, Mrs. Ollie, 3415 East Pershing Road, 68502, 423-4100

The club has some exciting plans and programs for 1989. We hope that all of you will join us in some of the upcoming educational programs that we have planned. We bid you a hearty welcome.

REGIONAL SHOWS

Del Mar, CA	Hickory, NC	Kalamazoo, MI	Portland, OR	Stillwater, OK	Arlington, TX
May 12-14	Apr. 28-30	June 22-25	June 8-11	July 14-16	June

ON THE COVER---

Middle Cambrian trilobites from Utah. These specimens are about 550 million years old. They were found in the classic Wheeler Amphitheater locality in Millard County, Utah. They are (large) Asaphiscus wheeleri Meek 1873; Elrathia kingi (Meek), 1870; and Bolaspidella housensis (Walcott), 1886. Magnification about X2. Illustration by Mary Tanner.

PRESIDENT'S MESSAGE

Congratulations to Harrison & Company for great gem show. We believe that the change of show location is certainly starting to pay big dividends and who could argue about the cooperative weather. However, the big star of the show was the entire club. What a display of active participation. Not only did we have a large quantity of displays, but also excellent quality.

In addition, it is great to see so many new and reinstated members. Those of you who are joining our group for the first time, welcome; those who are returning, we've missed you.

IMPORTANT: We will have a short study group organizational meeting after the next general meeting. The response has been great; so far 25 people have shown interest in the study groups and have indicated an interest in multiple areas of activity. Among the things to be discussed will be how many groups are to be formed initially; what areas of activity will be included in each group; the most convenient meeting night; the frequency of meetings; meeting sites; group leadership; group resources; and we will relay the computer analysis of the study group poll. In order to keep this meeting short, we will prepare a short questionnaire which you may complete at your convenience and return later. One of the more important items to be discussed will be to elicit interest in a field trip to Minnesota this summer.

STUDY GROUP FIELD TRIP:
Our thought is to provide some knowledge and experience in some areas of Minnesota so that those who are interested can participate in a field trip. Some people may want a guided trip, others self-guided; some may want a general sampling of the area, others may want to go to a specific area for their particular interest; and some may want to take a long weekend, others longer;

Some of the possibilities are as follows:
1. Moose Lake area: Moose Lake Days (Laker festival & gem show); large active gravel pits (Lakers & Mary Ellen jasper); gravel roads & concentrations of lakers.
2. Cloquet: Frank Lloyd Wright designed gas station (only one in world). historic pits in area (lakers); city pit (lakers); near Duluth/Superior (beautiful lake bluffs).
3. Carlton: Central to entire area, inexpensive motels & food; Jay Cooke State Park- camping (simply gorgeous).
4. Iron Range country: Mesabi, Vermilion, & Cuyuna iron ranges; Chisholm-Iron Range Interpretive Center over looking ore pit (excellent museum and local club site). Great geology, some lakers, hiking to bottom of pits; Hibbing - U.S. Steel open pit; Virginia- open pits, huge ore truck; Tower Sudan Mine (deep mine shaft museum); Calumet - range area gem show (small) & day of rock hunting & day of fossil hunting (though the Hill-Annex mine is not operating, the mine owners bring heavy equipment to expose fresh rock and fossils. Last year a young boy discovered an entire crocodile fossil. We remember this as being the only complete crocodile ever to be found in Minnesota)

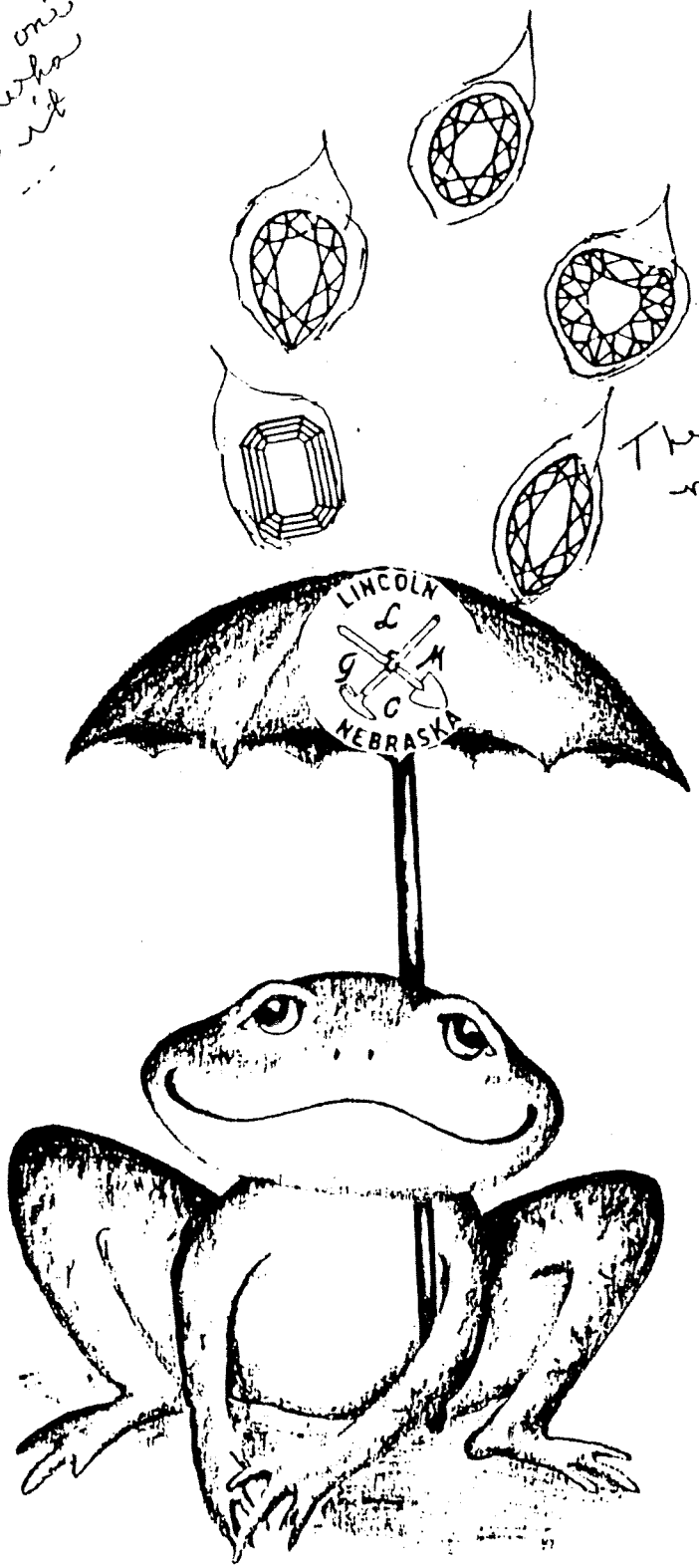
The area provide hunting for the following: Rocks - Lake Superior agates (Lakers), Mary Ellen jasper, Silkstone, Binghamite, Hematite, taconite, etc.; Fossils- (Cretaceous & Jurassic)- shark teeth, fish, marine crocodile, mosasaur teeth, ammonite, coiled cephalopods, clam, snail, coal, carbonized wood, pollen grains, leaf impressions (ferns, conifers, deciduous trees); and also geology study, golfing and fishing.

We will order (at cost) county maps and geologic books and provide information in advance of the trip.

Fred B. Holbert

April
Sunshine Corner

The Show was great! Showers of Praise to one and all who made it work ...



The Easter Eve meeting was a real hopping affair - good program, coffee, and lots of rock talk

Best Wishes
Billie Sunbeam

THE LGMC Junior Show Report:

At the show the Juniors earned $41.00 dollars by selling chalcedony roses and magazines. This money will be used to help support the youth activities in the future. Many people were saying that the Junior Displays were the best that they have ever been. The Juniors received many beautiful mineral specimens, geodes, and polished agate slabs from Mike Smith. Roger Pabian also donated a whole bucket of slabs for us to use in lapidary class. A BIG THANK to both of you. If it weren't for the adult support the LGMC Juniors wouldn't be growing like they have the last two years. At the show we collected the names of fifteen prospective Junior members. We are looking forward to having each one of them join our group.

LGMC JUNIOR
REAGAN WRIGHT

THE APRIL MEETING WILL BE A TIME FOR SETTING UP FIELD TRIP DATES. BE SURE TO BRING YOUR CALENDARS TO THE MEETING !!!!

IF YOU HAVE A SPECIMEN THAT HAS NOT BEEN IDENTIFIED YET BE SURE TO BRING IT ALONG TO THE MEETING. WE WILL TRY TO HELP YOU WITH NAMES FOR YOUR ROCKS AND MINERALS.

Thanks Mike and Roger

Thank you, NORMA MILLER

FOR THE MINERAL SPECIMENS AND CHALCEDONY ROSETTES THAT WERE VERY POPULAR ITEMS FOR THE JUNIOR TABLE

LINCOLN GEM & MINERAL CLUB, INC. - BOARD OF DIRECTORS - March 6, 1989

Nebraska Hall - Room 115 7:30 P.M.

Meeting was called to order by President Holbert. Minutes of the Feb. Meeting were read with motion for approval by Roger Pabian, 2nd by Phyllis Parks. Carried. Treasurer's report for Jan. & Feb. were read with motion for approval by Francis Belohlavy, 2nd by Dave Heffelbower. Carried.

BILLS: Paid but presented for approval:

$	11.55	Vera Lyman, Postage & Secretary Expense for 1988
	83.50	Postmaster (500 pre-cancelled stamps)
	10.55	Impressions Ink - 200 Swap Flyers
	76.54	UNL Printing - Jan. P & S
	11.58	John Lewis, Historian (Notebook, etc.)
	25.00	Vera Lyman, 34th Anniversary Cake
	15.00	Tom Rule, (replaces Ch# 2163 from 7/88)
	25.00	Postmaster (12.50 for Swap & 12.50 Show) Stamps
	18.00	NAOESCI - Gem Palette Subs.
	149.98	NE Center - Jan. Swap (Rent double rm 75.00; 70.98 coffee & Tax 4.00 Program)
	20.00	Jerry Moore - 2 Jr. Lapidary Classes

Motion for approval by Roger Pabian, 2nd by Vera Lyman. Carried.
Phyllis Parks made motion to dispense listing bills twice. 2nd by Dave H. Carried.

For Payment and approval:

$	11.18	Refreshments & supplies for Feb. Scholarship Mtg.- Vera Lyman
	10.79	Vera Lyman - '89 WHO'S WHO Printing
	100.00	UNICO (formerly Reynolds, Simmons, etc) Officer's Bond
	100.75	UNL Printing - Feb. P&S
	14.10	Phyllis Parks - (Copies - Financial Rpts)
	50.00	Friends of Museum - '89 Memb.

Motion for approval by Gerald Moore, 2nd by Francis Belohlavy. Carried.

SHOW BILLS: Paid but presented for approval:

$	219.00	Gems - 150# Sapphire Concentrate
	124.17	Impressions Ink - Cert of Apprec. 10.98, 1000 half sheet flyers, Artwork 33.05 Disc. postcards 45.84
	81.00	Postmaster - 500 stamps @ 13.2 Bal @ 15¢
	2.90	Gerald Moore - Phone calls
	4.00	Phyllis Parks - 2 regis letters
	9.58	Phyllis Parks - Misc expense
	62.45	Page Trophy - Ribbons for '89 Show

Motion for approval by Francis Belohlavy, 2nd by Roger Pabian. Carried.

For payment & approval:

$	13.17	Roger Pabian - Publicity expense
	275.00	Alexander & Alexander - Show Liability

Motion for approval by Gerald Moore, 2nd by Francis Belohlavy. Carried.

OLD BUSINESS:

Insert card in P&S requesting interest information on study groups.
Chet Ager Day very successful. Can have date again next year.
Christmas Party Rm rate not settled yet (re charges).
FRIENDS OF MUSEUM: Motion by Vera L. that we contribute $ 50.00 this year. 2nd by Roger P. Carried.
Vera L. received card from 4th Grade Science Class requesting rocks & minerals. Board decided good project for JR. group. Letter turned over to Jan.

Board Meetings: April 3 & May 1 @ Rm 115, NE Hall.
General Meetings: April - Scottsbluff Rm May - Bethany Park, if available.

Respectfully submitted
Vera Lyman
Vera Lyman, Secretary

President Holbert called the Lincoln Gem and Mineral Club to order at 7:30 p.m. on March 25, 1989 at the Nebraska Center.

John Harrison moved we accept the minutes as printed in the Pick nd Shovel. Mike Smith seconded. Carried. Helen Bagel moved that we accept the treasurer's report as printed in the Pick and Shovel. Jerry Moore seconded. Carried.

Hospitality Chairperson Billie Heffelbower reported 35 members present and one guest - Francis' Mother, Mrs. Belholvy.

Old Business: The study group cards that were in our Pick and Shovels should be turned in soon if interested. These are needed as soon as possible so future plans can be made. Information must be gathered so we can get something going by next month. The Board will set a loose format and appoint a coordinator to form a group(s) and go from there. (Many of the cards were turned in at the meeting)

Grant and Goldie Quinn were welcomed back to the Club.

New Business: Phyllis will need the show bills before Tuesday.

Committee Reports:

John Harrison:

. Very good show. He is proud of our Club. There were 140 displays which is very commendable.

. There were no problems or incidents.

. He commended all for making this show what it was.

. There will be a show committee meeting on Tuesday March 28, at the McDonalds on South 48th and Van Dorn at 7:00 p.m. We will meet for one hour to discuss problems, concerns, and ideas. This information will be passed on to all club memb ers. This should help to make next year's show even better.

. Per count, 1,992 paid admissions were reported, with 1,180+ entering on Saturday and the remainder on Sunday. This was an 11% increase over last year. $3,718.50 was taken in as receipts. This does not include those entering under the age of 8 years.

. We ran out of appreciation certificates and had to purchase more which added to our pride since we had so many more exhibits this year. Good work to those who exhibited!

. Again Mr. Harrison thanked all for making our show so great.

. The unpaid attendance was estimated between 150 and 200.

. Mr. Harrison thought it "paid off" to send out the cards with the 50¢ reduction on fees.

Phyllis:

. From the show we had four reinstatements, two families and 1 applicant.

Billie:

She could have sold tickets after the doors closed both days. She asked all to stand who held a chairing position for a round of applause. Fred then asked all to hold up their hand who had anything to do with the show - which was most of those present.

Someone suggested that awe let school children and sponsors attend or Scouting groups or any other such organization with a reduced gate fee. School princpals do not pass on this information as

readily as we would wish. Also, transportation, insurance and the fact that teachers do not wish to tour on weekends would be some factors with this suggestion.

Fred:

.Tne weather played an important factor in such a successful show.

. Only 89 more members attended than in last year's show.

. We should count our blessings. Pershing is the main reason for our good attendance. We also had a good show committee.

. We generated approximately $500 more at the gate than last year. Fred has credited this to the work of the Club members. Many did not bring in their cases last year as only 60 cases were displayed in 1988. This year's case display will have a profound effect on sthe show.

. Dealers were very impressed with the displays make notation that some were excellelnt.

. Phyllis' son and grandson were commeded for all the work they did.

.d Our next Board meeting will be April 3 at the Nebraska Hall.

Kevin:

. Cabashon Awards were awarded as follows:

3rd prize - Lyn Wells. - $10
2nd prize - David Heffelbower - $15
1st prize - John Lewis - $25

. He thanked all who entered and would like to see more stone competition next year.

Jim Parks:

. Has three new books plus the book given by the Heffelbowers. Fred read the auction bill for the sale at Walt Hill and also announced other show dates in the area.

. April 16 Encounter center at the Museum

May 20 - meeting at Bethany Park

Phyllis announced that the Nebrask Association of Earth Science membership cards were ready. Many of these were passed to the members after the meeting.

David moved that we adjourn.

Francis had a very interesting program of videos. One was on the Geology Day at Chet Ager Nature Center. Everyon enjoyed seeming him/herself on video and enjoying the wild life .
Tne second video was entitled Gold Dreding in Idaho.

Respectfully submitted,

Shirley Rockel, Acting Sec.

LGMC Treasurer Report for March 1989

NBC Checking Account Balance 3-1-89 $561.31

Cash Receipts -

'89 Dues & Registration/Reinstatement	53.00	
'89 Gem Palette Sub.	2.00	
Sale of Membership Pins	2.25	
Prior year adv. Pick & Shovel	45.00	
Juniors at show	41.00	
Fossils for Scholarship at show	14.03	
Donation to Geology Scholarship	25.00	
Suspense-Members Buffet Dinner	285.00	
1989 Show Gate	3718.50	
1989 Dealer space	275.00	
Miscellaneous income	306.07	4766.85
Transfers from Money Market Acct. prior to show		1500.00

Payments made in March -

Junior fund for Lapidary classes	20.00	
Lists,copy for audit,prep.for cases	14.10	
February Meeting refreshment	11.18	
Who's Who	10.79	
February Pick & ShovelPrinting	100.75	
Officer Performance Bond/Ins.	100.00	
Friends of Museum Dues/Donation	50.00	
Friday Show set-up expense	42.84	
Membership Information Sheets	1.32	
Precancelled Stamps P & S	83.50	
Security Storage - 6 mo. @ 30.00	180.00	
Nebr.Center Meeting & Coffee & Equip.	101.76	
City Parks/Rec. Bethany Shelter-May	25.00	
UNL Printing/Dupl. March P & S	127.14	
Prepayment Deposit 1990 Show-Pershing	300.00	1168.38

Show Payments made in March -

Postmaster - for discount card mailing	81.00	
Insurance	275.00	
Sat. Nite Buffet (includes 285.00 Susp.)	591.00	
Security	288.00	
Recognitions	74.93	
Balance contract plus drapes & cover	1616.70	
State club Display Competition	25.00	
Cabochon Competition	50.00	
Cases for Club use at shows (5)	185.00	
Table Cover & tape	137.22	
Rock Race Expense	32.65	
Sapphire Dig Expense	15.58	
Hand Out Programs	81.23	
Publicity	193.26	
Misc. Show Expenses	61.18	
6 Guest Programs @ 25.00 each	150.00	3857.75
Total paid out		5026.13

NBC Checking Account Balance March 31, 1989 1802.03

Fossil lapidary materials

By Roger K. Pabian

Fossil materials provide the lapidary with a great deal of materials to cut, polish, carve, and work in many fashions. You need not peruse the classified advertisements in the trade journals for but a few minutes to fine one or more examples of fossil lapidary material.

Some of the oldest fossil material used for gem purposes is probably silicified algae from Precambrian rocks of the Canadian Shield. This material is often found in Minnesota where it is called **Mary Ellen Jasper**; it is usually red and yellow and the algal heads make some fine patterns for cabochons.

In our local Pennsylvanian and Permian sedimentary rocks, examples of both **solitary** and **colonial corals** have been utilized by gem cutters. Crinoid stems have also been used for gem purposes. American Indians in the area used them for beads before glass ones became available. Fossil Devonian Age coral in Michigan, called **Petoskey Stone**, has been a lapidary favorite for many years. Plastic polishes will put very high lusters on these soft materials.

Dinosaur bone is also a favorite gem material of many lapidarists. Most of the gem dinosaur bone comes from the Jurassic Age Morrison Formation that is exposed in Colorado and Utah. It is extremely porous and takes up polishing compound---this unfortunate situation can be relieved by finishing the stone with black rouge or by utilizing a black magic marker over its surface. Wipe it clean with alcohol after the darkening treatment. Dinosaur coprolites have also been used for gem purposes. Loose fragments of bone can be used, but don't tear up a whole skeleton to get a cabochon.

Amber with or without insect inclusions has always been a popular gem. The Baltic sources were well known in even Roman times. Much amber is still seen advertised in gem and mineral publications. Amber with insect inclusions has been faked by melting low grade amber and adding the insects to the resin. This material often has too many insects of the same species, usually all on the same plane, in the same piece.

Ivory from **elephants** and **walruses** is a popular lapidary medium. Much of this material in fossil form is offered for sale by dealers, so there is no real reason to demand the material from living animals. Let's give our hard-pressed wild life a chance to live by using only the fossil ivory. Numerous scraps of fossil ivory that can not be associated with fossil animals are available for lapidary use.

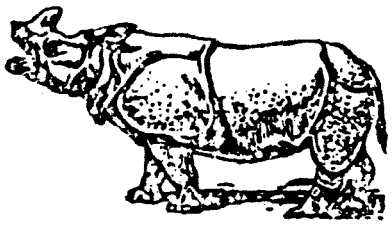
Agatized wood is a very popular lapidary material and it is fairly common in most places in the United States. Nebraska has a great deal of agatized wood, much of which is extremely colorful. The area around Chappell, in Deuel County, has been a favorite collecting area for many years. Similar woods have been found in gravels of the South Platte River and its' terraces. Some of this wood has excellent dendrites, and full rounds have sometimes been found. The Triassic Chinle Formation in Arizona has produced some excellent agatized wood; excellent examples are known from areas outside the Petrified Forest National Monument.

How about **agates** and **opal**? Both of these favorite lapidary materials may be products of soil formation and actually represent **paleosols** or fossil soil horizons.

As you can see, the connection between lapidary and paleontology is a bit closer than many would think. We should always remember not to destroy existing life to gain lapidary material, and we should strive to not damage in place fossils for lapidary material.

RHINOCEROS, FOSSIL HISTORY
by Sue Ayres, North Highlands, CA, member of FFF

The rhinoceros fossil history is complicated to trace because they have no main branch of development; instead of a family tree they have a family bush.



These flat-headed odd-toed ungulates tend to grow to a large size with barrel shaped bodies on stout limbs. Through the process of evolution their feet specialized for weight bearing with short digits and a spreading foot. The rhino started slow reduction of the first and fifth digits, the metarus elongated while the astraglus, calcaneum and navicular bones became more ordered to restrict the lateral movement of the ankle joint so they could run faster. Many also developed horn-like structures of agglutinative fibers on their nasal bone. Herbivorious animals, predominatly browsers, they lived on a diet of leaves, twigs, fruits and shoots.

The rhinoceros are in the super-family Rhinoceratidae, which belong to the order perissodactyla in which horses and tapirs also fall under. Rhinoceratidae is in turn divided into three families:

1) Hyacodonidae - the "running rhino" were the most primitive of the group. They were hornless creatures about the size of a wolf with long slim legs. Their development was along similar lines to that of the horse. It is thought they died out during the Oligocene because they could not successfully compete with them for the same life-role and by mid-Miocene they were extinct.

2) Amnodontidae - these amphibious rhinoceroses were similar in build to the hippopotamus and their fossil remains found in sediment indicate that they too lived in rivers. They developed first in North America during the late Eocene and spread throughout Eurasia. They were quite common in Asia during the Oligocene where they lasted for millions of years after their extinction in Europe and North America; dying out in the Miocene.

3) Rhinoceratidae - these were the true early rhinoceroses of which there were many genera and from which modern rhinos descended. They first made their appearance in the northern hemisphere during the early Bridgerian (Eocene - 45 to 49 million years ago) and reached their peak in late Oligocene, early Miocene, with over 30 genera and 100 species. They ranged from Europe, Asia, Africa and North America, never making it to the other continents as there were no land masses connecting them. In North America one species of Deceratherium did get as far south as what is now the Panama Canal Zone. It was less than 6 feet long with transverse horns. The fossil remains found dated back to the Miocene.

Continued on page 10

When North America and South America finally did hook-up it was too late for the rhinoceroses. Only the species Teleceras, a short-legged, amphibious creature, was able to survive to the end of the Pliocene. The Rhinoceroses became extinct in North America due to the dramatic climatical and geological changes that developed. With the rising of the Rockies and the northwestward shifting of the continent, the average temperature and rainfall started dropping and the flora changed from tropical, sub-tropical (which the rhinoceroses favored) to grasslands that spread rapidly. The rhinoceroses' bodies did not diversify enough for the changes in their diet so they could not compete with the ruminants. The grasslands created another problem for them. For where the ruminants could quickly graze then find a place to hide and chew their cud, the rhinoceroses could not; therefore, they were longer exposed to danger from predators. Their Eurasian cousins on the other hand did not have this problem to contend with so were able to to flourish.

The Giant Rhinoceros or Indicotheres were the largest land mammals to ever live. They inhabited Eurasia from Oligocene to early Miocene and probably had the same ecological role that the giraffe has today. The hornless giants Baluchitherium stood 18 feet at the shoulders and 27 feet to the crown of their head. They were 27 to 28 feet long and probably weighed 20 tons. Also included in the family of giants were Indricotherium, Paraceratherium, Aceratherium, Aralotherium, Thaumastotherium and Benaratherium. Elasmotherium was another member of the giants. It is the only genus of extinct rhinoceros from the Pleistocene. They were large elephant-size with a huge frontal horn up to 6 feet in length. They were named for their teeth which had wavy strap-like outline of enamel somewhat like horse teeth in pattern. They were very high crowned and efficient for grazing.

Today there are five species of rhinoceros left in the world belonging to four genera. They inhabit a small part of Southeast Asia and Africa.

In Asia there are three species, Dicerorhinus sumatrensis, and the two "unicorns," Rhinoceros unicornis and Rhinoceros sondaicus.

Dicerorhinus first appeared in Mid-Oligocene and still exist in the form of Dicerorhinus sumatrensis, the Sumatran Rhino. It is the oldest genera of mammals in existence proceeded only by one or two genera of bats, such as Rhinophus (Horseshoe Bat that dates back to Eocene.) Dicerorhinus was widely represented throughout Eurasia as far northeastward as Siberia and northwestward as the British Isles.

The Sumatran Rhino inhabits both tropical rain forests and mountain moss forests near streams in the hilly countryside of Burma, Thailand, Malaysia, Borneo and Sumatra. They are the smallest member of today's family of rhinoceroses, standing only 4-1/2 feet tall at the shoulders. Their coat is grey and is covered with bristle-like hair. They have two horns on their nasal bone, the posterior one being the smaller of the two. They exist on a diet of twigs, bark, fruits, leaves and bamboo shoots. There is estimated to be fewer than 300 left in the wild.

Rhinoceros unicornis, the Great Indian rhinoceros, lives in the swampy grasslands of northeastern India and Nepal. It feeds on grass, reeds and twigs. The skin on their bodies is nubby and thick with deep folds which give them an armor plated look. Standing just over 6 feet at the shoulders, it is the largest of the Asian species. In the wild there are about 1,000 left.

In 1972 the Javan rhinoceros, R. sondaicus, made the Guinness Book of Facts and Feats as being the rarest placental mammal living. They once ranged from Burma through Malaysia, but at that time only a herd of 28 were known to exist in western Java. Today there are about 50 left on the Udjung Kulon Reserve. They are rarely seen and are monitored by their tracks. These hairless rhinoceroses stand roughly 6 feet at the shoulder. Their single horn is very short and sometimes lacking in the females.

The African rhinoceros differs from the Asian species in several ways. One is that while all the species are dependent on water, through the arid season, the African rhinoceros can go without visits to the waterhole 4 to 5 days. They also have longer horns, their skin is less deeply folded and they are lacking their incisors, which the Asian rhinoceros still retain.

The African Black rhinoceros, Diceros bicornis made its first appearance in late Plicoene, though its roots Diceros are in Miocene. Their heads are large and they have two horns, sometimes three. Their upper lip protrudes in the middle and its tip is prehensile. They feed on a diet of various bushes and shrubs but seem to prefer acacais. Weighing roughly two tons, they stand 5-1/2 feet at the shoulder. It is not known how many are left for estimations vary. At last count there were 4,000. Their numbers have been decreasing rapidly due to poachers.

The White rhinoceros Ceratotherium simum is the same color as the Black. They get their coloring from the soil they roll in. The White rhinoceros has a large wide mouth with teeth higher crowned than the other species as they are strictly grazers. Fossil remains found indicate they were widespread throughout Africa's savanna lands. Today in Northern Africa around the Nile region there is a sub-species C. s. cottoni of which there are less than 500 left in the wild. Two-thousand miles away in South Africa the southern species C. s. simum has made a remarkable come-back from near extinction due to conservation efforts and is no longer on the endangered species list.

For millions of years rhinoceroses survived but the age of man brought with it their greatest enemy. For since the ice age and the days of the woolly rhinoceros, Coelodonta antiquitatis man has hunted them for their horns and other body parts. With the development of guns they have been slaughtered ruthlessly. Ironic, for it is man who is now the rhinoceros' only hope if they are to make it to the twenty-first century.

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REPRINTED FROM: Dinny's Doins, published by Fossils for Fun Society, Sacramento, CA. Volume 24, No. 1, pp. 9-11, January, 1989

CARD OF THANKS

My brother, Howell Pabian, and I wish to extend our thanks to the Sunshine Corner and the members of Lincoln Gem and Mineral Club for their kind expressions of sympathy at the loss of our Mother, Virginia Pabian. Your sympathies will always be deeply appreciated.

Roger Pabian

DISPLAY MATERIAL

Display cases will be available at the April meeting. Bring along your favorite fossil or mineral or agate specimen, or whatever you wish to show.

MID-CRETACEOUS SHARKS OF NEBRASKA

Jim Kirkland

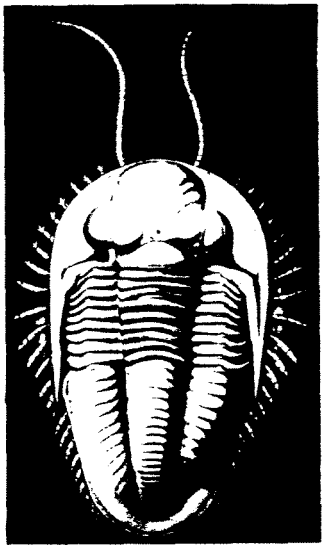
TAXA	Graneros 1	Graneros 2	Greenhorn float	Blue Hill
HYBODONTOIDEA				
Hybodus sp.		C		
Hybodus n. sp.				P
Ptychodus decurrens			P	
Ptychodus anonymus			C	C
Ptychodus whipplei				P
ORECTOLOBIFORMES				
Chiloscyllium greeni		P		P
Cretorectolobus ? sp.		P		
Cantioscyllium decipiens				P
LAMNIFORMES				
Odontaspis n. sp.	P	A		
Jaekelotodus ? n. sp.		P		P
Scapanorhyncus raphiodon				C
Cretodus semiplicatus	C			P
Cretodus crassidens			P	
Cretolamna appendiculata	P			P
Cretoxyrhina mantelli	P		A	
Squalicorax falcatus	C		C	A
CARCHARHINIFORMES				
Scyliorhinus sp.		P		
RHINOBATOIDEA				
Rhinobatus incertus		P		P
Rhinobatus sp. A		P		
Rhinobatus sp. B				P
Protoplatyrhina ? sp.		P		
Pseudohypolophus mcnultyi				P
SCLERORHYNCHOIDEA				
Ischyrhiza sp. A		C		
Ischyrhiza sp. B				C
Sclerorhynchus atavus ?				P
Ptychotrygon n. sp. ?		P		
Ptychotrygon triangularis				C

EDITOR'S NOTE

The faunal list above includes many of the fossil sharks' teeth that have been found at the outcrop described in the roadisde geology trip on Jefferson County, Nebraska, that was published in the March, 1989, "Pick & Shovel." It has been printed here by permission of the author. It should properly be cited as follows: Kirkland, J., 1989. Fossil Elasmobranchs from the mid-Cretaceous (Middle Cenomanian-Middle Turonian) Greenhorn Cyclothem of Eastern Nebraska. Nebraska Academy of Sciences, Proceedings, 99th Annual Meeting.

INVERTEBRATE PALEONTOLOGY IN NEBRASKA

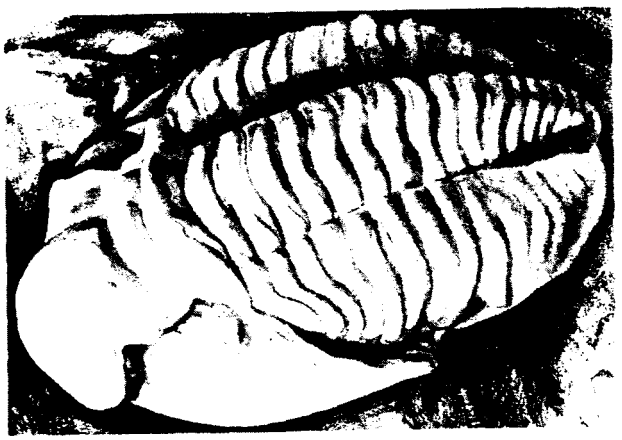
Roger K. Pabian
Conservation and Survey Division,
IANR
University of Nebraska-Lincoln



Ameura, shown in this artist's reconstruction, is the largest trilobite to be found in Nebraska. Maximum length (not including antennae), about three inches.

Nebraska is best known for its' large vertebrate fossils such as the titanothere, mammoth, or plesiosaur. The little animals without backbones, those called invertebrates, too, have their story to tell about the geologic history of our state.

My first contact with invertebrate fossils was in the late 1950's. I had taken a couple of field trips to the old Rock Lake and Cedar Creek quarries near Louisville. At the former site, many Late Pennsylvanian brachiopods, corals, bryozoans, mollusks, and echinoderms were located---at the latter, were many late Pennsylvanian brachiopods and trilobites. The latter discovery led to a National Science Foundation grant under the supervision of Dr. J. A. Fagerstrom. John Boellstorff worked on the brachiopod, Juresania nebrascensis, and I worked on the trilobite, Ameura sangamonensis (Meek & Worthen).



Ditomopyge is the trilobite most commonly found in Nebraska. Maximum length, about one inch.

We did the above work during the summer of 1962, and, at the time, did not realize that we were adding to a rich tradition of invertebrate paleontological research in Nebraska.

For example, the trilobite was subsequently shown to belong to the species Ameura missouriensis (Shumard, 1858). Shumard had named the species 7 years before Meek and Worthen had named theirs in 1865. Neither was Shumard "right" nor Meek and Worthen "wrong." The many specimens that we had collected showed that each of the above species was an end-member in a continuous spectrum. We statistically compared our specimens to original specimens that had been collected about 100 years earlier by Shumard and Meek and Worthen. We had placed one species into "synonymy" with another.

The pioneer invertebrate paleontologists included not only B. F. Shumard, F. B. Meek, and A. H. Worthen, but also F. V. Hayden, J. G. Norwood, G. C. Broadhead, J. H. McChesney, and E. G. Woodruff, to mention but a few.

The early 1900's saw some interesting publications including G. E. Condra's classic study of Pennsylvanian bryozoans. For some reason or another, a "dark age" in invertebrate paleontological research set in, and few papers were published until 1927, when C.O. Dunbar and G.E. Condra published a study on Pennsylvanian fusulinids of Nebraska. This was followed by their brachiopod volume and their work with A.K. Miller on Pennsylvanian nautiloids. A number of shorter papers on micro-fossils followed. Other researchers in this era included M. K. Elias (bryozoans), and G.J. Loetterle (foraminifers). World War II put the clamps on most research that did not aid the war effort.

Several years passed after WW II before a new corps of trained researchers became available. In the late 1940's and early 1950's, invertebrate fossils were studied by many Master's and PhD students but most of their results remain in the library as unpublished theses. During the 1950's and early 1960's, a major change was taking place in paleontological thought. Almost all of the earlier works were strictly descriptive. The job of the paleontologist became not only one of describing, but also one of analyzing and interpreting fossils. They wanted to learn what fossils tell us about ancient environments, climates, poles, continents, etc.?

In the present era, invertebrate paleontologists working in Nebraska come from many universities around the world. Peter von Bitter, Royal Ontario Museum, Toronto is studying conodonts, small tooth-like structures from unknown animals. P.D. Taylor of the British Museum has studied some of Nebraska's fossil bryozoans recently, and Ian Rolfe of Scotland has worked with some of Nebraska's fossil phyllocarids, shrimp-like animals.

Closer to home, Royal Mapes of Ohio University is working on recently-discovered, late Pennsylvanian ammonoids from Richardson County, and Brian Glenister, University of Iowa, is examining some recently found Permian ammonoids from the same area. Philip Heckel of the University of Iowa has worked with conodonts from Nebraska. Scott Ritter at Oklahoma State University is working on conodonts from the Permian Bennett Shale of Nebraska, and Darwin Boardman at Texas Technical University is working on mollusks.

W.D. White of Omaha spent many years collecting crinoids and other excellent examples of invertebrate fossils from Nebraska. He kept excellent, easy-to-read records on all of his specimens. His collection is now housed in the University of Nebraska State Museum's research facility, where much of it is being studied by me, graduate students, and scientists from many places. Many of White's crinoids were used in building a data base for Peter Holterhoff's MS thesis. White recently received the Strimple award from the Paleontological Society, the highest such award for amateur collectors.

The AFMS Scholarship Fund has played its' part in invertebrate paleontological research here. Three scholarship recipients have completed MS theses recently. Stacia Spaulding worked on microfossils from the Late Pennsylvanian Lecompton Formation in Cass County; Donald Shields worked on the paleoecology of the Pillsbury Shale through Dry Shale interval in Otoe and Richardson County, and Linda Rankis worked on thermal color alteration of conodonts from the Oread Formation in Cass County.

Above are some of the highlights of invertebrate paleontological research at UN-L. Currently, three faculty members and about 10 graduate students are carrying on the tradition. Workers from other states and countries could probably triple the above number of researchers in Nebraska. New finds are showing a great deal about Pennsylvanian-Permian glaciation and great fluctuations in sea level. Ancient environments have been reconstructed. The future looks good.

The above article article was originally written for the "G. I. Nugget," official publication of the Grand Island Earth Science Society, Grand Island, Nebraska, vol. 15, no. 7, October, 1988, pp. 94-95.

Roadside Geology of Nebraska

Part 2 of a series

Table Rock Area, Pawnee County

By Don Phillips

This trip takes us into north-eastern Pawnee County to see rocks that were deposited about 290 million years ago. These rocks are, from oldest to youngest, the Scranton, Burlingame, and Wakarusa Formations that are part of the Wabaunsee Group of the Late Pennsylvanian Virgil Series (Fig. 1) of the late Paleozoic Era.

To find the outcrop area, go east from the junctions of Nebraska State Highways 4 and 65. As you approach the overpass, take a right turn and cross the tracks. You will see an abandoned hotel. Go southeastward for about 2 miles on the road that is about parallel to the tracks. The outcrop will be behind a large hill, to your right. It is at the first junction with another county road. Turn right an park a short way up the hill---the crop is on your right. See figure 2.

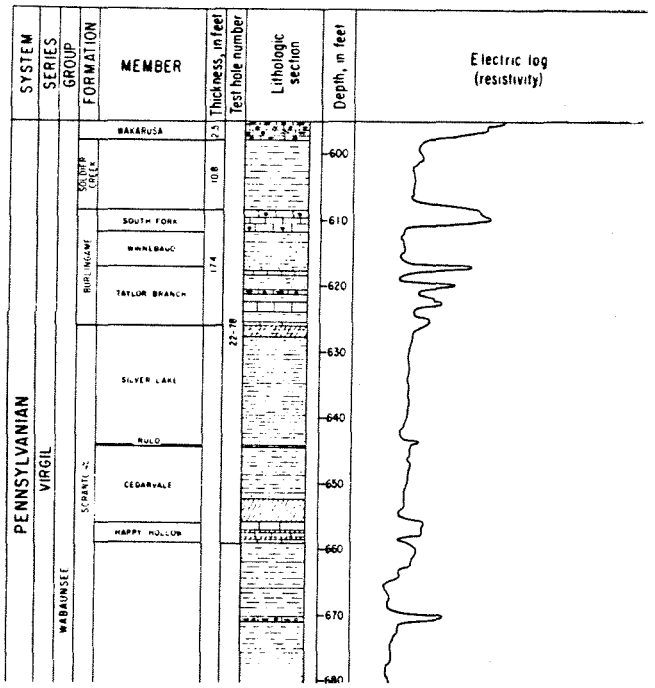


Figure 1. Composite stratigraphic section of rocks exposed about 2 miles southeast of Table Rock, Pawnee County. From Burchett, R. R., and J. L. Arrigo, 1978. Structure of the Tarkio Limestone along the Humboldt Fault Zone in Southeastern Nebraska. Nebraska Geol. Surv., Rept. Investigationbs 4. Conservation and Survey Division, IANR, University of Nebraska-Lincoln. 112 pp.

A few rare plant fossils have been found in the Silver Lake Shale Member of the Scranton Formation. Marine invertebrate fossils are common in the Soldier Creek Shale.

Most of the lower 3/4 of this expoosure contains very few fossils, with the exception of the thin Rulo Limestone Member of the Scranton Formation and a very thin bed of black shale in the Cedarvale Shale Member. The former bed contains some brachiopods and crinoid stems, and the latter, numerous ostracods. You may find some material that has been displaced and washed down from higher areas anywhere on the hill.

The Wakarusa Limestone, that is near the top of the exposure (Fig. 1), too, is nearly devoid of fossils. The upper bed of the Soldier Creek Shale, however, produces a very diverse marine fauna, including: corals, bryozoans, brachiopods, gastropods, nautiloids, crinoid cups and plates, echinoid plates and spines, an ocassional trilobite, and a few shark teeth. See figure 3. You will likely not have any difficulties in filling your sample bags with many of the above materials.

I recommend taking a little time to study the geology of this area prior to taking a trip there. You will discover that there are many more sites that produce fossils and other outcrops that can be studied and explored. In addition to to fossils, many outcrops of glacial till in this area have produced Lake Superior Agates.

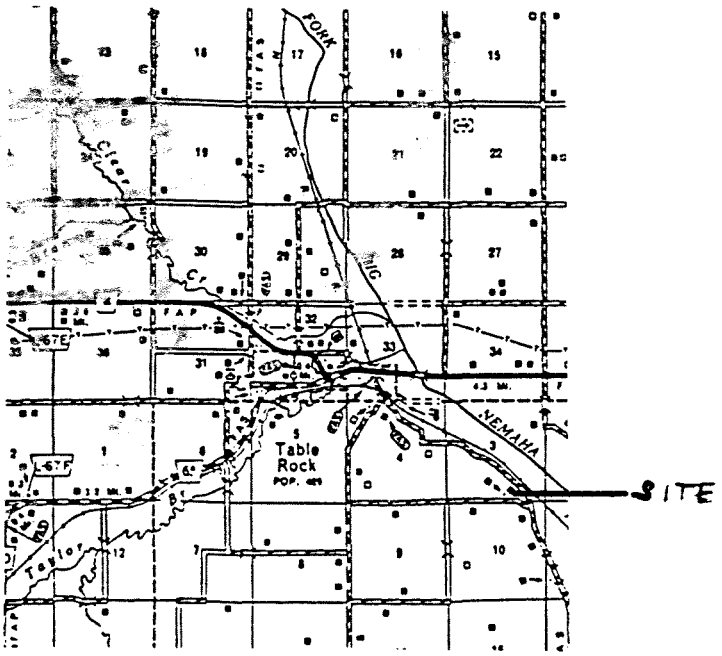


Figure 2. Map showing location of outcrops of late Pennsylvanian rocks southeast of Table Rock, Pawnee County. Base Map: Nebraska Department of Roads, County Highway Maps. 1/2 in./mile.

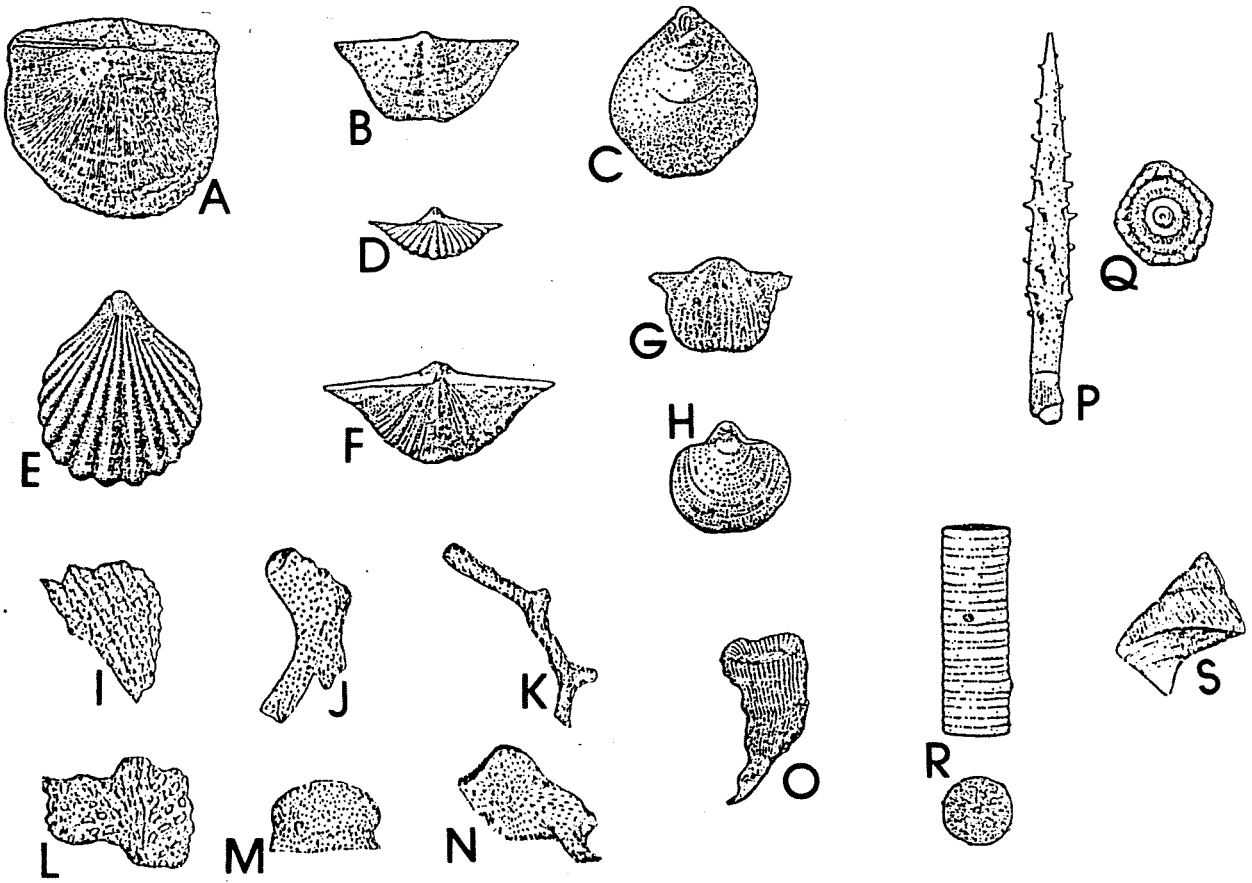


Figure 3. Fossils from Soldier Creek Shale. A-H, BRACHIOPODS. A. *Derbyia*, X1. B. *Neochonetes*, X1. C. *Composita*, X 1/2. D. *Punctospirifer*, X1. E. Hustedia, X2. F. Neospirifer, X1/3. G. Hystriculina, X1. H. Phricodothyris, X1. I-N. BRYOZOANS. I. *Fenestella*, X1. J. *Cyclotrypa*, X1. K. *Rhombopora*, X1. L. *Septopora*, X1. M. *Fistulipora*. N. *Stenopora*, X1. O. CORAL, *Lphopphyllidium*, X1. P, Q. ECHINOIDS. *Archeocidaris* sp. P. Spine, X1. Q. Interambulacral plate, X1. R. Crinoid columnals, X1. S. Gastropod, *Phymatopleura*, X1. Above illustrations from: Fabian, R. K., 1970. Record in Rock, a handbook of the invertebrate fossils of Nebraska. Conservation and Survey Division, University of Nebraska, Educational Circular 1. 99pp.

TO MY FELLOW CLUB MEMBERS:

The 1989 Show Committee and especially myself would like to thank you for all of the wonderful help before and during our 31st Annual Show. Your displays were many and very great. The weather was very cooperative and we had a great show.

I would like to take this time to thank all of our committee heads for the time and effort that was put forth so the Show would be a huge success. We hope that the 1990 Show will be bigger and better than ever. This year we had over 140 displays and next year, let's go for 200 displays.

Once again, THANK YOU to all of our wonderful club.

John Harrison
1989 Show Chairperson

TOUGH ACT
TO FOLLOW

MIDWEST FEDERATION OF MINERALOGICAL AND GEOLOGICAL SOCIETIES

Member of The American Federation of Mineralogical Societies

NEWSLETTER

Published monthly Except June, July, August | MARCH 1989 - Issue 286 | Judith Washburn, Ed. 107 Deer Creek Road Rochester, IL 62563

March 1989

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SPRING EXECUTIVE MEETING

The Spring Executive Meeting of the MWF will be held on April 8th in Carterville, Illinois at the Methodist Church. The Southern Illinois Earth Science Club will be having their Annual Gem and Mineral Show next door in the Carterville Grade School Gym. Complete details will be sent to the committees and officers by Secretary, Jean Reynolds.

We are really looking forward to hosting the Spring Meeting in conjunction with our annual show. For a small scattered club membership, we have a great little show. Most of our members participate in the entire show in many ways. Our two day show has hourly door prizes, many club exhibits, working demonstrations, silent auctions, fluorescent light shows, dealers with a variety of material and delicious food prepared by the Methodist Ladies Auxiliary. Our talented and dedicated members demonstrate most facets of the hobby and members stay with their exhibits to discuss them with the public. We'll be sporting green club vests and big friendly southern Illinois smiles.

The packets Jean will be sending will have information about motels, restaurants, etc. Watch for them.

-Joe Claxton
Assistant Illinois State Director

GOOD NEWS - FROM AFMS ENDOWMENT FUND - GOOD NEWS

Your AFMS Endowment Fund Committee has, at long last, an outlet for cancelled stamps! Mr. Penton, from Rocky Mountain Federation, informed us he can sell all the stamps we send him. The money realized will go to the AFMS Endowment Fund.

If your club would like to help, just save your used stamps, commemorative or others, trimmed or untrimmed. Send stamps to:

Leroy and Irene Penton
874 S. Belmont Drive
Lafayette, CO 80026

We will have a few of the AFMS caps, mineral charts and fossil charts at the MWF Spring Meeting in Carterville.

Jack Dare, AFMS Committee

President	First Vice President	Second Vice President	Secretary	Treasurer
Dr. Benjamin Moulton	Mr. Glen A. Henning	Mrs. Margaret Nelson	Miss Jean Reynolds	Mrs. Kitty Starbuck
R.R. #21, Box 103	Rte. 1	Rt. 3, Box 370E	107 Tuttle Ave.	7436 W Avenue East
Avra Woods, IA 47802	Huntsville, IL 62344	New Carlisle, IN 46552	Clarendon Hills, IL 60514	Vicksburg, MI 49097
812-234-3870	217-667-2285	219-654-3673	312-323-1682	616-649-1991

Editor's Note

It's almost SPRING! Time to shake those winter "blahs" and get ready for another season of down-to-earth, out-in-the-field rockhounding. If you're starting to worry where you're going to put all of those waiting-to-be-found treasures, maybe it's time to do some pre-spring cleaning. Go through last year's "finds" and make four separate piles:

Pile #1 - The Keepers - the ones you can't live without. Limit yourself to two of each.

Pile #2 - The Traders - the ones from Pile #1 that you would have kept if you hadn't resolved to keep no more than two.

Pile #3 - The Donees - half of what you put in Pile # 2. You don't have room to keep all that stuff! Take some to your local show and bring the rest to the Federation Show in Kalamazoo for the auction.

Pile #4 - The Garden Delights - the ones you never should have brought home in the first place! Dump them in that pile behind the fence or border the garden with them.

Editors - you need to do some spring cleaning, too. Take all of those exchange bulletins, go through and clip the articles you want to save for reference and pitch the rest. Make room for all the good stuff that's going to come your way this year. Bring all of the extra copies of your own bulletin that you've saved to the Editor's Table in Kalamazoo. Pick up a couple bulletins that you haven't seen before. There could be a new idea waiting to be discovered.

Tip for Editors - from 3M Rockhound News
3M Prospectors Club
St. Paul, MN

Editor Aleene Mistrot uses a little trick to attract member attention in her bulletin. Everything is very neatly typed and placed in straight, prim columns - but then, in bold, handwritten script, an announcement or header will pop up! It intrudes into the calm and really grabs attention. Keep those members on their toes, Aleene.

Program News-

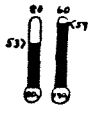
CAROUSEL FUND

There has been no change since our last report. The chart shows our progress toward our initial goal. When that is reached we will need another half dozen or more 140 size Carousels for New Programs. (There will be enough of the 80 size as we retire older Programs but very few if any 80+ slide Programs will be retired in the near future.)

At least 75% of our orders specify Kodak -- so we are sure that most of you appreciate not having to transfer the slides from one tray to another! Please help us to complete this project. Then the Donors names will be published. (Each Carousel has a label with the Donor's name.)

Mail donations (check made out to MWF or Carousel[s]) to: Program Library c/o
Margr Collins, 3490 S. Hannan, Canton, MI 48188.

On the positive side. The new "PROGRAM PLANNER'S MANUAL" will be mailed in April. Each Club will receive a copy for their Program Chairperson/ Committee. State Directors and their Assistants will also receive a copy. Additional copies will be available from the Director of Supplies.



CALUMET NATIONAL HISTORICAL PARK PROPOSED

Have you ever collected native copper, half-breeds (copper/silver), prehnite with copper flecks, Mohawkite, and other minerals around Calumet in the Keweenaw Peninsula, Michigan? The new 101st Congress will take up the issue of making that area a National Historic Park. No collecting is permitted in the National Park System. Many rockhounds have spent their vacations, long weekends, and field trips looking for those treasured specimens in that area in the past. Will we lose it?

-John Boland
Conservation/Legislation Committee

Goals are dreams with deadlines.
-Diana Scharf Hunt

H.E.L.P.

HELP ELIMINATE LITTER PLEASE!

MAIL ALL EXCHANGE BULLETINS TO:

Lincoln Gem & Mineral Club
BOX 5342
Lincoln, Nebraska 68505-0342

Edward Ridge
2507 A st.
Lincoln NE 68502