

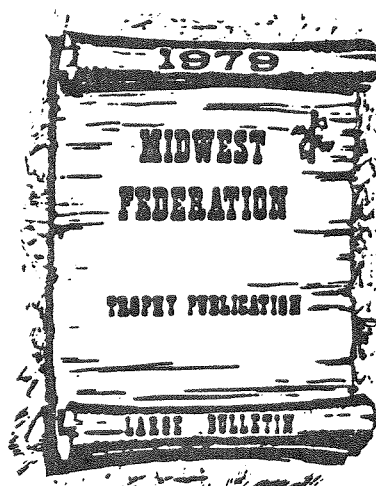
THE PICK & SHOVEL



October 1983

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OFFICIAL PUBLICATION OF

Lincoln Gem and Mineral Club, Inc.

P. O. Box 5342

Lincoln, Nebraska 68505

LINCOLN GEM AND MINERAL CLUB, INC.
P.O. BOX 5342, Lincoln, NE. 68505-0342

The purpose of this corporation shall be to study, promote an interest in, and disseminate knowledge of lapidary and various earth sciences including but not necessarily limited to geology, paleontology, and mineralogy. It shall be a particular purpose of the corporation to provide education in these fields to its members and the general public, particularly youth and student groups.

MEMBER: American Federation of Mineralogical Societies (AFMS)
Midwest Federation of Mineralogical and Geological Societies (MWF)
Nebraska Association of Earth Science Clubs, Inc. (NAOESCI)
Nebraska Academy of Sciences (NAS)
Community Arts Council of Lincoln (CAC)

Regular Meetings: 4th Saturday of the month, September thru May; 7:30 P.M.
At Nebraska Center, 33rd & Holdrege

1983 ELECTED OFFICERS:

President.....	Howard Taylor, Jr.	910 New Hampshire	Lincoln, 68508	476-3707
1st Vice Pres....	Glenn Lyman	420 N. 56th St.	Lincoln, 68504	464-6089
2nd Vice Pres....	Claude Scott	4917 Normal Blvd.	Lincoln, 68506	488-0739
Secretary.....	Gail C. Scott	4917 Normal Blvd.	Lincoln, 68506	488-0739
Treasurer.....	Phyllis Parks	2435 S. 19th St.	Lincoln, 68502	476-6798
Board Member....	John Abel	2829 Van Dorn	Lincoln, 68502	423-7654
Board Member....	Florence Boring	2836 S. 40th St.	Lincoln, 68506	488-6243
Board Member....	Virginia Green	6120 The Knolls	Lincoln, 68512	423-5032
Board Member....	Frank Rule	6333 Kearney	Lincoln, 68507	466-1697

Nominating Committee -- 3 years: Richard Haney, Wilfrid Wittman
2 years: Vera Lyman, Frank Rule
1 year: Marie Taylor, Jim Parks

LONG RANGE PLANNING AND BY LAWS COMMITTEE:

1 year - Jim Parks, Phyllis Parks 3 years - Roger Pabian, John Abel
2 years - Marie Taylor, Vera Lyman

STANDING COMMITTEE CHAIRPEOPLE:

Programs.....	Claude Scott	1984 Show.....	Roger Pabian
Education/Publicity.	Roger Pabian	1983 Show.....	John Abel
Hospitality.....	C. Rose & J. Haney	MWF Liaison.....	Marie Taylor
Historian.....	John & Lillie Lewis	Refreshments/Party...	Marj Heedick
Librarian.....	Jim Parks	Scholarships.....	Marie Taylor
Membership.....	Bob & Mary Walker	Outside Displays.....	
Field Trips/Safety..		Housing/Property.....	Claude Scott
Sunshine Corner....	Susan Taylor	Editor.....	Vera Lyman
NAOESCI Reporter....	Vera Lyman	Junior Activities....	
		'83 Rockhound of Year Chairman....	John Abel
Auditing Committee 1982.....			Ray Lambert, Chairman
			Florence Boring, Vera Lyman

PICK & SHOVEL STAFF:

Editor.....Vera Lyman, 420 North 56th St. Lincoln, NE 68504
Club News.....Helena Baegl
Sunshine.....Susan Taylor

DEADLINE: 1st of Month of Issue. Original articles may be reprinted if credit is given the author and THE PICK & SHOVEL and a copy of the publication is sent to the Editor.



Club Calendar

October							1983
S	M	T	W	T	F	S	
						1	
2	3	4	5	6	7	8	
9	10	11	12	13	14	15	
16	17	18	19	20	21	22	
23	24	25	26	27	28	29	
30	31						

GENERAL MEETING: Saturday October 22, 1983, 7:30 P.M.
Nebraska Center, 33rd & Holdrege
Parking north of Building.

SPECIAL PROGRAM: Minerals in 3-D
Prof. Walter Erbach
Prof. Engineering @ U. of N.

BOARD MEETING: Thursday, November 3, 1983, 7:30 P. M.
Taylor Home. 910 New Hampshire

* * * * *

LOCAL SHOWS: Oct. 29 - 30
Kings East Ballroom
1000 Riverside Blvd.
Norfolk, Nebraska

Oct. 9 - 30th
Neihardt Center
Bancroft, Nebraska

* * * * *

LATE MEMO: Long Range Meeting
Oct 13 7:30
Taylor Home.

GREETINGS FROM THE SUNSHINE CORNER

He finds a scanty shelter
In trees grown gay, but thinned.
He feels the breath of winter
That edges every wind.

But well he knows that somewhere
Eternal summer sings;
The sky is wide for jounies,
And all God's birds have wings.
Clara Aiken Speer



Glad you're feeling better. Cards were sent to
Flossie Litzenberg and to Jim Harrison, NAOESCI president.

Susie Sunshine

You can carry a pack if it's
strapped to your back;
You can carry a weight in your
hands,
You can carry a bundle on top of
your head
As they do in other lands.
A load is light if you carry it
right
Tho' it weighs as much as a
boulder
But a tiny chip is too heavy to
bear
If you carry it on your shoulder.

via OSAGE MILLS GEMS
OCTOBER 1983

FLASH

Florence Boring & Dr. Gilbert Lueninghoener
will be wed in Spring!! Congratulations
He is with Midland College in Fremont

President's Message

Well, another year of activities has started for the Lincoln Gem & Mineral Club as all of you who attended the September meeting well know. Roger Pabian has accepted the responsibility of being Show Chairman for our 1984 Annual Show and Claude Scott has accepted the responsibility of being Swap Chairman for our 1984 Mid-Winter Swap. When you are called and asked to volunteer your time and efforts to work on one or more club events say "YES". It's fun to get involved!

There are several shows that are being held during October, including a month long show at the Neihardt Center in Bancroft, Nebraska. This show is of special interest to our club, because we were asked to participate in it and Florence Boring has been actively involved in the planning of the show. There will be many exhibits from our club and other local collectors as well. I would like to see a large turnout of our club members at all of these shows. Try to attend.

A very interesting program has been scheduled for the October meeting. It is a 3-D slide program on Minerals and it will be presented by Professor Walter Erbach of the University of Nebraska. Plan to be there.

Jim

EDITOR'S CORNER

This is my first time being Editor and I will admit I'm pretty scared.

I would like to thank Vera for all of her hard work as Editor and hopefully continued patience in helping me as Editor.

I would like the cooperation of all the members to be patient with me and offer any assistance possible.

I will try and make 'The Pick & Shovel' as enjoyable as Vera did.

Your New Editor

Judy



IN A NUTSHELL

It was announced our Mid Winter Swap will be held January 28, 1984. Proceeds of swap will go to local scholarship fund. Claude Scott to be Chairman.

Christmas Party was discussed. Planned for December 10th. Plans include catered meal with gift exchange. Final plans will be announced later.

Florence Boring reported on Chet Ager Nature Center.

Roger Pabian presented slide/film presentation of a Fossil project at Saratoga School last year.

Will have election of officers at our November 19th meeting. Notice the meeting has been moved up one week due to the Thanksgiving Holiday.

Next general meeting to be held October 22nd. Please plan to attend. An interesting program is planned.

HINT:

False Ivory--Use beef bones for ivory. Don't cook beef bones. Cleab them off the best you can. Take a large measure of 20 mule team borax and dump it into a pan with enough water to dissolve the borax. Heat to a warm temperature, but do not boil. Put bones in and soak for three weeks or longer. Wash thoroughly, let dry several days in the sun and then you can carve, shape or drill and polish as you would for a cabachon. The material can be worked much easier than stone. Cut round leg bones into squares, drill holes in the sides and you will have links for a bracelet. You don't need expensive tools. Any household tool will do the job. Files can be used to shape the material; even a fingernail file can be used. A hacksaw and pocket knife can be used to carve the stone. Sandpaper can be used to smooth the surfaces and finish with steel wool. With a Dremel tool, you can carve flowers or animals in the material. Soak in strong coffee and you will have "Mastodon" ivory. The carved area turns darker than the rest and stands out beautifully.

LINCOLN GEM & MINERAL CLUB BOARD OF DIRECTORS MEETING Sept. 8, 1983

Meeting called to order by President Jim Taylor, 7:30 P. M.
Sept 8, 1983 at the Taylor home. Five board members, Vera Lyman
and Marie Taylor present.

Minutes of May meeting read. Motion by Claude Scott minutes
be approved as read. Motion approved by voice vote.

Treasurers report read by Phyllis Parks. Treasurers report
approved by voice vote.

Jim Taylor asked that copies of Bd. of Directors minutes & Sec.
report be supplied to each board member as of Oct. 6, 1983 meeting.

Roger Pabian turned over \$50.00, his gratuity for a presentation
at the Kalamazoo show, asking that it go in our local club
scholarship fund. This thoughtful gift was gratefully accepted.

Vera Lyman turned in \$138.00 from sale of pins & patches
at the Spring meeting & Midwest Convention.

Paid bills submitted for approval:

- \$13.46 Page Trophy (Engraving on plaque Best Neb. Specimen)
- \$39.29 U. of N. April P & S printing
- \$30.00 Nebraska Center - April rent
- \$22.89 Vera Lyman - mailing May P & S
- \$30.00 Nebraska Center - May rent
- \$45.24 Jim Taylor, Life Membership & Plaque for J. D. Youngs
- \$34.50 U. of N. 250 copies of P & S (May)

Bills approved by voice vote.

Pre-approved bill in the amount of \$100.00 to Susan J. Taylor
as stipend for Delegate at Kalamazoo MWF show.

Old business:

Jim Taylor reported plans of their family to attend & act as
hosts at the Neihardt Center. Florence Boring not present so
further progress report delayed.

New business:

Vera Lyman has expressed desire to step down as editor of P & S.
Judy McColery presented for appointment as editor. Vera has
graciously offered to assist Judy until she is well versed in
the mechanics of the editing responsibilities. Approval by
voice vote of Jim Taylor's appointment of Judy McColery as editor.
A word of thanks to Vera Lyman for her excellent work on the
P. & S. First place award given P. & S. at MWF reflect the
quality of Vera's work.

7th place award given P. & S. at AFMS Show & Convention.

Discussion of participation in Lincolnfest of Community Arts
Council on Oct. 8 - 9. Final decision delayed. Agreement on
holding Christmas Party.

Mid winter Swap Meet approved - funds to stay in local scholarship
funds.

-continued

Board of Directors, Sept. 8, 1983 - continued

Jim Taylor reported on some early progress in plans for 26th annual show.

March 31 - April 1 set for the '84 show. Roger Pabian consented to be Show Chairman.

Scholarship Chairman, Marie Taylor reported Lincoln Club has fulfilled requirements for 1800% Seal, 1900% Seal and 2000% plaque with a \$12.00 credit, as informed by American Federation Scholarship Foundation.

General Meeting will be Sept. 24, 1983 at 7:30 P. M. at the Nebr. Center.

Next Bd. Meeting Oct. 6, 1983 7:30 P. M. Taylor home.

Motion meeting be adjourned. Motion approved. Meeting adjourned.

Respectfully submitted - C. C. Scott, Sec.

NOMINATING COMMITTEE REPORT:

The Nominating Committee met at the Taylor home on Monday evening, September 19, 1983, at 7:30 P.M.

The following committee members were present. Chairman, Roger Pabian; Marie Taylor, Jim Parks, Frank Rule and Vera Lyman.

The committee is presenting the following slate of nominees for 1984 office which will be elected at our November meeting.

PRESIDENT - Jim Taylor

1st VICE PRESIDENT - Claude Scott

2nd VICE PRESIDENT - James Null

SECRETARY - Vera Lyman

TREASURER - Phyllis Parks

BOARD OF DIRECTORS - (Need to elect 4)

Ron McColery
Jim Stewart
Paul Brauch
Janet Wright
Marie Taylor
Linda Parks
Bob Walker
Mary Walker
Frank Rule

Respectfully submitted,

Roger Pabian, Chairman

* * * * *

safety

Protect your eyes when chipping or grinding rocks. WEAR PROTECTIVE GLASSES.

Keep all belts and pulleys covered. It may save a finger.

Do not overload electrical outlets. If in doubt, have circuits checked by an electrician.

Keep switches and motors in a dry place where water from the grinding wheel will not splash on them.

Keep all containers properly labeled. Putting polishing powders in baking powder cans, for instance, without a proper label, can be dangerous.

ROCKWOOD ROCKHOUND NEWS
SEPTEMBER 1983

AILMENTS PECULIAR TO THE HOBBYIST IN THE EARTH SCIENCES & RELATED FIELD

The following is a partial list of ailments peculiar to the rockhound and earth science hobbyist. Thanks to Peggy and Sam Patterson of the Clear Lake Gem & Mineral Society of Clear Lake, Texas.

CABOCHON CONVULSIONS: Fits commonly associated with grinding of fingertips and knuckles.

CRYSTAL CLEANER'S DROPSY: Excessive retention of fluid, not within the tissues, but on the surfaces thereof. Broken crystals are a common side effect.

FACETER'S FEVER: An uncommon brightness of the eyes, characterized by symmetrical refraction of the light emitting therefrom/

LAPIDARY LAMENT (also known as Post-Polishum Depression): Condition brought on by the discovery of a heretofore unseen fracture after the cab is completed.

STONE TUMBLER'S TINNITUS: A ringing of the ears, curable only by permanent removal of the tumbler (tumblerectomy, tumblectomy?).

That brings us to the most common ailment of all, one that is rapidly becoming epidemic:

HOBBY POCKET: A deep seated emptiness brought on by over-exposure to rock shops, supply catalogues, and gem and mineral shows.

via Carolina Gems, et al
ROCKWOOD ROCKHOUND NEWS
September 1983

FACTS NOT WELL KNOWN

Avalanches have been timed as speeds up to 280 miles an hour reports Nat. Geo. World.

Gwemany's oldest college, the University of Heidelberg, was founded in 1386.

Originally, facial tissues were to be used as filters for gas masks during WW I.

The first wristwatch of which there is any record dates from 1790, and is itemized in the accounts of the Swiss watchmakers Jaquet-Droz and Leschot of Geneva as "A watch to be fixed on a bracelet."

via THE PICK & DOP STICK, et al
ROCKWOOD ROCKHOUND NEWS
September 1983

ICE AGES - When, Where and Why

When did the last ice age occur?

When may there be another?

What causes ice ages? What can we do about them? There has not been one since civilization. There is no easy answer to these questions, but scientists are using modern skills, techniques and their accumulated knowledge to find solutions to them. The last question's answer is-"not very much!"

Being no ice age expert I cannot understand all of the facts relating to past and future glacial activities. I am just an interested layman rockhound. My observations have been limited to local features and some travel in the mountains, including Glacier National Park and its environs. In 1919 I crossed a small glacier while descending Long's Peak in Colorado. A recent source of information is a delightful 1983 edition of Time-Life Books, "Ice Ages", borrowed from L.G.M.C. member Florence Boring. It relates to a fascinating field of interest, never to be exhausted.

My first contact with this subject was in a glacial quartzite rockpile on our central Burt County Family farm, a common eastern Nebraska feature. We had a scientifically inclined High School Superintendent, Mr. John L. McCommons, who taught our Geology course in the Craig, Nebraska School. Our field trips were limited, but inspiring; our equipment almost zero! That early experience was never forgotten.

Glacial deposits are found in Lincoln and nearby areas. A huge boulder is on the west side of 14th St. north of Belmont suburb (don't try to pick it up!) There are numerous sand and gravel pits of glacial origin in Lancaster County. We need not go far to find ice age evidence here.

Probably there will be future ice ages, but when and where is not easily predicted. There is little doubt about the past, and they are expected again, and they last for thousands of years. The most recent one ended about 10,000 years ago; some remnants still remain.

Greenland, in the north, and Antarctica, in the south are still covered with ice sheets thousands of feet deep. The Greenland sheet's margin seems to have receded about 120 miles, average, in 12,000 years. Some coastlines have risen nearly 400 feet because of reduced weight of ice. This rise has been noted in other areas of former glaciation. Resilient earth!

So many factors relate to glacial periods, and all must be considered before conclusions are drawn about when, where and why they occur. Among them are: the slow but certain drift of large continental masses on the earth's surface. Polar areas do not include the same masses forever, and the same is true about the tropics. Glacial features are found in the Sahara which now is believed to have been part of a huge South Polar Continent.

- continued

ICE AGES - When, Where and Why - continued

The angular tilt of the earth's axis in relation to the plane of its orbit slowly changes. The orbit may change pattern, becoming more or less elliptical. When extremes of tilt and orbit having the same climatic effect coincide, the earth's climate may be greatly changed. A glacial period might occur.

The rotating earth wobbles like a spinning top, in about 24,000 year cycles. The magnetic polarity is slowly changing positions and may even be reversed. Its last polarity reversal was about 700,000 years ago. There have been 19 stages of warming and cooling during that period of time, related or not.

Radiant energy from the sun varies with solar changes, and the earth's atmosphere changes in the amount of energy it allows to penetrate and be retained by land and water surfaces. These earth variations are due to several factors; biological, geological, volcanic and human activities such as combustion of fossil fuels. Natural erosion shifts the location of earth mass, and so do many human operations such as forestry, mining, agriculture, industrial processes and transportation. The entire solar system is constantly moving through the universe. All of these factors have some effects on the world's climate to which ice ages may be related.

Modern methods and devices enable scientists to determine past events' time and place with less error. This century has improved methods never before known. The earlier people had to rely on their brains for what they lacked in equipment and accumulated knowledge. Time-Life's "Ice Ages" describes some modern techniques used in determining dates and other data, such as Oxygen isotopes, Carbon-14, Uranium decay, polarized light, electron microscopes, computers and many devices of recent use.

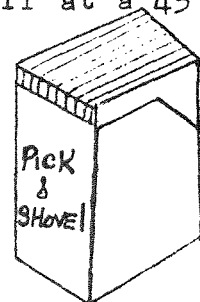
Some indications point to the possibility that the earth may have already started on a new Ice Age cycle. Probably the last glacier "has gone back after more rocks." This summer's heat notwithstanding.

- Submitted by J. D. Young

* * * * *

TIMELY TIP:

Safe place to keep your bulletins (or magazines) for future reference. Cut the top off a detergent box with a razor blade or some sharp instrument. Then cut the corners off at a 45° angle so the dates will show. Spray paint or cover with pretty paper. Print on the back the name of your bulletin and the year. Set on book shelf or wherever you wish.



- Via SCRIBE, Winter '82

NORTH FORK BONANZA

I had been getting very frustrated just sitting and waiting for the hot weather to break late in July. I kept watching the weather reports every Saturday and Sunday night hoping for a cooling trend. As you all know by now, it never happened.

I decided I'd take a trip down to the north fork of the Nemaha River around the Humboldt/Table Rock area, despite the high 90s temperature predicted for Monday, July 25. I had done some homework on the area with the help of Roger Pabian of our Lincoln Gem & Mineral Club. He had taken me to the Geological Survey Department of the University here in Lincoln. I obtained topographical maps of Pawnee and Richardson Counties for a small amount per map. As it turned out, I would have paid more if I had known how precious those maps would be to me in the following weeks to come.

As you all know, topographical maps show rises and falls of the ground contours of certain areas. They also show gravel bars along the north and south fork of the Big Nemaha River. These maps gave me new hunting grounds for Lake Superior agates, Nautiloid shells, honey agates, and many other exciting finds one can make if you're patient and can stand what Mother Nature dishes out.

I left Lincoln at 5:00 a.m. on the 25th hoping to get down on the river by 6:30 and beat the intense heat predicted by the weather service for that day. Upon my arrival to my previously-selected area close to Table Rock, Nebraska, I grabbed my rock-collecting gear and noticed I'd forgotten my canteen. I did, however, happen to bring a three-gallon thermos full of ice water. Since I didn't plan on straying very far from my car, I decided to leave it and return for it if the rock hunting panned out.

I selected this area because it was close to Table Rock and because I hoped it was so close other rockhounds might have overlooked it. I searched for a somewhat easy spot to lower myself and my gear down the steep banks of the north fork. In some areas the river banks are 20 to 30 feet high and one must take caution and use good common sense in selecting a safe spot to climb down to the gravel bars. Once down on the river, I started walking and had gone about three blocks before I came upon a rather large gravel bar. As early as it was, I was still quite hot, mostly because of the humidity.

I assumed my bent-over-at-the-waist posture and slowly worked my way across the gravel bar, crisscrossing the gravel as I walked. I always try and walk towards the direction of the sun and hope to see reflections through the sometimes transparent Lake Superior agates. About five minutes into my venture, I picked up my first Laker. It was about the size of a silver dollar and banded in red and whites. I looked my find over and combed through the area around the Laker I'd found. I was once told by an older lady I'd met on a previous trip that if you find one Laker, chances are there's another close by. Of course, I took this as a strange superstition she had, but I tried it out. In this instance, she was right because just three feet away I picked up my next Laker. Another beauty,

only smaller than the first with brown and white banding. While looking for Laker in this area, I concentrate on red and dark glassy colors which seem to be the most common color of agates in southeast Nebraska.

After finding several other agates on this gravel bar, I came to the conclusion that nobody had hunted this area for quite awhile. I already had as many agates as I usually have on one day's findings, which on the average is around six or seven. At the end of the first gravel bar, I stopped and looked upstream and noticed a huge gravel bar even bigger than the one I was on.

Because an hour and a half had gone by, I started thinking of my thermos I'd left behind in my car at least five blocks back. It was very hard to tear myself away from the gravel bar I was approaching and thought, "This must be a small portion of what 'Gold Fever' is like." I returned to my car quickly and returned with my thermos in hand to the large gravel bar. I set my thermos in a shady spot and started looking with great excitement. There must have been hundreds of thousands of rocks to look at on this one bar, and I swore to myself that I'd try and look over each and every rock. This, I knew, was impossible, but I told myself this so I would take my time and be patient.

I had strayed only a few yards from my thermos when I looked up ahead of me several feet away and noticed a fist-sized red and orange agate just sitting on top of the gravel like someone had set it there. I sat stunned and just stared at it for several seconds before picking it up and examining it. Once I did, I was overjoyed. It had red and white banding on almost the complete nodule--one of the best I'd ever found in my six years of hunting this river.

This one agate only drove me into a frenzy to find others. Upon reaching the end of this particular gravel bed, I'd located another 25 Lake Superior agates of mixed sizes, mostly a few inches long. I did have at least four under a pound or close to a pound, which for Nebraska, I figure, are quite large. I decided to go back to the shade where I left my thermos and greedily look over my findings. I rested for at least half an hour and noticed how really tired I was getting because of the rising temperature. It was getting close to 100 degrees.

I decided to quickly go back over the bar again and then return home. I was very glad I did because halfway across the gravel bed, I found, buried, the largest Laker I found on the trip. This specimen was about a pound or a bit over a pound and dark brown and orange in color. The pits on the surface of this particular agate were a dead giveaway.

I returned to my car and proudly drove back to Lincoln with 32 agates in my possession--my best hunting in southeast Nebraska to date. This trip should prove how really good hunting agates can be in Nebraska. Several years ago even I didn't know how close I lived to a vast treasure chest just waiting to be opened up in Nebraska, our home state, which I'm happy to be part of.

TOURMALINE

Tourmaline alternates with opal as the birthstone for the month of October. Tourmaline comes in nearly every color. Red, yellow, blue, green, brown, orange, black, and other colors are to be found. In the past, it was not uncommon to see the various colors of tourmaline given some gem name. For example, red tourmaline was referred to as rubellite; blue tourmaline was sometimes called indicolite, and green tourmaline was sometimes called Brazilian emerald. Such designations are not often used in the modern gem trade for they take away from the real nature of the gem and imply that it is something that it is not. The preferable trade practice now is to simply call the stone red tourmaline, green tourmaline, etc.

In addition to the transparent faceting grades of tourmaline listed above, there are chatoyant stones that produce a fair to good eye, but never a strong eye such as quartz or chrysoberyl can produce. The eye is produced by needle-like inclusions or liquid filled or air filled tubes that are parallel to the c-axis of the tourmaline crystal, which is usually a long, striated prism. Asteriated tourmaline is unknown.

Watermelon tourmaline is a variety in which the center of the crystal is red and the outer portion of the crystal is green. Tiny black inclusions in the red appear almost like tiny watermelon seeds. A similar variety of tourmaline is the parti-color, except, in this case, the color zonation is seen along the length of the c-axis of the crystal rather than perpendicular to it as in the watermelon variety.

Chemically, tourmaline is a very complex silicate of boron and aluminum. Many substitutions can be made in the metal ions in the crystal lattice and a complete chemical formula could take up the rest of this page. Tourmaline crystals form as a late stage hydrothermal product in the crystallization of granitic magmas. The tourmaline occurs as large, well developed crystals in pegmatites, dikes of very coarse grained, coarsely crystalline rocks that traverse plutonic terranes. Some excellent examples of pegmatites are to be seen in the Black Hills of South Dakota. These pegmatites contain some finely colored, blue tourmaline. Unfortunately, the crystals are usually badly shattered.

There are several classic localities of tourmaline in North America. Paris, Maine, and Himalya Mine in California have been classic localities. Most of the gem tourmaline now sold comes from Brazil, where it is obtained as a by-product of strategic mineral mining operations.

Tourmaline is usually easy to identify. It has a very characteristic index of refraction---1.620-1.640. The birefringence, or difference in the two refractive indexes (.020) will cause a slight doubling of the back facets to be seen through the stone. The specific gravity of tourmaline is about 3.10, and it will sink very slowly in the 3.06 heavy oil. Characteristic inclusions include some thread-like strands and needles or liquid or air filled tubes running the length of the crystal. Tourmaline is nearly opaque when viewed through the c-axis, but a thin, polished slice can produce a fine optic-axis interference figure.

Tourmaline needles can occur in clear quartz, forming tourmalinated quartz, or these needles can form the sagenitic inclusions in agate. Bring some examples of tourmaline---either as cut stones or as inclusions in other stones. Cases will be furnished.

Roger Pabian
Education

OPAL

Opal alternates with tourmaline as the American Gem Society's choice of birthstone for October. Except for the SiO_4 ion, the two have little, if anything in common. Opal usually forms as a weathering product of various kinds of volcanic rocks such as rhyolite or even andesite or basalt. Opal is amorphous and has the aggregate reaction when viewed with crossed polarizers in a polariscope. Opal contains from about 3 to 10 percent water in the finer gem grades. The chemical formula should be expressed by $\text{SiO}_2 \cdot n\text{H}_2\text{O}$.

In the past, it was believed that opals were at least partially crystalline. Australian researchers have examined opal carefully with scanning electron microscopes and have discovered that part of the structure of opal is made up of tiny spherules of silica that are arranged as tiny octahedra within the body of the amorphous opal. The spherules are non-crystalline, but they are so tiny that they produce a polariscope reaction of an isotropic substance.

Perhaps the best known source of opal is Australia. There are a number of widely spaced, highly productive opal fields there. These include such well known ones as Coober Pedy, Andamooka, Alice Springs, Lightning Ridge, Tintinbar, and Alice Springs. Probably the best opals come from Andamooka or Lightning Ridge. The Coober Pedy opals are normally shunned by the opal connoisseur.

In the United States, gem grade opals are not common. Opals showing play of color have been found in Nevada, Oregon, Idaho, and Texas to mention a few areas. Much of the material from the United States occurs as thin layers of colored opal situated between thicker layers of potch. Although some nice doublets can be made from these opals, they are hardly worth a great deal of time and effort. They do provide a challenge to the cutter's technical expertise but do not provide a very valuable stone when all is done.

Historically important sources of opal have been in Czechoslovakia and in Hungary. In more recent years, Australia became the world's leading opal producer, the earliest fields having been discovered by Tully Woolaston in about 1890. Opals have also been found in the Queretaro area of Mexico. Much of this material is of little value as gems as it fractures badly upon drying. Its body is also somewhat milky.

Opal is not very strong. It has a hardness of $5\frac{1}{2}$ to 6 but some has a very easily produced fracture, giving the stone the strength of something as peanut brittle. Gem grade opals normally have a specific gravity of about 2.15.

Opals are normally easy to identify. Most show by their play of color, and not fire. There is a great deal of confusion in opal terminology, and the student should consult Shipley's dictionary of gems. Gem opal usually has a refractive index of 1.45.

The chief problem with opal is that cutters try to upgrade the stone by making a doublet or triplet (a doublet with a quartz or synthetic spinel cap). The back stone of the assembly is often painted black and these are usually easy to recognize. Assembled stones with unpainted back up stones can often be very difficult to recognize.

There is nothing wrong in making doublets or triplets, but it is unethical to represent them as the more valuable solid opal gems. Bring opal for display.

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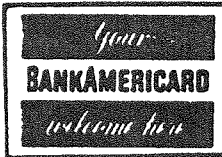
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Junior membership fee \$1.00 (age 12-16)

Family membership fee \$11.00 (husband, wife and all children under 16 - permanent residents of household)

New membership must be approved by the Board, after applicant attends at least one (1) regular meeting of the club, and pay the above dues plus \$1.00 registration fee.

DON'T FORGET:

Our next General Meeting will be October 22nd at 7:30 P.m.,
Nebraska Center for Continuing Education, 33rd & Holdrege.

Special treats are planned with a Special Program,
Minerals in 3-D.

PLEASE NOTE:

November meeting is moved up one week to November 19th,
due to Thanksgiving. Silent Auction at this Meeting.

BRING YOUR ROCKS!!



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Exchange Editor: Vera Lyman
420 N. 56th St.
Lincoln, NE 68504

John & Lillie Lewis
6225 Judson St.
Lincoln, NE 68507