PICK & SHOVEL

Look inside for...Show News

Crinoid Tales

...and more

Volume---Number 6
February, 1992

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

1992 ELECTED OFFICERS

President: **C. David Heffelbower,** 1819 Washington St., Lincoln, NE 68502 475-4713
1st Vice President: **Charles Wooldridge,** 836 S. 31st St., Lincoln, NE 68510 475-9034
2nd Vice President: **Francis Belohlavy,** 1919 "K" St., No. 4, Lincoln, NE 68510 477-4337
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: **Pam Killion**
Board Member: **Kevin Schwartman,** 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: Dwight Miller

2 Years: Gerald Moore, Don Phillips
1 Year: James Null, Michael Smith

LONG RANGE PLANNING AND BY-LAWS COMMITTEE

3 Years: Fred Holbert
Roger Pabian
2 Years: Kevin Schwartman
Jim Marburger
1 Year: Bob Wright
Linda Parks-Lundgren

STANDING COMMITTEES

Membership: Shirley Rockel
Education: Roger Pabian
Field Trips: Kevin Schwartman
Historian: John & Lillie Lewis
Hospitality: Eddie "Lightning" Ridge
Study Group Coordinator: Ralph Ulrich
Housing/Property: Jim Parks
Junior Activities: Pam Killion
Librarian: Jim Parks/Charles Wooldridge
"Gem Pallette" Corresdpondent: Pam Killion
"Geology Day" Coordinator: Francis Belohlavy

Programs: Charles Wooldridge
MWF Liaison: Vera Lyman

Scholarship: Dwight Miller
Christmas Party: Billie Heffelbower
1990 Rockhound/Year: Charles Wooldridge
1992 Show: Phyllis Parks
1993 Show:
1992 Swap: Roger Pabian
1993 Swap:

AUDITING COMMITTEE, 1987-1988

David Heffelbower
Francis Belohlavy
Shirley Rockel

YOUR PICK & SHOVEL STAFF

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

CALENDAR OF EVENTS

FEBRUARY MEETING: Saturday, February 22, 7:30 PM
Nebraska Center for Continuning Education
33rd and Holdrege Streets.

PROGRAM **Basic Faceting** by Ralph Ulrich.
Bring your curiosity and questions.
We have a very good chance to learn.

JUNIOR MEETING: 7:00 P.M. **Fossil leaf and insect collecting** from Florissant, CO, samples furnished by Pam Killion. Bring needed tools: X-acto knife of similar kind; magnifying glass; wrapping paper and pencils and paper for label writing.

COMING EVENTS: GEOLOGY DAY, Sunday, February 16, 1992, Prairie Interpretive Center, Pioneers Park. 1:00 - 4:00. Set-up begins at noon.

SHOW, March 13-15, 1992, Greater Kansas City Annual Show, Trade Mart.

SHOW, March 21, 22, Lincoln, Nebraska, Pershing Auditorium. LG&MC 34th Annual Show.

SHOW, April 24-26, Wichita, Kansas, Rocky Mountain Federation Show.

REGIONAL SHOWS:

FUTURE MEETING DATES, PLACES: REGULAR MEETING, March 28, 1992, Scottsbluff Room, NCCE, 33rd & Holdrege, 7:30 PM.

REGULAR MEETING: April 25, 1992. NCCE, 33rd & Holdrege Sts., 7:30 PM.

DISPLAY MATERIALS Let's celebrate George Washington's birthday by bringing red, white, and/or blue gems, or gems, minerals, and fossils from the United States, the world's most exotic locality.

PRESIDENT'S MESSAGE

By David Heffelbower

Once again the shortest month of the year is upon us. Those of you who were able to attend had the best January swap we have ever had. Thanks to Roger Pabian, Jim and Phyllis Parks who worked very hard on this swap; and to all of the club members and others who participated in an outstanding event.

Our next challenge, now, is to put on the annual spring show; this time our thirty-fourth. It has been our club's reputation to have a nicer show each year than the year before. This year will be no exception, and I have every confidence that our members will support the show committee in every way necessary.

Our other challenge is membership. We will once again be seeing fewer of our old faithful friends. We must get new members and pass on to them our knowledge and skills. I will ask each of you to invite your friends to participate in our club. Help to make it a source of pleasure in their lives as it is in yours. We are going to have fun in this club! Fun cutting, collecting, trading, designing, traveling and every way that we can obtain pleasure from this hobby. And we will be teaching eachother of ways to increase our enjoyment.

It is important to remember that we are not all experts; even in our own areas of expertise. Our club is not composed of scientists or jewelers but is peopled by individuals who are interested in the mineral world and enjoy the scientific and hobby aspects of geology, mineralogy, gemology, lapidary, jewelry, collecting, and every facet of these activities. In other words anyone who has an interest in any of these activities is a potential member and should have the opportunity to join: so go get 'em.

I look forward to helping you achieve what you want to achieve and enjoy doing it. +++

REFERENCE MATERIALS AVAILABLE

Bob Fixter of Sartor-Hamann Jewelers and a LG&MC member is making available a wealth of reference materials that should be of interest to club members. These include books, videos, movies, slides, crystals, and sample gemstones. Some material will require a deposit that will be refunded upon its return. This source should be of especial interest to club members who are planning programs or for those who are curious about some aspect of gems. To check out items, call Bob Fixter at 476-8561 to make arrangements to pick them up at Sartor-Hamann's downtown store at 12th & "O" Streets. Listings of materials will follow in subsequent issues of Pick & Shovel.

Thanks, Bob!!! Wooly

GEOLOGY DAY

Don't forget Geology Day at the Prairie Interpretive Center at Pioneer's Park on Sunday, February 16, 1992, from 1:00 P.M. to 4:00 P.M. Francis Belohlavy is co-ordinating it this year. For it to be successful, we will need your displays, demonstrations, and participation. It is a very fun event, very low key, with a chance to visit with many fine folks. Ed.

MWF BULLETIN CONTESTS

The Pick & Shovel was entered in the 1991 AFMS/MWF bulletin contest and entries have been received by Coleen Kugler, Bulletin Editor's Assistance Chair. The October and February, 1991, issues were submitted, the former being the mandatory issue.

In addition to the bulletin, articles by Emily Rieur, David Heffelbower, Charles Wooldridge, Ed Pedersen, Don Phillips, Bill White and Roger Pabian were entered. +++

JANUARY SWAP MEET

By Emily Rieur

Many people came with lots of rocks to sell and trade at the rock swap. My favorite was a giant Nebraska blue agate. The owner told me he would sell it to me for $500.00! Some people gave away rocks and fossils. Agates could be bought for only ten cents! Swappers sometimes gave you a bonus when you bought. The adults were nice about answering questions and explaining things. Only my mom told me to be quiet. The silent auction was a good place to get good buys if no one overbid you! I didn't get a blue tiger eye that I wanted but I did get a cave-in-cave. Jan Wright took kids that were interested to view UNL's Geology department. We saw a special computer she uses that can communicate with many different places. We also saw a micro probe. Mohammed Ghazi, a scientist, told us about it. This machine has a high energy arc that heats up rock solutions. They get so soft that they turn into a plasma. Then the atoms that are in the rock can be counted. A computer also helped with this to make sure it was figured out right.

I can't wait for the Gem and Mineral Show, March 21st-22nd, so I can hunt for gems, fossils, and bargains. +++

SHOW CONTESTS

During LG&MC's 34th annual show in March there will be a contest for Nebraska materials in three categories: lapidary art, mineral specimen, and fossil specimen. Prizes will be awarded in each category. In an effort to increase entries, the prizes will be especially nice and will be on display at the February general meeting. I encourage everyone to enter in one or more categories.

Contest is open to both members and non-members. Cases will be available at the show. Judging will occur at 4:00 P.M. Saturday, March 21, and entries can be removed from cases when they are opened at 4:00 P.M. Sunday, March 22. I will be responsible for accepting entries at the show and placing them in the cases. I will be demonstrating in the open shop area. Winners will be announced at the Saturday evening post-show activities.

If you have any questions or concerns, or would like to be a judge, or know people willing to serve as judges, please call me at 475-9034. Thank you! Wooly +++

WELCOME, NEW MEMBER

James Woita,
6112 Seward Ave., #2
Lincoln, NE 68507
(402) 466-1968

Mr. Woita was elected to membership at the February Board of Directors Meeting. His membership becomes official upon his attending a general meeting of the club. Welcome. +++

SHOWTIME! IS ALMOST HERE!

MARCH 21 and 22, 1992

By now every club member, whether able-bodied or just an enthusiast, should be in a frenzy of excitement as we prepare for the countdown to SHOWTIME '92.

When you receive this issue of your Pick & Shovel you'll have one month to finalize your plans for displays and sharing in the many interesting activities that go to make our show one of the highlights of each year.

SET UP DATE: Friday, March 20 th

TIME: From 9:00 AM on -- tables go up first followed by skirting, signs, and cases which must be set up. We need lots of workers!!!

Your Show Committee, consisting of the hardworking people announced in prior Pick & Shovels, have accomplished many phases of the planning and now comes the fun of putting the plans into action. If you have been missing out on the planning and are ready to get involved please contact your show chairman or one of your club officers and put yourself in the action. Don't miss out on the fun!

All of our Dealers have been contracted and are preparing their many wonderful assortment of materials, findings, finished jewelry and specimen to augment your collections.They are many of the same dealers that have been with us previously including Irl and Lois Everett who have decided to brave the elements and come home from Texas early so they can enjoy a last wonderful show among the members and friends of Lincoln Gem & Mineral Club-which Irl brought into existance 37 years ago on January 15, 1955.

Roger has publicised our show all over the area and has media promotions and advertising in place.

Fred has several talented craftsmen ready to share their lapidary skills with the attendees. Charles has Fossil Dig, Gem Hunting and a special Nebraska materials competition planned and waiting. Ed will have lots of prizes for the Rock Races. Kevin is getting some super Demonstrators lined up for your pleasure. Norm has contacted several special features such as Ashfall State Park, Linda Plock's cases of Nomad Jewelry,and some others which are not yet confirmed.

A Saturday Night Supper is being planned as soon as the show closes and all of our Dealers and Friends are invited. This is always a fun time and any of you who have been missing it should try it. Get your reservations in to Shirley Rockel as soon as possible and no later than March 10th.

David has many Guest Lecturers scheduled to keep the program room humming. This includes our favorite '3-D Lecturer, Mr. Walter Erbach.

Our January club meeting had only 30 members in attendance so many of you will need to contact the Show Committee with your space needs and/or the times you will be ready to assist us on Friday, Saturday or Sunday. Anyone who has not given us their reports by February 22 should attend that meeting and enjoy the Scholarship Grant Awards and the excellant program and get your name down on the various sign up sheets. The list of those already signed up looks very impressive and makes me feel as if this will be a big success.

If you don't have a case to display in consider an open display. It is always a welcome addition and adds to the general effect. Perhaps some members have extra cases available and would like to share with newcomers that have not yet acquired them. Let us hear from you.

??IS YOUR CASE READY??
Don't forget to contact us about the case you are going to put in our show.

We'll need a few additional able bodies on Friday morning as at least one of our regulars has had a heart problem and been hospitalized - send cards to Paul Brauch..

If the enthusiasm and attendance is as good as our January Swap we will have a terrific Show to add to our collection of Memories. Now **CLUB MEMBERS** get your minds and bodies ready and let your Committee hear from you. Don't miss out on a single thing! **WE NEED YOU AND OUR CLUB NEEDS YOU.**

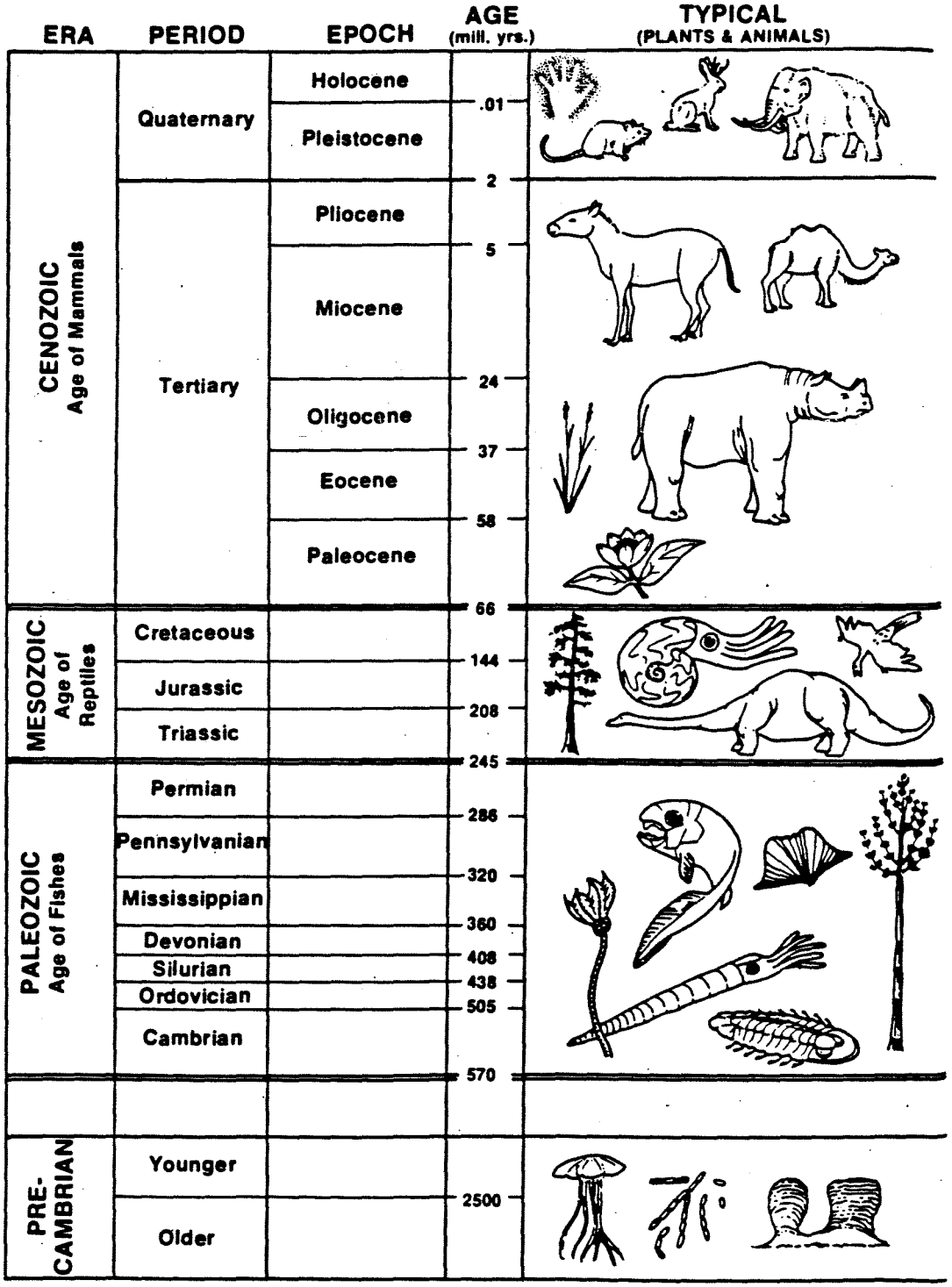
This is your Show Chairman speaking. Phyllis Parks

WORDS OF GOOD CHEER

Grace Carson and Jayne Ten Hulzen had recent stays in the hospital. Both are now released and we with them speedy recoveries. +++

NOTE THE JACKELOPE

John Abel provided me with a guide book for the Energy Minerals Field Institute Field Trip sponsored by the Colorado School of Mines, July, 1990. The geologic time column used there is shown below. Note the "jackelope" in the holocene typical (plants & animals). +++



CRINOID TALES

By Roger K. Pabian

When I was a lowly undergraduate and still a mathematics major I took my first course in invertebrate paleontology and remember the instructor telling the class that fossil crinoids were extreemely rare and that a paleontologist would be lucky to ever find a crinoid cup, let alone a crown. Two important things came out of that particular semester. First was "Pabian's Law" which states that the final grade in a mathematics course is inversely proportional to the course number. Secondly, I found several crinoid cups and a crown. These fossils were eventually described in a 1974 paper that I did with Harrell L. Strimple.

Harrell was one of the few paleontologists to succeed without the benefits of a bachelor's degree, let alone the advanced degrees that the field usually requires. Harrell always remained close to the amateurs and I think he always considered himself to be one. Harrell eventually married Christina Cleburn, a very well-known amateur crinoid collector. An old paleontologist's story goes that Harrell married Christina for her crinoids. Harrell claimed that the real truth was that Christina married him to get her crinoids back. Harrell's best known work is probably on the crinoids from the LaSalle Formation in central Illinois, a paper he co-authored with Raymond C. Moore, University of Kansas. Moore was a very powerful figure in geology and paleontology and it is interesting to note that the only times Moore was ever a junior author on a paper was when he wrote with Strimple.

Over the years I had an opportunity to do some field work with Harrell in southeastern Kansas and northeastern Oklahoma, the area in which he did his initial research and gained some degree of fame. Harrell showed me quite a few outcrops of crinoid bearing strata in these areas and showed me techniques for recovering specimens from their matrix. To examine the surfaces of some of these exposures would never lead you to believe a crinoid was ever there. I have had several opportunities to work with graduate students pursuing advanced degrees and I always take them back to these places to show them what Harrell showed me. The work that has subsequently been done in Oklahoma, Kansas, and Nebraska, has far outpaced our wildest expectations on what we would ever learn about crinoids.

Let us digress, for a moment, and talk about a concept in geology called cyclic sedimentation. Cyclic sedimentation dictates that sedimentary rocks have been deposited in repetetive and rhythmic sequences. Bob Diffendal and I explained the history and concepts of cyclic sedimentation in our Richardson-Pawnee County circular and you are referred there for the details. One is in the club's library. The cyclic sedimentation or cyclothem concept has been best carried out in the midcontinent in recent years by T. Mylan Stout at Nebraska and Philip H. Heckel at the University of Iowa. Although both workers agree that cyclothems are caused by glacial advances and retreats, they differ on when the black shales were deposited, or when was sea level at its maximum and minimum. Currently, Heckel's ideas hold sway and his model purports that black shales were deposited at maximum sea level stand, or in the deepest water.

In March of 1985 I had published with Harrell a paper dealing with crinoids from the Stull Shale (Late Pennsylvanian) in Nebraska and Kansas. Paleoecology became an important part of this study and we defined two kinds of crinoid assemblages: deep, cold water assemblages comprised of small, thin-plated, inornate crinoids; and warm, shallow water assemblages, comprised of large, thick plated, ornamented crinoids.

The following fall I accepted under my tutelage a graduate student from Ohio University named Pete Holterhoff. Pete embarked upon a thesis project to test the ideas that Harrell and I had put forth the previous spring. We were in for some real surprises. Pete put to his disposal collections that noted amateur collector W. D. "Ted" White of Omaha, and I had made over the years. Pete also revisited all of the localities that Ted, Harrell, and I had collected over the years and added to them considerably. Pete also touched base with some well-known amateur collectors in the Oklahoma area, and, notably, Dan Mosher of Bartlesville Wesleyan College. Pete spent much of the time measuring and describing the stratigraphic sequences that yielded crinoids. Pete had built quite a data base and we had both the computer hardware and software to start analyzing and interpreting the data.

Pete showed that the crinoids in addition to being small, inornate or large, ornate had five different kinds of feeding mechanisms. These feeding mechanisms were associated with the small, inornate/large, ornate forms. The simplest kind of feeding mechanism was in crinoids having non-pinnulate arms, the flexibles and disparid inadunates. They were generally confined to cold, deep water. Next in complexity comes the uniserial, single branched arms like in Apographiocrinus. These also liked cold, deep water. Uniserial, multibranched arms are still more complex feeding mechanisms. Then there are crinoids with biserial, single branched arms and crinoids with biserial, multibranched arms. As it turned out, the crinoids with the more complex food gathering mechanisms preferred warm, shallow water and crinoids with simple food gathering mechanisms preferred cold, deep water. See accompanying figure for the different kinds of arms we find on crinoids.

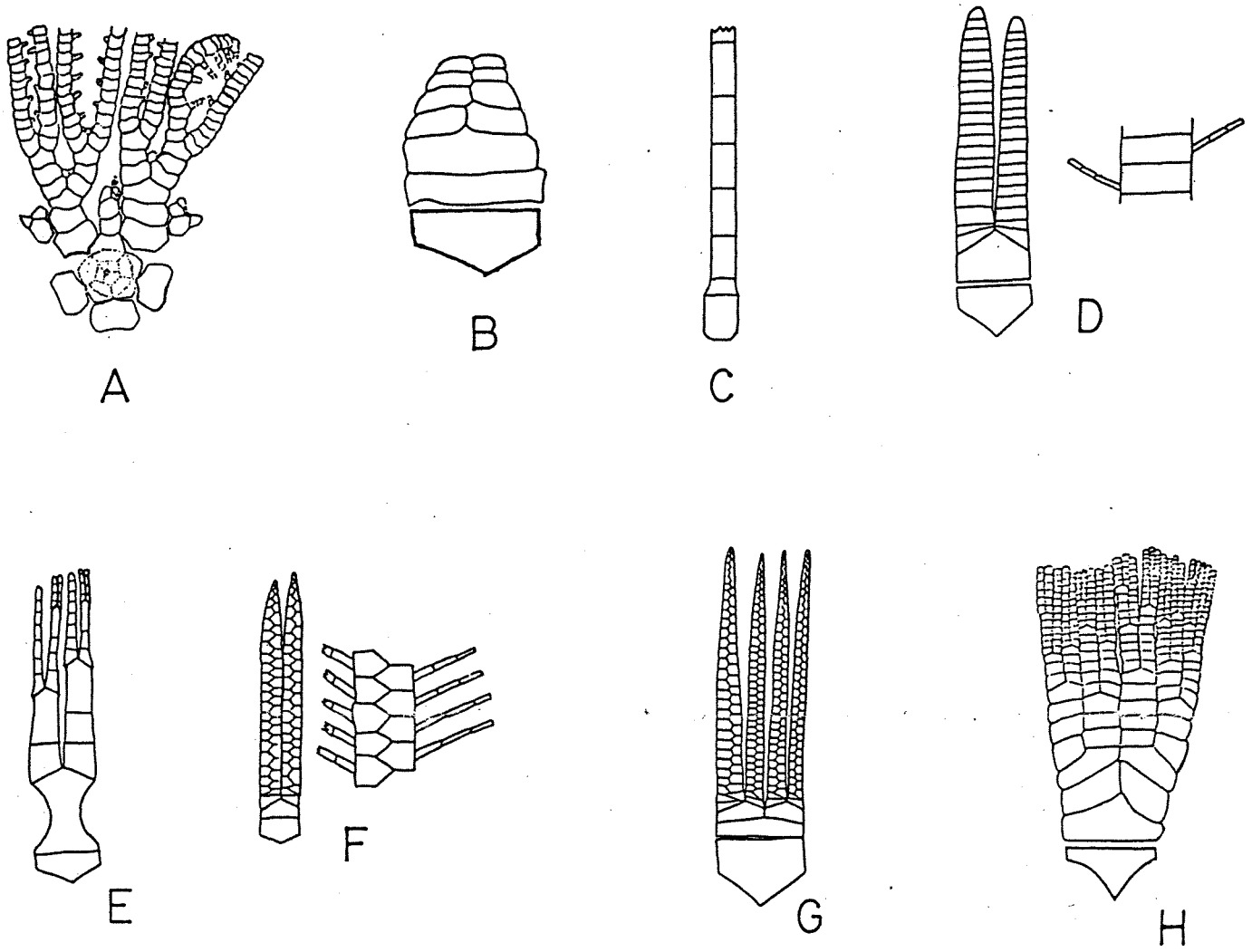
Crinoids are what ecologists refer to as suspension feeders---that is, they feed on food particles that are suspended in the water column. Pete went on to relate the way motile particles are captured in the water column by the way particles in smoke are captured by filters.

Pete went on to study crinoids from the Ervine Creek Limestone of Iowa and Nebraska and in 1991 we presented a poster session at the North Central Section of the Geological Society of America meeting at Toledo, Ohio. The Ervine Creek crinoid distribution fit the model very well. Simple feeding mechanisms were almost always confined to cold, deep water forms, and complex feeding mechanisms were almost always confied to warm, shallow water forms.

Harrell Strimple passed away in 1983 and one of his last requests was that his library not be given to an institution or be broken up but be given to some young crinoid worker who showed great potential and who was on the way up. I recently learned that Harrell's widow, Christina, presented the library to Peter Holterhoff who is now a doctoral candidate at the University of Cincinnati with David Meyers.

Next month: Gradualism or punctuated equilibrium? +++

CRINOID FEEDING MECHANISMS



Schematic arm structures of late Pennsylvanian crinoids from Nebraska, Kansas, and Oklahoma, based on Pete Holterhoff's MS Thesis, Paleobiology and Paleoecology of crinoids from the lower Stanton Formation (Late Pennsylvanian, Missourian) of the Mid-continent United States, University of Nebraska-Lincoln, 137 pp. (A) complex, non-pinnulate arms of Euonychocrinus (from Strimple and Moore, 1971). (B) simple, non-pinnulate arm of Cibolocrinus. (C) non-pinnulate, unbranched arm of Kallimorphocrinus. (D) uniserial, non-branching arm of Apographiocrinus. (E) uniserial, pinnulate arms of Exocrinus. (F) biserial, single branched arm of Delocrinus or Graffhamicrinus. (G) biserial, pinnulate, multi-branching arm of Parulocrinus. (H) pinnulate, multi-branching arm of Sciadiocrinus. Note that the crinoids in the upper row are generally found in the cold, deep water deposits of the cyclothem whereas the crinoids in the lower row are generally

SWAP REPORT

The 1992 swap was probably our best attended and we had more swappers than ever before. Thanks to the people who worked so very hard at it, and especially Jim and Phyllis Parks who really kept the ship afloat by seeing that swapper bucks were quickly redeemed and re-circulated, and who kept the silent auctions running.

During the swap we were also able to pass out about 60 show fliers and to make contact with several potential members who were provided with applications.

On the downer side, there were a couple of thefts reported by swappers. We regret this development but should expect mischief to increase with traffic flow. I will strongly recommend to the 1993 swap director that all swappers should provide covered cases for their materials.

The financial side of the swap was very positive, however. The three afternoon silent auctions yielded $30.60 and the evening sale yielded $31.00 for a total of $64.60 to be given to the AFMS scholarship fund. The surcharge on the swappers dollars netted $114.65 that will go to the general treasury.

Thank also to Shirley Rockel who again organized the pizza supper at Valentino's. It again proved to be a good way to wind down swapping and prime up for an evening meeting which was followed by coffee and cake to celebrate the club's birthday. RKP

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Reprinted from **RESOURCE NEWS**, bimonthly newsletter of Conservation and Survey Division, IANR, University of Nebraska-Lincoln, NE 68588-0517, Volume 1, Number 2, Page 2.

Rock-hounds name Pabian to Hall of Fame

On a field trip near Holmesville one day in 1959, Roger Pabian split open a geode to examine the enclosed crystals.

Those crystals opened up for Pabian a fascination with minerals, gems and fossils that led to a career as a research geologist at the Conservation and Survey Division (CSD) of the University of Nebraska-Lincoln. This career led to a reputation as a gem, mineral and fossil expert and a champion of rock hounds in the region.

For his contributions to earth-science hobbyists, Pabian was inducted this fall into the Rock-Hound Hall of Fame, sponsored by the American Federation of Mineralogical Societies and located in Murdo, S.D.

Pabian has devoted much of his career to producing field guides and other educational material for amateur collectors because he noticed early on the lack of such material available to non-professionals. People get involved in rock collecting because it's fun and because they are curious about the world around them, he added.

"Collecting rocks causes creative juices to flow," he said. "It makes people think about how the world came to look like it does today and how it must have looked in the past. It makes them think about the conditions needed to produce different minerals and gems and it makes people ask why some organisms flourished and some became extinct."

In eastern Nebraska, Pabian said, the best places to look for gems and minerals such as agates, jade, garnet, tourmaline, sapphires and rubies are gravel pits, quarries, road cuts, river gravel bars and plowed fields. Since these areas are usually located on private property, acquire permission from the owner before beginning the hunt, he added.

Throughout the year, gem and mineral shows are held around the state to support hobbyists and provide them with new ideas. These shows are a good place for beginners to learn more about the hobby, Pabian said. The annual show of the Lincoln Gem and Mineral Club is March 21-22 at Pershing Auditorium. Admission is $2. A complete list of field guides, circulars and other publications related to gems, minerals and fossils is available from the Conservation and Survey Division, UNL.

OTHERS WRITE

Reprinted from Osage Hills Gems, Bartlesville, OK, November, 1991.

OSAGE HILLS GEMS NOVEMBER - 1991

FROM A GOOD CAB TO A 'WOW' CAB
by Mel Albright

Some stones that make pretty cabs can be turned into spectacular cabs with a little planning, effort, and extra work. The secret is to form layers of the slab material with something else.

First, let's talk about plume agates. Often, these beautiful agates contain plumes that are really something when you light a slab from behind. But when a cab is made they're rather blah. This occurs because there is no contrast to bring out the plumes. A wonderful solution is to cut the plume slab one half as thick and then make a doublet with a contrasting stone which is also cut half the normal slab thickness. For example, I had some Friday plume agate which made outstanding cabs when backed with either black obsidian or white glass slag. Other agates become outstanding when backed with red jasper. Other colors may work too. We all have great color-no pattern slabs, To test, put water between them and look. If you decide they make a good pair, a careful glueing with water-clear 330 epoxy makes your doublet. Let dry at least 2 full days. Then treat it as any slab - with your templates, hunt for a good cab, mark it and trim it into a cab rough, then grind and polish as usual. The only change you must make is to make the cab somewhat flatter on top with steep curves into the edge. This keeps the bottom stone from showing separately when the cab is mounted.

A second way to enhance some materials into something spectacular is useful on <u>some</u> rocks with clear or nearly clear portions. It involves a technique which has grown to mean shoddy to a lot of people. The trick is glueing aluminum foil on the back of the finished cab. It can be beautiful when used to enhance natural materials instead of the infamous cheapo cabs whose only beauty lies in the foil. As an example of good use, let's consider Montana agate. Some Montana agate has within the clear to transluscent portions a beautiful golden color which you cannot see until you view the cab with aluminum foil behind. Then a beautiful glowing gold-yellow appears. To use foil, you hunt for a pretty pattern within the agate as you normally would. Then make a cab just as normal. Then, using 330 epoxy again, glue the shiney side of the foil to the back of the cab. Let dry at least a day. Then <u>carefully</u> trim the edges and polish off any glue you got on top of the cab. The foil WILL peel off if you're not careful. The colorful array of aluminum foils available for gifts - gold, red, green, blue - can enhance the beauty of other stones just as the doublet in the method above. IF YOU DO THIS, your finding MUST be solid backed because the foil will scratch off if not protected.

Give one or both methods a try. I guarantee you that the right combination will indeed make everyone say "WOW".

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OTHERS WRITE

Reprinted from Osage Hills Gems, Bartlesville, OK, December, 1991.

OSAGE HILLS GEMS **DECEMBER - 1991**

Chatoyancy and Asterism -- Charles A. Stratton

Chatoyancy and asterism are two closely related *phenomena* in certain cabochon-cut gemstones which add considerably to their beauty and give a special effect which is valued by the consumer. Considering that the French spell *cat* with a *ch*, it is easy to see that "chat-oy-ancy" means "cat's eye quality". What is referred to is the slit-like appearance of the cat's eye pupil in bright light. The cat's eye stone, when viewed with a single light source, shows a bright streak of light across its domed top; this streak moves with any motion of stone, light source, or observer. The brighter and narrower the streak, the better the eye is considered to be. *Asterism* is a multiplication of the cat's eye effect in which two or three eyes are crossed to give a star. (I will leave the analogy of two- or three-eyed, cross-eyed cats up to you. Anyway, *aster* is Latin for *star*.)

The principle behind the effects of chatoyancy and asterism can best be visualized by observing a spool of thread by means of a single light source. A streak of light will be observed on top of the threads, running the length of the spool and perpendicular to the threads. The light appears as a streak because the correct angles for reflection occur only at one line of the curved surface. If the threads were all spread out flat, the whole surface would reflect, giving a surface sheen instead of a line. A crystal of quartz can have a set of very fine needle-shaped crystals (silk) as inclusions, with all running the same way perpendicular to the c-axis (long axis). If the end is cut and polished parallel to these, the reflection of light gives a sheen. Now, the curving of that surface into a domed cabochon gives the streak effect first observed on the spool of thread. Refraction of light by the domed surface deflects all beams except the ones which hit at the correct angle. What we have now is a *cat's eye quartz*. Suppose that now, instead of only one set of silk crystals, we have three, all perpendicular to the c-axis, and with one set perpendicular to each of the three a-axes of the hexagonal (or trigonal) crystal. The result is a *star quartz*, an effect sometimes seen in prized specimens of rose quartz.

The silk crystals must be very fine in order to impart good chatoyancy or asterism. In fact, they must be too fine to be clearly seen at 30-power magnification. Probably the most common *silk* is composed of rutile crystals or of voids (negative crystals). Finely-divided needles of other minerals are possible, but apparently they are not very frequent or important. The number of rays possible depends on the crystal form of the gem. Six-rayed stars (three rays crossed) are possible in the hexagonal and trigonal (six-sided) minerals: corundum, quartz, and beryl. Of these, the star rubies and sapphires of corundum are by far the most important. By comparison, quartz and beryl star infrequently and poorly. The best cat's eyes are in chrysoberyl and quartz.

Four-rayed stars (two rays crossed) are possible with gems in the isometric (cubic), orthorhombic, and other systems. Starred almandite garnets and star diopside are common and are occasionally of good quality.

Some of the star and cat's eye material mentioned here are feasable for the amateur to procure and cut. In fact, the cabochon cutter would do well to specialize in some of these. Needless to say, the cutting of the star rubies and sapphires would require the use of diamond saws and laps, from preform to polish.

Read your bulletin to spot new materials or specials of the above advertisers.

<u>Advertising</u> by a rock-bobby business or interest is permitted with the approval of the Board, at a rate now set at $15.00 per full page per insertion, paid in advance.

1/2 page, $7.50; 1/3 Page, $5.00; 1/4 page, $3.75 (Min). These ads will be placed throughout the bulletin as space permits.

Subscriptions to the PICK & SHOVEL ARE $10.00 per year mailed.

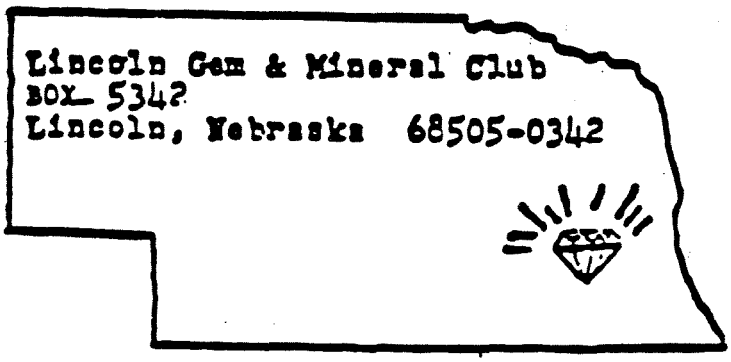
Dues to LINCOLN GEM & MINERAL CLUB are as follows:
Adult membership fee $10.00 (age 16 and over)
Junior membership fee $2.00 (age 12-16)
Family membership fee $22.00 (husband, wife, and all children under 16---permanent residents of household).

New memberships must be approved by the Board, after applicant attends at least one (1) regular meeting of the club, and pays the above dues plus $5.00 registration fee.

H.E.L.P.

HELP ELIMINATE LITTER PLEASE!

MAIL ALL EXCHANGE BULLETINS TO:



Bulk Rate

LINCOLN GEM AND MINERAL CLUB, INC.
P. O. BOX 5342
LINCOLN, NEBRASKA 68505