PICK & SHOVEL

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...BABY FOSSILS

Volume 32, Number 1
September,.....1991

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

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1 Year: Ed Ridge, Roger Pabian

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2 Years: Bob Wright
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1992 Show: Phyllis Parks
1991 Swap: David Heffelbower
1992 Swap: Roger Pabian

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David Heffelbower
Francis Belohlavy
Shirley Rockel

YOUR PICK & SHOVEL STAFF

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Financial Reporter: Phyllis Parks
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CALENDAR OF EVENTS

SEPTEMBER MEETING: Saturday, September 28, 1991, 7:30 P.M.
Norfolk Room, Nebraska Center for Continuing Education, 33rd & Holdrege Streets.

PROGRAM: Gems of the Smithsonian, a National Geographic Society Videotape. A very fine production that has been viewed on public television.

JUNIOR MEETING: LG&MC youth will have a kickoff party at the home of Janet Wright, 3715 South 33rd, at 1:00 P.M. For information, call Janet, 488-1884.

COMING EVENTS: SHOW: Loup Valley Gem & Mineral Society, Schuyler, NE, September 28, 29

SHOW: Siouxland Gem & Mineral Society, Sioux City, IA, October 5, 6

SHOW: Nebraska Mineral & Gem Club, Omaha, NE, October 5, 6

SHOW: Topeka Gem & Mineral Society, Topeka, KS, October 12, 13.

SHOW: Fort Kearney Rock Club, Nov. 2. 3, Hilltop, Mall, Kearney.

SHOW: Wichita Gem & Mineral Club, Wichita, KS April 24, 25, 26, 1992. Rocky Mountain Federation Show.

REGIONAL SHOWS:

1992

		AFMS			
HAYWARD, CA Aug. 21-23	HARRISBURG, PA SEPT 19-20	CLEVELAND, OH JULY 23-26	WICHITA, KS APRIL 24-26	ALPINE, TX APRIL 4-5	BUTTE, MT (NO DATE)

FUTURE MEETING DATES, PLACES: October 26, time and place to be announced. Dessert Supper. Our Halloween Special.

DISPLAY MATERIALS: Bring some of your summer field trip or show acquisitions. Cases to be furnished.

PRESIDENT'S MESSAGE

SALT CREEK SAPPHIRES:

We found this item in Michelle Carr's "Local Exchange" column in the 8-19-91 edition of the Lincoln Journal newspaper and were amused.

It seems that a woman visited the House of Gems store in Havelock to sell 30 green sapphires to owner, Louis Mitzner, who wasn't interested. As she exited the store, she attempted to place the gem packet in her pocket. A short while later, she returned to the store because she could not find the stones and wondered if Mitzner had seen them. Outside of the store they found a wind blown gem paper and only 15 of the gems.

Later in the day, two men having heard of the incident, showed up with a shop-vac to try their luck - and had none.

The largest of the missing stones measures about 3/4"x 1/2" and the total value of the cache is about $2,000. We expect that Mr. David Heffelbower is at this minute organizing a field trip.

ALBERTA DIAMONDS: (Also from the Lincoln Journal)

Tiny diamonds found in southern Alberta, apparently came from meteors that struck the Earth about 65 million years ago. A Canadian government scientist claims that there is no way that the microdiamonds could have been formed by a volcano or other geologic processes.

WHO'S BURIED AT GRANT'S TOMB?

SRI Gallup recently polled 1000 Americans on behalf of the Wheat Foods Council. Some of the inane answers they received from their queries has the council wringing their hands about the job they have yet to do to educate the public about wheat. About 52% of the respondents thought that oatmeal came from wheat!!!

Who invented the Singer sewing machine? Who made the Ford automobile? Who first Pasteurized milk? Let's not worry about wheat and the food council. It appears as if our educational system has failed us and that our needs are a lot more basic than the knowledge of grain products.

FALL GEM SHOWS:

Please consult this Pick & Shovel for dates and venues of the fall gem shows. It is important for us to support our friends from other gem clubs who attend our gem show.

LAW OF THE FAST LANE:

If you change lanes, the one you just left will start to move faster than the one you are now in.

FRED B. HOLBERT

CONGRATULATIONS, ADELINE

Adeline Nolde has recently retired from many years of service in the University's Department of Engineering Mechanics. Adeline has asked that in honor of this event a scholarship be established in memory of Howard J. "Jim" Taylor, Jr. $50.00 from the club's treasury as well as donations from private sources have been received to date. Club members may contribute to the fund by sending checks to Phyllis Parks, Treasurer, 2435 S. 19th, Lincoln, NE 68502.

Thank you, Adeline, for sharing your retirement gifts in this most splendid manner. We wish you many happy years ahead. +++

OUR SYMPATHIES

During the summer months, Lincoln Gem and Mineral Club lost long-time member Lynn Wells. Lynn participated in many club activities and especially liked field trips. We extend our deepest sympathies to his surviving family and friends. +++

CARD OF THANKS

To

Thank You

Gratefully acknowledging your donation to the

Memorial Fund of St. Paul's United Church of

Christ of Lincoln, Nebraska in memory of —

Lynn Wells

The Memorial Committee

BOOK REVIEW

Achate-Bilder im Stein (Agates-Pictures in Stone), Jospf Arnoth, Naturhistorisches Musuem, Basel, Switzerland. Bucherverlag Basler Zeitung/Birkhauser AG. 103 pages, illustrated.

Each writer who authors a book on agates grapples with the depiction of the entrance or exit conduits in agates. They struggle with the question: "Do the canals frequently represented in agates reveal the entrance of colliodal silica or the exit of colloidal silica?" While in invertebrate paleontology, there are "splitters" and "lumpers" of genera, agate-ophiles stand firm as either "entrance canalers" or "exit canalers." Mr. Arnoth, while professing to be neither, appears strongly slanted toward the "entrance canalers," as revealed by the numerous examples mentioned in the color photo section.

Achate-Bilder im Stein, while not strong on the origins of agates and their stratigraphy, does briefly touch upon the subject. The color plates accompanying the text reflect these areas more strongly. The photographs of an assortment of agates emphasizes their structures and mineral inclusions.

The text itself dwells more upon the romance and aesthetics of agates: how they are depicted in literature and science; how best to cut agates for maximum effect; and what kinds of "pictures" they reveal when cut and polished. There is also a section dealing with the different types of agates and their classifications.

The book's strong point is the excellent color photos and their captions. The author presents agates from around the world: Brazil, Germany, Czechoslovakia, Australia, Mexico, Oregon, and Morocco, among others. For some strange reason, however, Lake Superior agates are omitted. One of the most striking photos depicts miniature thundereggs in rhyolite, an image redolent with genetic implications. Mr. Arnoth, it seems, is inclined toward the Friday Ranch Thundereggs as a model for agate formation.

Overall, Achate is an interesting primer on agates...especially if you can read German. While certainly not all-inclusive about agates (as the bibliography shows), the photos make this book a welcome addition to one's personal library or coffee table. ---Andrejs Zarins

NEW GLASSES DEPARTMENT

For the past couple of years many of my field trips have been less than productive. Recently I was fitted with a new pair of glasses and over Labor Day, Fred Holbert, Bill and Betty White and I went agate collecting in Richardson-Pawnee counties. What a difference a new pair of bifocals made for me---14 Lake Superior Agates in about 4 hours of collecting.

Fred was not so fortunate. He used new bifocals that he had ground especially for playing golf. His yield was much less. I have been telling Fred all along that golf is a game solely for the wicked rich. Now, maybee he will pay heed and have agate collecting lenses made. At any rate, new glasses might help up your field yield. RKP

NEW ARRIVAL

Elizabeth Glynn Zarins arrived at the home of Andrejs and Barbara Zarins on Sunday, September 1. Our best wishes go to Elizabeth and parents. +++

GETTING THE BEST MINERALS FOR THE LEAST MONEY.
(Quality, rarity, and attractiveness)
Edward P. Pedersen
May 7, 1991

Why do some mineral collectors seem to make money on their hobby while others never seem to get anything back when they try to sell their collection?

It is possible to have both the enjoyment of collecting minerals and to end up with a collection that will increase in value, or at least retain a value somewhere near what you paid for it. To do this you need to buy the right specimens, not just any specimens offered by the dealers. The first concept that you have to learn and apply is the habit of actually looking at the specimens that interest you, before you buy them. This is not as easy as it sounds. You will have to step back and consider the specimen for something other than its natural beauty. To do this you have to learn what combination of factors result in the value (and usually, but not always, the price) of a mineral specimen. These factors are quality, rarity, and attractiveness.

The most important factor is quality, and the most important aspect of quality is the freedom from damage (breakage). Mineral specimens, in general, are relatively fragile items. They are easily damaged during their recovery in the field, during transport and handling, and some are even sensitive to heat or light. Damage to a specimen may be conspicuous (such as bruises on velvet malachite or the yellow mimetites from Mexico) or hidden (broken crystals in a group of small quartz crystals or on some wulfenites). Usually the beauty of the specimens tends to over shadow any damage. The tips of quartz crystals usually have been damaged, but most rockhounds do not even notice. To examine a specimen for damage you must actually look at each crystal on the specimen and you have to know what a complete crystal of that mineral looks like. Examining favorite specimens is sometimes frightening, as you find they aren't as perfect as you thought. Most collectors will say: "Why bother, it still looks pretty". The point to remember is that the price of an undamaged specimen should be several times that of a similar specimen with damage. Damaged specimens do not gain in value (except by the yearly decrease in what a dollar will buy). When examining a number of nearly identical specimens in a dealers booth you can often find that one or two will be free of damage, or have a minimum of damage. If the other factors, such as attractiveness, are the same you should be able to figure out which one to buy.

Another aspect of quality is crystal size and crystal habit. A good rule of thumb is that the larger the crystals the better the specimen, provided that the crystals are clean and well formed. In the real world the most perfect crystals are of microscopic size. Crystals grow by adding layers to the outside, while animals and plants grow by adding material to the inside. Any interference during growth will produce a distorted crystal. Several minerals

growing in close proximity will restrict the space that each crystal has to grow. Therefore many of the larger crystals are not very well developed.

Along with the size of crystals and the freedom of damage quality may depend on the amount of non-specimen (rock) material that is visible when you look at the specimen. The most valuable specimens are those that have the largest amount of the mineral(s) of interest. A specimen with a small (half inch) emerald crystal imbedded in a basketball-sized boulder is not as valuable as one with the same crystal in a one inch specimen. The more mineral and the less rock (matrix), the more valuable the specimen. Those that are acquiring the specimens to study them from a geologic (mineral paragenesis) point of view may have different requirements.

Rarity is one of the points that is often used by well meaning dealers to sell specimens. The dealers are honest when they make statements such as: "this mineral is rare from this locality", "this is a rare mineral". What do these statements actually mean to the prospective purchaser? Rarity, as used by the judges in AFMS competition, means the number of occurrences on a world wide basis. Unless you are collecting minerals from a restricted area getting the only specimen of quartz ever found from that area means nothing to you. Also getting a mineral that is rare, but ugly or ultra microscopic in size, does not help your collection. Buying a mineral that is rare, but is damaged or has deformed crystals, represents a bad purchase. Some minerals rarely come in crystals, so specimens with crystals may qualify as rare.

The last factor to consider is attractiveness of the specimen. Some mineral specimens look better than others of the same mineral from the same locality. One exceptionally large azurite crystal was displayed by a friend of mine. It was nice but always lacked something. Another friend bought it and displayed it with the long axis sitting upright rather than on its side. The difference was almost unbelievable! I would say that the change in display angle may have doubled the apparent value of the specimen. Angle of lighting on the crystal faces, slight differences in color, and many other factors add up to make one specimen much more valuable than another, although at first glance they may look similar.

How do you apply this to building a collection? First, always get the highest quality you can possibly afford. Second, look for "sleepers" which are underpriced due to being mixed in with similar specimens of lesser quality (this is often true when a dealer has acquired a number of specimens from the same locality). I have found good mineral specimens in batches of "cutting-grade" materials (especially tourmaline and quartz crystals) where the dealer had not looked at each piece. Once I found a quartz crystal group that was dirty and negotiated down the price. Upon leaving the shop I blew off the dust and increased the value. Finding specimens that can be trimmed to remove matrix (rock) material is also way to gain value (if you are willing to risk the trimming).

A PRETTY OLD CRINOID?

by Roger K. Pabian

How old was a particular organism now found as a fossil when it died in terms of years, months, and days of life? It may not be uncommon to read in an obituary that someone was 83 years, 5 months, and 27 days old upon passing, or to read the dates on a tombstone and subtract. When we are dealing with fossil animals who kept no legal records, our problems of telling how old a particular animal or plant was when it died is quite a bit more difficult but not impossible.

Paleontology is a subjective science and to simply tack a generic and specific name onto a fossil is leaving the job half done at best. To properly identify a fossil is, of course, important but to think that that's all there is to it is not correct. Why would we want to know how old an organism now fossilized was when it died?

Ontogenies or the changes an organism goes through during growth are important problems that can be solved by being able to establish a relative death age for a fossil. In older times, paleontologists tended to describe a new species for every size and morphologic variation that was visible to the naked eye. It is not uncommon to read old fossil descriptions with species names and the only comments to follow is: same as above species except (smaller)(larger). Many old timers never considered relative age of organisms in describing fossils, or even some modern animals. We can establish the relative age of one example of a species compared to another with some ease; the larger most commonly will become the senior member.

Environments can often effect the size of an organism. Commonly, large, thick-shelled animals prefer warm, shallow water and small, thin-shelled animals prefer cold, deep water. If a paleontologist is working with a species that might have been able to cross over from one environment to the other, it is necessary to look for features beyond absolute size that might suggest adolesent or gerontic stages of life.

It is pretty easy to tell the relative ages of trilobites. Juveniles will have fewer segements in their moveable thorax than adults. Protaspid trilobites have no movable thorax, meraspids have fewer segments in the thorax than adults or holaspids. Adult trilobites could keep on moulting and increase in size, so size has some bearing on the relative age of a trilobite. Not always, though, for in modern arthropods, if food supplies are short, an individual may shrink between moults.

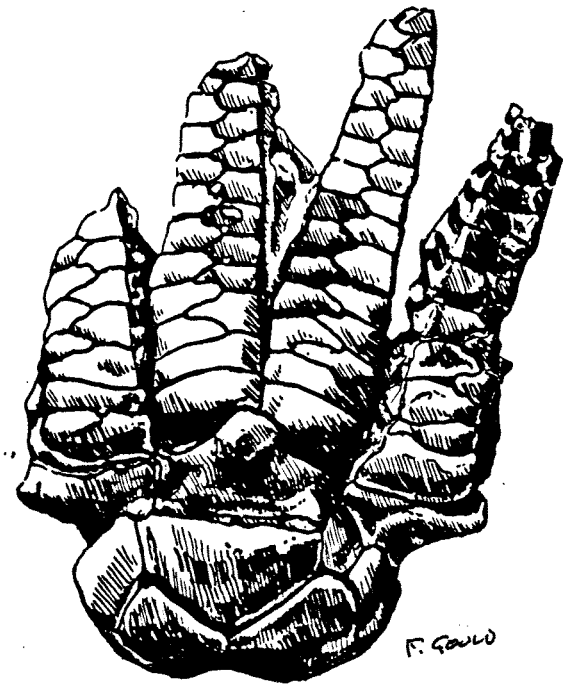
Babies or larvae of many marine animals play some tricks that tend to increase their surface area to volume ratio. Baby trilobites and other baby arthropods tend to have numerous spines that support membranes to increase surface area and buoyancy of the animal. Baby trilobites appear to have been photo-negative; i.e., were sufficiently diaphnous to be transparent in the water column. Larval trilobites are more common where they could become pyritized after death, so they are often more common in deep, cold-water, reducing environments.

Baby crinoids have a particularly neat trick to increase their surface/volume ratio. They develop very bulbous plates and the cups of these fossils will often have deep dimples at plate junctions as a reflection of this. The crinoid animal has five rays, called A, B, C, D, and E. The last two rays to develop are B and E and they tend to trail in development throughout the life of the animal. Often, a baby crinoid will show but the A, C, and D rays.

The arms on young crinoids differ somewhat from those on their older siblings. In a very young crinoid, the arms are made up of wedge-shaped or cuneiform segments. In many crinoids, these segments become completely biserial and will have a zig-zag rather than a ladder like arrangement in the older individuals. Between juvenile and gerontic stages, the lower parts of the crinoids arms will have the ladder-like segments whereas the upper part will have the zig-zag segments and there will be a gradation between the two.

In the local Pennsylvanian and Permian rocks in Pawnee and Richardson counties, a tiny ammonoid called Neoaganides can be a very common fossil in what we think were deep water environments. Even if they are tiny, many were oldsters when they died because they show septal approximation or a an anterior crowding of the septa between chambers, a sure indication of old age in the goniatite crowd.

Being able to recognize babies from adults will help paleontologists settle many species problems by showing the variations within a single species throughout growth. Some problems related to the evolution of marine invertebrates can also be approached with new data that the lack of a growth sequence would provide. Being able to recognize babies will also tell paleontologists what kind of fossil assemblage is being examined. A high baby/adult ratio will indicate a fossil community or the make up of the community when the animals were all alive. Don't sell insurance policies to young marine invertebrates as they have too high of a mortality rate. Few babies might suggest a winnoded fossil assemblage where currents washed out the dead larvae. J. A. Fagerstrom worked on these problem at Nebraska in the middle 1960's.



The crinoid pictured at the left is still enigmatic. It is a Delocrinus hemisphericus (Shumard) from the Ervine Creek Limestone near Union, Cass County, Nebraska. Harrell Strimple and I reported it in 1974. It was found by Ted White of Omaha. The dimples at the plate junctions suggest that it is young but the biserial or zig-zag arms suggest that it is a senior citizen. This particular crinoid was studied by quite a few other workers in the late 1970's and it was pictured in many news releases. The late John Burke of the Cleveland Museum of Natural History told me shortly before he died that he thought the crinoid was about 4 1/2 years old when it died, and that was old. He never told me why but said he was readying that material for publication.

I hope that the above paragraphs give you a bit of an idea as to why just identifying a fossil is only a very small part of a paleontologists work. +++

Florence Lueninghoehner attended the 1991 California Federation of Mineralogical Societies show last summer. She picked up some bulletin editors materials and sent them to me. Thank you, Florence, for your thoughtfulness. I will utilize some of this material from time to time.

Who, Me? Write an Article?

Anyone can write.
Here's how.

To start with, of course, you have to have something to write about. That part is easy. If you're going to be in charge of a field trip, program, workshop, picnic, show, or other activity, you'll need to write something about it to let other members plan to take part. If you're not in charge, but just enjoying the activity, take the responsibility of writing about it afterward. Let those who didn't take part find out what they missed.

There are many other subjects on which other members would appreciate sharing your experiences, such as how you store your collection, how you set up your workshop, an interesting trip you took, a visit you made to another society's show, or a short report in your own words of some news you've come across recently. (Don't just hand the Editor something you've clipped from a magazine or newspaper. There are extremely high fines for plagiarizing material someone else has copyrighted.)

So-o-o, you've got a subject. Now what?

1. **Grabber** : Can you think of a title or a first line that will get people fired up to see what else you have to say? No? Actually, you may have to write the rest of the article before a terrific opening idea occurs to you, but keep thinking about it.

2. **Who - What** : A news article isn't supposed to be a puzzle. Let people know, up front, what you're talking about.

3. **Where - When** : The time and place can be critical, so be sure to include them, when appropriate. If they're for a future event, be specific and be correct.

4. **Details** : This is the interesting part. How do you get your act together? Here are some suggestions. Your creativity may lead you to others.

- Narrative or chronology - Telling about things in the order in which they happen, such as a field trip or how to make a piece of jewelry

- Classification - A major subject with several subtopics, such as "Ways of Finding Gold," "Essential Tools for a Rockhound," "Three Famous Gems"

- Media Style - Most important information first, proceeding to less important, in case readers drop out before finishing (Do people do that? People do.)

5. **Conclusion** : This may be a summary, the point you wanted to make, or just a final observation. It might, but doesn't have to, refer back to your opening "grabber."

Give your Editor something to edit!

--Marion Fowler
CFMS Bulletin Aids Chairman,

CFMS Society Aids Seminar
sponsored by Oxnard Gem & Mineral Society, May 25, 1991

OTHERS WRITE

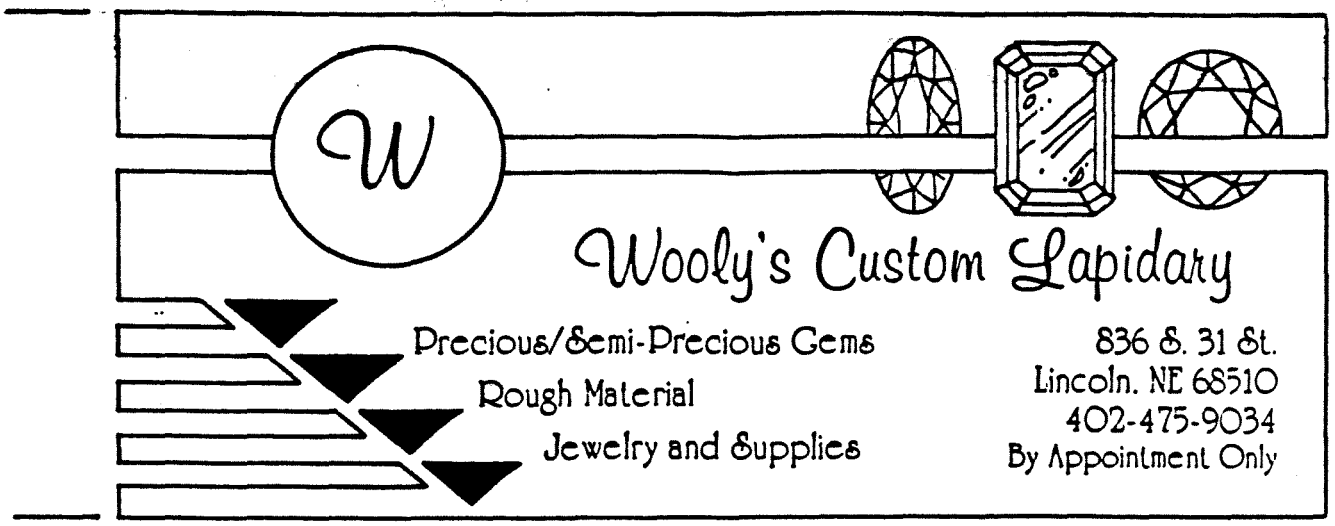
From OSAGE HILLS GEMS, Bartlesville, OK, March, 1991

Rutile -- C. A. Stratton

Rutile (titanium dioxide, TiO_2) is an interesting material from a gemological standpoint. It is the gem which "didn't quite make it", either as the natural or the synthetic, yet it does intrude upon the gem scene in a fascinating, often beautiful manner. Rutile crystallizes in the tetragonal system (a square post to the uninitiated). These crystals are usually elongated and striated, having grooves and truncated edges running the length of the crystal. The usual color of the mineral is dense black, in which form it is the best ore for titanium. Specimens having any significance as gems or collector's crystals occur in red, pink, orange,yellow, or brown colors. These are scarce, as attested by the fact that only three small, dark brown, transparent faceted stones are shown on page 205 of Schumann's Gemstones of the World.

Chemists know that the true color of TiO_2 is *white*. That is the color of titania pigment for paint, also the color of skywriters' smoke. One would suspect that the color of the natural mineral would be due to the presence of iron. Certainly ilmenite, $FeTiO_3$, is a dense black. However, the advent of the Verneuil ("Ver-noy' ") synthesis for rutile both lightened the color of the material and gave another explanation for the black color: a deficiency of oxygen. The Verneuil synthesis uses a downward pointing oxy-hydrogen blowpipe. Through this flame, the desired gem material is sifted; it then falls on a target where it melts and begins to form a "boule". The target is slowly moved downward, allowing the material to crystallize and the boule to grow. With titanium dioxide, this growth of a boule did not occur. It was found that the temperature of the flame caused the loss of too much oxygen. With the provision of another tube surrounding the blowpipe and supplying an excess of oxygen, it was found that a boule could be grown. However, the color of the boule was still dark. This situation was remedied by annealling the boule in a furnace containing an oxygen atmosphere.

Enough color was removed from rutile that, in 1947-1948, it aroused quite a flurry as a diamond substitute. In some ways, it actually could be said to surpass diamond as a gem. For instance, its average index of refraction (R.I.) is 2.8, in contrast to a R.I. of 2.42 for diamond. Also, the dispersion of light for rutile is 0.33 versus 0.044 for diamond. As a consequence of R.I., rutile has an adamantine luster (indeed, super-adamantine). Because of greater dispersion, rutile emits a far greater profusion of all the colors of the rainbow than does diamond. But, there are the drawbacks. Synthetic rutile is easily distinguished from diamond by sight because it is too yellow, too "flashy", too "fuzzy" in appearance, and too soft and brittle. The best color achieved might approach that of a "canary" diamond (a sick canary). The deluge of prismatic colors from rutile might be absolutely captivating to the gemologically ignorant, but to the diamond aficionado, it simply screams "fake". The fuzzy appearance of rutile gems comes from the doubling of the pavilion facet lines, as seen through the crown. Doubling is caused by high birefringence: rutile has two indices of refraction, 2.616 and 2.903. These being widely separated, the doubling is quite noticeable, especially with a hand lens or microscope. Rutile, with a hardness of 6 to 6.5, is a little too soft for a ring setting. Old rutile gems are invariably scarred around the facet junctions of the crown. These are attractive objects for recut by the faceter.



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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.

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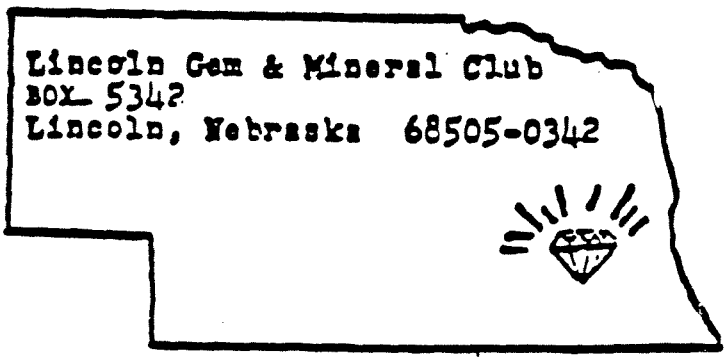

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