

EARTH SCIENCE CLUB OF NORTHERN ILLINOIS 2008

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Paleontology	John Good	1891 Windward Lane	Hanover Park, 60133	630-483-2363
Junior	Open			

John Good & Karen Nordquist are delegates to Chicagoland Gems & Minerals Association.
Betsy and Floyd Rogers are Show Chair for 2008

The aim of the **Earth Science Club of Northern Illinois** is to promote an interest in the Earth Sciences. In addition to the regular General Meeting, study group meetings are held monthly. They are held by groups of **ESCONI** members interested in the studies of Archaeology, Mineralogy, Micromounts, Paleontology, and the Lapidary Arts. There are also study sessions for Junior members to help them learn more about the earth sciences. From time to time field trips are arranged. **ESCONI** has a fine library of books on the earth sciences that are available to members.

We welcome the attendance of all interested persons at any or all sessions. The schedule is printed on the back page (date, time and place of meeting). Specific information is published in this bulletin.

Membership is \$20.00 (which includes the Bulletin) for family membership. Dues are payable either at the monthly meetings or by mailing to the **Membership Chair** listed above.

Deadline for Bulletin articles to the editor is the 2nd weekend of each month.

Articles in this publication may be reprinted if full credit is given the author and **The Earth Science News**. Exchange bulletins may be mailed directly to the Editor.

ESCONI website is www.esconi.org
Webmaster is John Good

*May 2008**President's Message*

April Anderson from the Hawthorne Hill Nature Center thanked our club for donating two framed rock identification charts, a large exhibit case, and minerals and fossils. She said she placed information about ESCONI on the center's welcome table and hopes that we will come visit them sometime soon. She also mentioned that they are always appreciative of and desiring donations of local rocks and fossils. The Hawthorn Hill Nature Center is located at 28 Brookside Drive in Elgin (847) 608-9440.

May 9 General Meeting will feature ESCONI Member Dan Behnke, Micromount Hall of Fame Photographer. His presentation, "A Selection of My Favorites" will show his pictures of his own mineral specimens and some from both the Smithsonian and Harvard.

The next ESCONI Field Trip is May 17, 2008 at Braceville, Illinois and May 18 at Pit 11 in Braidwood, Illinois. Check the web site; We may be going to the Lone Star Quarry May 10.

Don't forget to mark your calendars for the 32nd annual Chicagoland's GEM, MINERAL & FOSSIL SHOW (CGMA). It's held Memorial Day Weekend at the DuPage County Fairgrounds, 2015 Manchester Rd, in Wheaton. They plan to have demonstrations, a children's rock area, educational exhibits, programs, dealers, lapidary arts, jewelry exhibits, faceting, cabochon cutting, polishing gemstones, silversmithing, beading, wire wrapping, and special youth activities and programs. ESCONI's John Good is the Show Chairman 630-483-2363; E-mail at cgma@sbcglobal.net.

Be sure to visit our ESCONI WEBSITE www.esconi.org for the latest in updates. Also, if you have not already done so, remember to send in your annual dues for 2008 (\$20) to our Membership Chairperson Eileen Mizerk.

Jim Fairchild, President
jimfairchild@comcast.net
www.esconi.org

MEMBERSHIP INFORMATION

Many thanks to all of you for getting your 2008 dues sent in. Please check your address label for name, address or other errors. If you've sent in your 2008 dues, the year displayed on the label should be 2008.

As always, if you've recently had a change in telephone or email address, please send that information to me, so our database will be as current as we can make it.

In the July-August issue of our bulletin, we will publish our Membership list with names, addresses, phone numbers and email addresses of all active members. If you do not wish to have your contact information published, please email me prior to June 1, 2008 to let me know to take your information off the published list.

Eileen Mizerk, Membership chairperson
emizerk@comcast.net

MAY 2008 ESCONI EVENTS

General Meeting 8:00 PM, Friday May 9 College of DuPage K-131	A Selection of My Favorites by Dan Behnke, Micromount Hall of Fame photographer and ESCONI member. Visitors are welcome. Refreshments will be served.
Mineral-Micromount 7:30 PM, May 10, 2008 College of DuPage K-131	Morocco Minerals, Fossils and Gemstones by ESCONI members. Visitors are welcome. Refreshments will be served.
Paleontology 7:30 PM, May 17, 2008 College of DuPage K-131	Cretaceous Mammals by ESCONI member, Rob Sula. Visitors are welcome. Refreshments will be served.
Archaeology No meetings due to holiday weekend.	No meetings until fall.
Junior Check Web Site for Schedule	
ESCONI Field Trips	<ol style="list-style-type: none"> 1. Lone Star Quarry - to be announced 2. Braceville May 17; see page 3 3. Pit 11 boat trip - May 18; see page 4
BOARD MEETING 7:30 PM, May 30, 2008 College of DuPage K-131	
CGMA 32nd Annual Gem, Jewelry, Fossil, & Mineral Show & Sale 10 AM - 6 PM Saturday May 24 10 AM - 5 PM Sunday May 25	DuPage County Fairgrounds; 2015 W Manchester Road; Wheaton IL 60187

**Please help at the CGMA
 Gem-Mineral-Fossil Show
 On Saturday and Sunday May 24 & 25**

UPCOMING SHOWS AND EVENTS

May 2, 3 & 4: Kalamazoo MI Kalamazoo Geological & Mineral Society - "Michigan Magic" - Kalamazoo County Expo Center, 2900 Lake St (Fairgrounds), Kalamazoo, MI. Over 50 displays, dealers, games, door prizes, geode cracking, gold mine. Also demonstrations and a Silent Auction. Friday 4 pm to 8 pm – Saturday -10 am to 6 pm and Sunday - 10 am to 5 pm. . Donation \$3, kids under 12 free with adult. For information contact Kitty Starbuck (269)649-1991, Eric Peterson (269)781-7062, Kathie Rush (269)343-8131

May 24 & 25: Wheaton, IL - Chicagoland Gems and Minerals Association - "32nd Annual Gem, Jewelry, Fossil & Mineral Show & Sale" - DuPage County Fairgrounds, 2015 W. Manchester Rd, Wheaton, IL 60187. Dealers, demonstrations, exhibits, kids corner, silent auction, special displays. Food available. Saturday - 10 am to 6 pm. Sun - day 10 am to 5 pm. Adults \$5. Seniors & students \$3. Children under 13 free with adult. Free parking. For more information call (630) 377-0197 or email CGMA@sbcglobal.net

June 20-22: Lincoln, NE, "50th Annual Show w/ MWF Convention", Lincoln Gem & Mineral Club, Pershing Center, 226 Centennial Mall 5, Contact: Roger Pabian, 5301 X St. Lincoln, NE 68504, (402) 465-0144, rpabian@neb.rr.com

ESCONI Field Trips

Lone Star Quarry— TBA Possibly May 10, 2008

Collecting Fossils including Shark's teeth and brachiopods
Check the web site for details or contact John Good at 1-630-483-2363 for reservations or e-mail at esconi@hotmail.com

Braceville, IL May 17, 2008

Collecting Mazon Creek Fossils
Meet at 9:00 A.M. Saturday at the BP Amoco in Coal City. No Age Limit. Hard Hats not required.
Take I-55 to Exit 236 (Coal City). Take a right onto Highway 113 (Division Street). Go west to Broadway Street and Division in Coal City.
We will be collecting Mazon Creek concretions from an old spoil pile on private property. Hard hats are not required. Boots are recommended. An Estwing rock hammer is the best tool. A small shovel or pick is helpful. Knee pads, backpacks, fanny packs, extra clothes (you will get wet and muddy) are also a plus. Bring a bucket for the fossils. Also bring insect repellent.

Check the web site for details or contact John Good at 1-630-483-2363 for reservations or e-mail at esconi@hotmail.com

Braidwood, IL May 18, 2008

Collecting Mazon Creek Fossils
See next page for details

PIT 11 FOSSIL TRIP SUNDAY MAY 18, 2008

This trip will be about the same as we did last year. There are a few differences...1 had to send Phil out to find four people that stayed out over pick up time, and One person was not physically fit to be on the trip. These 5 folks are not going to be on the trip. IF ONE OF YOU SEND ME A CHECK, I WILL RETURN IT TO YOU AT THE DOCK.

Cost will be \$15.00 for adults, and \$7.50 for children under 12. All children must be with there parent/guardian at all times. We reserve the right to cancel the trip because of lightening or high waves on the lake, or boat problems Light rain will not cancel the trip. The field trip starts at 9:00AM. Location: Find Braidwood on your map. Go south on Route 53 to Godley. Turn left onto Kankakee Road, the Stumble Inn Tavern will be on the South East comer. Continue to Dondanville Road, turn left to the dock.

Mail checks made to Richard Rock, PO Box 726, Wilmington,60481. By signing your name you agree to the following:

- You agree to do whatever the Captain of the boat tells you to do. Be at the pick up point no more than 4 hours after being dropped off.
- You agree not to sue the ESCONI Club or its members, Com ED, the operators of the boat, etc. for any reason.
- You are responsible for yourself and your children.
- You agree to leave the trip immediately if told to do so.
- This is a family orientated trip.
- This trip can be very physical and you need to be in at least good shape and condition.
- Bring insect repellent. There are ticks in this area, and I have been told some may carry lime disease. Spray yourself several times during the day all over your body.
- You are responsible for your personal items if they are missing or stolen. Bring a lunch in a small cooler, and lots of water.
- You will NOT bring with you a shovel. ANYONE caught digging will be asked to leave the trip. You will be reported to the DNR.

I agree to the above by signing this waiver.

Name (Print) _____ Sign(Clearly) _____

Address: _____

Date: _____ Telephone: _____

Children's Name & Age: _____

E-Mail: _____

Amount Enclosed \$ _____

Reservations Must Be Received No Later Than May 10, after this date - \$20.00 per person.



Board Meeting

February 22, 2008

President Jim Fairchild called the meeting to order. First Vice President Rob Sula talked about getting speakers for future meetings. He has talked to several people including Winifred Creamer who will not be able to come until next fall. Second Vice President Irene Broede said that we are set for our meetings for March, April and May in K-131. Recording Secretary Karen Nordquist presented the Minutes for January 25, 2008 and they were approved as amended.

Treasurer John Good presented his report for 2007. It showed that we had a slight negative income for the year. It was approved. He will clean it up and get it ready for an audit. Jim Fairchild mentioned that there will be a work day at the warehouse tomorrow Saturday at 9:00 to 1:00 to prepare for the March Show. All are welcome to help sort and pack. Historian Judy Dedina had nothing to report.

Co-editor John Good handed out a plan for the April Bulletin. It will be 24 pages. Circulation Chairman Howard Svoboda handed out a report of Circulation Data for 2007 including delivery, printing and mailing information for the year. Delivery time to his address has gone down from 20 days to 7.5 days which is a great improvement. The permit fee has gone up from \$160 to \$175. Membership Chair Eileen Mizerk had nothing to report. Liaison John Good said that there will be a meeting March 3 with more to report after that.

Under Old Business, it was mentioned that Eric Gyllenhaal will again help with the Juniors but does want some more material. John Good mentioned that we need more people to fill cases. We need live auction material and a geode splitter. Rob Sula reported that there will be two COD field trips to Braceville April 19 and May 3 (Editor's Note). Irene Broede reported on the status of ESCONI Associates. Amazon had made a deposit and there has been a sale to the UK. John also had received a letter from COD with a thank you from a scholarship winner. Jim Fairchild mentioned that we have some passes for PaleoFest.

Under New Business Jim Fairchild proposed consideration of Honorary Membership for Howard and Beverly Svoboda and David and Sheila Bergmann for years of dedicated service to ESCONI. It was so nominated, seconded and unanimously agreed. Nominations will be written up and submitted for membership consideration.

The meeting was adjourned.

Respectfully submitted, Karen Nordquist, Recording Secretary

Moon Rocks (Mineral Micromounts Study Group; February 2008)

Man has been fascinated by the moon for centuries. Scientists could only theorize about the composition and origin of the moon until the second half of the 20th century. The cold war and the ensuing space race brought man to the very surface of the moon. Three sources of moon rocks are available for scientific study---moon surface rocks from the manned US Apollo moon landings and the unmanned Soviet Luna missions and moon meteorites. The largest quantity of moon rocks returned to earth is the 382kgs or 842 lbs of samples from 6 Apollo missions (11,12,14,15,16,17). The USSR brought back about 300gs. or .7lbs from the Luna missions (16,20 24). About 33kgs or 70 lbs. of lunar meteorites are catalogued in the scientific literature. Study of these rocks continues to provide insight into questions of the origin and composition of the moon as new techniques are available.

The 832lbs. of moon rocks from the Apollo missions consisted of 2200 individual sample of rocks, pebbles, sand, dust and core samples. The largest moon rocks weighed 11,7 kgs and was collected by Apollo 16. A special building was constructed at the Johnson Space Center to house these rocks. Originally NASA worried that the moon rocks could contaminate the earth. Now scientist and engineers take extreme precautions to avoid the contamination of the moon rocks by conditions on earth. The moon rocks are kept in specially controlled conditions under flowing nitrogen that is continually monitored for oxygen and water content, The pressure in the storage and laboratory areas is kept higher than the outside air pressure to prevent airborne contamination with dust particles. Workers in these areas must wear protective clothing and undergo decontamination procedures. The pristine sample vault is the place where moon rocks that never were outside the laboratory since returning from the moon are kept in stainless steel cabinets under nitrogen. Rocks from each mission are stored in separate cabinets. The samples are stored in aluminum or stainless steel containers, plastic vials or Teflon bags which are covered by 2 hermetically sealed Teflon bags. About 75% of the mass returned from the moon is stored in the vault as 26,000 samples. Another set of samples is stored at a remote location at Brooks Air Force Base near San Antonio in Texas. The pristine sample laboratory and the saw and core areas are working sites where visiting scientist can sample and study these rocks. All the careful controls still apply. Exposure to humid air would cause the iron in moon rocks to rust and the glasses and minerals to turn to clays. Over 100,000 samples have been sent to scientist around the world for study. Any used portion not consumed by the experiment must be returned to the US Johnson space Center. About 45,000 samples have been returned. These are stored in a returned sample vault under normal air conditions. This represents 7.5% of the moon rock mass.

Apollo 11 mission and Neil Armstrong's first step on the moon will forever be one of the world's historic moments. The landing site in Mare Tranquillitatis was selected to minimize risk of landing. The terrain is flat with neither craters nor ridges nearby. The first step on the moon found a "soil" or regolith somewhat porous on the surface but firmer underneath. It consisted of particles most of sand or silt size with larger fragments to pebbles or boulder size. It is composed of rock particles pulverized by countless encounters with meteorites over eons of time. A lunar surface sample was collected first to ensure that moon rocks would return to earth even if the mission was aborted. This took 3.5 minutes. An additional 22 or 23 scoops was collected in 14 minutes. Twenty more samples were selected from 10 to 15 meters from the lunar module in about 6 minutes. A total of 22 kgs. of samples was brought back including 50 rocks, "soil" and 2 core samples. The main rocks found were basalts and breccias. The

Moon Rocks - Continued

Apollo 11 basalts are similar to earth basalts. The dark colored Apollo basalts are mainly composed of pyroxene and plagioclase. These moon basalts contain much more titanium than earth basalts. The basalts were dated between 3.6 to 3.9 billions years old. Moon breccias contain fragments of rocks broken up by meteorite impacts then fused together by heat and pressure from the impacts. Light colored highland anorthosite which is mostly plagioclase combined with the dark basalt to form a breccia. Rocks that are almost pure plagioclase are rare on earth. This sample of anorthosite consisted of a few tiny fragments in the breccia.

Apollo 12 mission included a precision landing and the collection of samples within .5 kilometers of the lunar module. A site at Oceanus Procellanum with few craters or boulders was selected to minimize risk. Again a contingency sample was collected consisting of 6 scoops weighing 1.9 kgs. An additional 14.8 kgs of samples from up to 160 meters from the module were collected in 1.25 hours. Further sampling was done at the rims of craters. One contingency sample of 1.9kgs was from a crater 15 meters away. Samples totaling 17.6 kgs were collected from 5 craters up to 400 meters away. In all, 34 kgs of samples were brought back containing 45 rocks, soil samples and core samples. These samples were expected to be younger with a different composition than the Apollo 11 material. All but 2 of the rocks were basalts. These were 3.1 to 3.3 billions years old. There were more varieties of basalt containing olivine and ilmenite and less titanium. One very unusual rock contained a high percent of potassium, rare earth elements and phosphorus (KREEP). This rock is believed to have formed when the moon was solidifying from a molten state. KREEP rocks were formed from the last of the molten material left after crust formation.

Apollo 14 landed in the Fra Mauro Formation near Cone Crater. This area was a more challenging landing site but was more interesting geologically. Nasa felt they could pinpoint land a lunar module. The Fra Mauro Formation is composed of material ejected by the impact that formed the Imbrium Basin. Longer times on the surface of the moon allowed for more sampling at greater distances from the module. The contingency sample was collected. On the second surface trip the team was scheduled to walk to Cone Crater. Unfortunately walking was more difficult than expected and the team was called back only 20 meters from the crater. Sampling was done along the way. Most of the rocks in the 42 kgs sample were breccias. Many of these breccias were enriched in KREEP first found in one rock by Apollo 12. A few basalts were found. These were similar to other basalts from earlier missions but generally richer in aluminum and sometimes phosphorus. They are dated 4.0 to 4.3 billion years old. These are older than basalts found at mare sites.

Apollo 15 landed at Imbrium Basin which formed 3.84 to 3.87 billion years ago. The site was selected to allow sampling of the basin rim at a place called the Appenine Mountains and to explore Hadley rille. This was the first mission using a rover vehicle which allowed the traverse of greater distances. Surface explorations lasted 7 hours at a time. The mission traversed 28 kilometers using the rover. They collected samples from 12 sites including the last contingency sample collected on any mission. The surface rocks collected from Mare Imbrium are basalts. Like the basalts from Apollo 12, the rocks are low in titanium. They date to 3.3 billion years ago. Observation of Hadley Rille suggested it formed as a lava tube that later collapsed. Apollo 15 found volcanic glass. For lava to form glass, it must cool very quickly as would happen in violent eruptions that hurls material high above the surface before it fails and forms glass beads. This glass formed from material 400 kilometers below the surface. From

Moon Rocks - Continued

the Apennine Front the famous. "Genesis Rock" was collected. A smaller similar rock was collected on Apollo 11 This rock is anorthosite which formed when the moon's surface was solidifying and the anorthosite floated on the surface. "Genesis Rock" is dated to 4 billion years ago. The "Genesis Rock" is believed to have been altered metamorphically at 4 Billions years and is actually older. A norite sample dated to about 4.5 billions years ago virtually the same age as the moon itself.

The Apollo 16 landing site was selected for its geological features specifically the 2 highland formations These cover 11% of the moon's near side but had not been samples by the other Apollo missions. The landing was in a 75 meter subdued old crater. A few new but many old craters surround the landing site Sampling was done near the landing site and on 3 rover expeditions. Eleven sites were sampled. Prior to the landing scientists expected the rocks at the Cauley and the Descartes formations to be volcanic in nature. Almost all of the 731 rocks, soil samples and drill cores turned out to be breccias. Some rocks at the landing site originated in the Imbrium Basin 1000 kilometers away and the Nectaris Basin 200 kilometers away. Two large anorthosite rocks were collected on Apollo 16. One of these is dated between 4.44 and 4.51 billions years almost as old as the moon itself. The solar system is dated at 4.56 billion years.

The Apollo 17 mission was significant for several reasons. It was the last of the Apollo missions and at least for the foreseeable future, the last manned lunar mission. It was the only mission to have a trained geologist as a crew member in the person of Harrison Schmitt a Harvard Phd.. It brought back 111 kgm.of material which is about a third of all moon rocks from all the Apollo missions. The landing site was a narrow valley-Taurus-Littrow-on the rim of the Serenitatis impact basin or mare. This site was selected to collect highland material older than the Imbrium impact and young volcanic material from a nearby crater less than 3 billion years old. 741 individual samples consisting of rocks and soil and cores from as deep as 3 meters below the surface were collected from 22 sites. Basalts collected at the Taurus-Littow valley contain large amounts of titanium like those from Apollo 11 and are dated at 3.7 to 3.8 billion years ago. A few low titanium basalts were found. Near the rim of Shorty crater orange soil was found that formed in a explosive eruption 3.64 billions years ago. The crater is much younger and the glass is coincidental to the crater. Very old rocks were found in the highlands that came from the lower half of the moon's crust and were brought to the surface by large meteorite impact .Norite is mostly pyroxene and Plagioclase. Troctolite is mainly plagioclase and olivine with minor pyroxene. Dunite is almost only olivine. They date to 4.2 to 4.5 billions years ago.

Collecting of moon rocks by the astronauts was no easy task. Walking on the moon's surface was difficult and time consuming especially in rough terrain. Use of the rover which moved at a maximum of 16kilometers an hour on flat surfaces increased the distances covered and number of site visited by Apollo 15, 16 and 17. The space suits worn by the astronauts prevented them from bending down or reaching their own backpacks. Tongs and rakes were used for collecting larger samples. Scoops collected soil samples. Ideally each sample was photographed in situ before being collected. Each sample was stored in a numbered bag that was put into a collection bag that was put into a storage box. Containers with special seals held the rocks till they were opened under vacuum at the Johnson Space Center. All movement on the surface of the moon was preplanned and kept on schedule by mission control which had a geologist at the space center during each moon walk. All activities on the moon walks were recorded by both video and still photography.

Moon Rocks - Continued

What do we now know about the moon from the lunar rock samples and experiments of the Apollo missions and subsequent NASA unmanned missions? There were several theories on the origin of the moon. The currently favored theory is that the earth was in a near collision with a Mars sized body. The material ejected from the earth into space formed into the moon. This material was iron poor since the iron was tied up in the molten core of the earth. Volatile elements such as sodium and potassium vaporized in the impact. Lunar rocks are similar to earth rocks being mostly basalts, anorthosites and breccias. These are low in iron and volatile elements as would be expected from the impact theory.

There is no water (perhaps at the poles), ammonia, sulfur dioxide or carbon dioxide. Early in the moon's history a magma ocean formed. The iron and magnesium silicates pyroxene and olivine formed and sank. The lighter plagioclase feldspars rose and formed the crust. All during this time 4.5-4.0 billion years ago the moon is being hit by meteorites. Between 4.0 and 3.85 billion years ago most of the major basins were formed during a period of intense bombardment. The surface of the moon has three major features: light colored highlands, dark maria and dark mantle deposits. The highlands are the result of overlapping craters from microscopic to hundreds of meters in size. The ejected debris lands on the crater rim and spreads outward. The dark mare form from lava flows that take place in some the largest craters (over 300 kilometers) called impact basins. The lava or mare basalts formed after the craters up to a billion years later. Most of the maria formed between 3.7 to 2.5 billion years ago. Mare basins show 5% of the number of craters as on the highlands. This would be expected by their younger age. The dark mantle deposits are example of explosive volcanic activity on the moon. The orange glass found by Apollo 17 is an example. Moon rocks are all ancient compared to earth rocks. No wind, water or plate tectonic activity alters moon rocks. There are no sedimentary rocks on the moon. The highland rocks give scientist a look into a very ancient world (4.5-4.0 billion years ago) on both the moon and earth.

Lunar meteorites are another source of lunar rocks. Impacts on the moon's surface hurl debris into space some of which travels toward the earth. This may take a few hundreds of thousands of years or less or up to millions of years. Isotope analysis can create a time frame for this journey and help identify the rock as a lunar meteorite. The first meteorite identified as lunar was in 1981 but the first one collected was in 1979. Meteorites in general are rare. Lunar meteorites occur once in every 700 meteorites. Most are found in Antarctica, NW Africa, Oman and Australia. None have been found in N or S America or Europe. Lunar meteorites look like earth rocks especially if weathered. Most lunar meteorites weigh between 1 and 9 ounces. The largest is 30 pounds and the smallest is .8 gram. Those from Antarctica were collected by scientific expeditions. Those from the deserts of Oman and NW Africa are found by locals or by collectors. Rocks in these areas stand out making meteorites easier to see. Lunar meteorites can be distinguished from other rocks by several characteristics. Most meteorites form a fusion crust of glassy material that melted as they speed through space. Some lunar meteorites have a vesicular fusion crust. This type of fusion crust only occurs on lunar meteorites. Mineral composition is another help in identifying moon material. Four minerals form 98 to 99% of the crystalline crust: plagioclase feldspar, pyroxene, olivine and ilmenite. The remaining is largely potassium feldspar, oxides minerals like chromite, pleonaste and rutile, calcium phosphates, zircon, troilite and iron metal. Tranquillityite and armalcolite were originally described from moon rocks but later were found in terrestrial rocks. Anorthite is common in highland moon rocks but rare in terrestrial rocks. Some common terrestrial minerals are rare or absent from the moon.

Moon Rocks - Continued

These include quartz, calcite, magnetite, hematite, mica, amphiboles and most sulfides. Most lunar rocks are breccias as would be expected on a surface bombarded for eons. This is also true for lunar meteorites. Pinpointing the area of the moon from which a meteorite came is impossible. One lunar meteorite Sayh al Uhaymir 169 has a fascinating story. 3.9 billion years ago it was melted in a giant impact that created the Imbrium basin. It was gradually buried during the next billion years. 2.8 billion years ago the rock was exposed by another impact. 200 million years ago it was sent flying across the surface by a third impact. 340,000 years ago the fourth impact sent the rock into space where it stayed till it landed in Oman 10,000 years ago before being collected in 2000 A.D. Comparison of this rock with the Apollo moon rocks allowed the locating of its origin.

Lunar meteorites that are collected by private parties can be offered for sale. Numerous web sites do just that. Lunar meteorites do not come cheap. Carat for carat, they are as expensive as good diamonds. One site listed a complete meteorite for only \$20,000. Parts of known lunar meteorites sell in the \$100 to \$200 range for pieces that may be only fractions of a gram in weight and mm in size. Reputable dealers provide documentation as to where and when found, who analyzed it and the results and exact measurements.

Apollo moon rocks are the property of the government and are considered a national treasure. A small number of samples have been distributed. Legislation proposed in 2000 awarded each of the 32 Apollo astronauts or their survivors a 1 gram sample which could be passed to heirs. If no heir exists the sample reverts to the U.S. Lucite encased moon dust from Apollo 11 was distributed to various foreign governments and U.S. governors totaling 192 specimens. The "Goodwill Rock" collected by Harrison Schmitt on Apollo 17 was dedicated to the children of the world and made into plaques for 135 countries. 3 samples of lunar rock can actually be touched. These are located in the Air and Space Museum at the Smithsonian in Washington, the Space Center in Houston and at a museum in Mexico. In the Chicago area a moon rock from Apollo 15 is on display at the Planetarium and from Apollo 17 at the Museum of Science and Industry.

Moon rocks have been offered for sale both legally and illegally. In 1993 Sotheby's auctioned 3 seed size bits of moon rock in a magnifying slide from the Soviet Luna 16 probe. These were given to the wife of a Soviet Space program director. The slide was auctioned for \$442,500. A California auction house offered some dust for sale in the same year. A few embroidered patches from James Irwin's space suit with moon dust on them were sold for \$350,000. Florian Noller, a space memorabilia dealer from Germany purchased at auction a temporary storage bag (laundry bag) that had been returned to a company by NASA. Inside were found dirty patches. Clear tape was applied to the patches. These were sold as small squares with dust for \$2500.

You can also invest in Applied Space Resources which wants to send a robotic probe to the moon to return 30 pounds of moon rocks valued at \$4.5 million a pound.

In 1998 federal agents seized a plaque with lunar rock given to Honduras and later sold by a retired military person to a Florida man who offered it for sale for \$5 million. It was returned to Honduras in 2003. The "Goodwill Rocks" of many countries are believed lost, stolen or poorly

Moon Rocks - Continued

secured. In 2002 four people were arrested for the theft of a 600 lbs. safe containing 10 ounces of lunar samples from every Apollo mission and a Martian meteorite with possible microorganisms. Three were student interns at the Johnson Space Center. They sent e-mails to the Mineralogical Club of Antwerp and to one of the members offering moon rocks for sale. The member contacted the FBI. The samples have been returned. All were sentenced to either jail or probation.

Much can still be learned from moon rocks. They certainly are valuable. We can all view them with a trip to a local museum. Several websites were especially valuable in researching this project. NASA and the Lunar and Planetary Institute sites provided information on the Apollo missions and lunar samples. The NASA JSC history portal site contains video made during the Apollo missions. The Washington University in St. Louis site on Lunar Meteorites by Randy Korotev is very helpful.

Submitted by Kathy Dedina

Mineral Micromounts Study Group; March 2008

ESCONI Member Dan Behnke, Micromounter Hall Of Fame and Mineralogical Record Photographer, gave a presentation, "A Selection of My Favorites". He covered the photographs of microminerals that he thinks are "the best". It includes images of specimens not only from his collection which now numbers over 15,000 micros but also from collections of other micromounters and museums such as the Smithsonian and Harvard. Many of these pictures have been printed in Mineralogical Record and are considered the standard. He will be giving this presentation at the May General meeting.

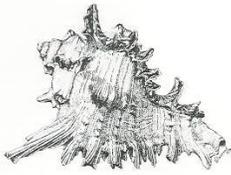
ESCONI Field Trips



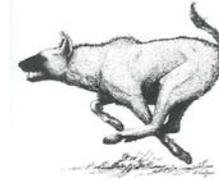
MAPS Fossil EXPO



Collecting at Jacob Geodes



Karen's Kommentare



Human DNA Found in Oregon Caves Dated to 14,000 Years Ago



This new evidence is from human feces found in caves that predated Clovis sites by 1,000 years. They have not found many artifacts in the caves indicating that the people may have been transient. Only one hand tool has been found. But there were bones of squirrels, bison hair, fish scales, protein from birds and dogs and plant remains including grass and sunflowers. The oldest of the coprolites has been dated to 14,340 calendar years ago. This appears to be the oldest human DNA found in North America so far. The photo is of

the human feces found in the Paisley Cave. (Jenkins et al in **Science**)

New Marine Crocodile from Brazil – *Guarinisuchus*



This 62 MY old fossil was found in the northeastern state of Pernambuco in Brazil and has been named *Guarinisuchus munizi* after the Tupi Indian word "Guarani" which means warrior and "munizi" in honor of the Brazilian paleontologist Deraldo da Costa Barros Muniz. They have the skull, the jaw bone and vertebrae of the fossil and estimate that it was about 10 feet long. It is most similar to marine crocodyliforms found in Africa suggesting that the group originated there and migrated to South America and then spread into the waters off North America. (Kellner et al in **Proc Roy Soc B**)

Oldest Human Jawbone Found in Spain – 1.3 MY Old



A piece of a jawbone (2 in.) was unearthed in a cave at Atapuerca Spain last year along with animal bones and stone tools. It has been dated to 1.3 MYA. This is earlier by 500,000 years than the remains found in 1997 at the same location but different site that have been given the name of *Homo antecessor* or Pioneer Man. It has been thought that this was the common ancestor to Neanderthals and modern humans. This new fossil appears to be the same species.

There are also similarities to fossils found in the Caucasus at Dmanisi in Georgia which have been dated at 1.8 MYA. This would mean that Europe was occupied earlier than previously thought. Three methods were used to date the new

site. However, the pieces of jaw from the new fossil and from the previous fossils is not the same and therefore calling them the same species may be provisional according to some. (Carbonell et al in **Nature**)

Therizinosaur Eggs Found in China

Dinosaur embryos found in the eggs have been identified as therizinosaurs from the Upper Cretaceous in China. They are in the final third of their development and based on their features they are probably closest to one of two Chinese species – *Neimongosaurus yangi* or *Erliaosaurus bellamanus*. They have identified teeth with fan shaped crowns, with a few marginal cusps, a humerus with a massive deltopectoral crest, strongly curved hypertrophied manual unguals tapering to sharpened points, and low cervical neural spines. Many of the bones are already fused suggesting advanced precociality of the embryos. (Kundrat et al in **Acta Zoologica** 88)

New Early Primate Found In North America – *Teilhardina*



This little guy was found where they were digging a Wal-Mart parking lot in Mississippi near the Red Hot Truck Stop. The fossil is tiny weighing less than an ounce with a long tail. It would have spent time in the trees and would have eaten insects and sap. It is dated to 55.8 MYA and has been named *Teilhardina magnoliana*. Chris Beard of the Carnegie Museum of Natural History in Pittsburgh discovered the fossil near a streambed in Meridian Mississippi. He believes that the animals came to America by way of the Beringia connection from Russia to Alaska. Others are questioning his argument. The other oldest primates in North America have been found in Wyoming. Others have been found in Belgium and Asia, leading some to think that they migrated here from Europe. However, Beard thinks that the Wyoming fossils are younger than the Belgium fossils meaning that the primates were in Europe before North America. He has been dating soil samples from the fossil sites. He still needs to date the Mississippi site. (drawing by Mark Klingler) (Beard et al in **Proc Natl Acad Sci**)

New Plesiosaur from Alberta Canada – *Nichollisia*



This fossil was dug up from the Alberta oil sands 14 years ago and has been named *Nichollisia borealis* after Elizabeth Nicholls. It is a 75 foot long nearly complete fossil of a marine reptile. It is dated to 112 MYA in the Cretaceous and it lived in the Western Interior Seaway. It is only missing the left forelimb and shoulder blade. It is on view at the Royal Tyrrell Museum in Drumheller. (**Palaeontographica Abteilung A**)

Karen Nordquist, Paleontology

Burpee Museum PaleoFest 2008 is a Success



It was the 10th anniversary for the Burpee Museum and they brought in some of the top experts to share their knowledge on dinosaurs and other areas of expertise over two days of intense talks on March 1 and 2. Three of the speakers were sponsored by our club ESCONI – Jim Kirkland, Jean-Bernard Caron and Phil Currie, all pictured at left. It was a busy and interesting weekend and here are some of the highlights of the talks.

Phil Currie of the University of Alberta in Canada gave two talks one on the theropods of China and one on the theropods of Argentina. His experiences in both parts of the world were interesting with stories of the growing number of dinosaur museums in those parts of the world especially in China. They will need them to house all the dinosaurs that they are finding there. He has worked on *Monolophosaurus jiangi* with its single crest on the nasal bone that may be related to allosaurids. *Dilophosaurus* is still being studied and a new specimen that is pretty complete may help to determine its relationship to *Syntarsus*. In Patagonia in South America he has tried to understand the theropod story as *Giganotosaurus* grew to be about the same size as *T. rex* but his brain was about 75% as big. By his smaller sharper teeth he ate different prey. And there were other large theropods – *Mapusaurus* and *Tyrannotitan* and others – it was an interesting place in the Cretaceous.

Phil's wife, **Eva Koppelhus** also at the University of Alberta spoke about the Fossil plants and spores of the Upper Cretaceous in Dinosaur Park Formation of Alberta Canada. Her study covered the three major Formations – Bear Paw, Dinosaur Park and Old Man. She looked at pollen and spores, mega plant and fossil wood material as part of the project. She found over 500 plants including 17 flowering plants and 100 of uncertain identity. These included mosses, club mosses, ferns, water ferns, climbing mosses cycads, pines, cypresses, and more. In addition, there were tree trunks, stems and branches, needles, cones (preserved in 3D, in ironstone and sandstone), and seeds. In summary, she found 500 species from spores, 9 different genera of conifers and 12 different families of flowering plants.

Matthew Bonnan from Western Illinois University gave a lively presentation explaining how sauropods got so big. Dinosaurs began as small bipeds with hands. The bone needed to change to keep up with the weight. The prosauropod became a sauropod and went from a biped to a quadruped. Mammals use pronation to handle this problem, but dinosaurs do not cross their arm bones – the hands still face inward – the trackways show this. Reptiles elbows sprawl out to handle it. Matt believes that it occurred in stages and started in the forearm with the radius and ulna uncrossing and forming straight strong bones and then the hand formed a U-shaped base giving an overall columnar strength. Isometric growth using stilt like principles combined with long strides for less effort. And he feels that water still played an important role with the sauropods.

Peter Makovicky of the Field Museum summarized his work with raptors along with an overview on the creatures. Starting with the Archosauria tree, he discussed their diagnostic

Burpee Museum PaleoFest 2008 is a Success— Continued

traits including the distinctive dromaeosaurian pedal claw. He made the dino-bird connection very clear with details of bone structure and air sac system. His own discovery of *Buitreraptor* in South America helped to expand the range of dromaeosaurs beyond the northern hemisphere.

The invertebrates were included by **Jean-Bernard Caron** from the Royal Ontario Museum who discussed the Burgess Shale fauna of 505 MYA. He described the diversity of some 200 species that have been found at the Burgess Shale first discovered by Wolcott in 1909. Study is still continuing with a formal description of *Pikaia* due to come out in the future. The centennial will be celebrated in Banff August 4-9, 2009.

Jim Kirkland the State Paleontologist of Utah spoke of the Early Cretaceous in Utah which is all about the Morrison of 150 MYA. The Cedar Mountain Formation has 3 or 4 levels of dino fauna with quarries full of bones like *Utahraptor*, *Falcarius* (therizinosaur), *Gastonia* (ankylosaur), and many more.

Jack Horner of the Museum of the Rockies took a different route this time and decided to be a lumper instead of a splitter. He has been looking at growth series especially among *Triceratops* and its relatives and sees that they change a lot as they grow. He also looked at the modern Cassowary and used it as an example. As a result he believes that the skull called *Dracorex* and *Stygimoloch* represent juvenile growth stages of *Pachycephalosaurus*. It is for others to disprove him at this point he says.

John Foster of the Museum of Western Colorado spoke about the Mygatt-Moore Quarry in western Colorado. This quarry in the Brush Basin Member of the Morrison Formation was found in 1981 by Pete Mygatt and J.D.Moore and some 4,000 dinosaur bones have come out of it since then. They are mostly *Allosaurus*, *Apatosaurus* with a few *Camarosaurus*. They are not articulated.

Robert Reisz of the University of Toronto at Mississauga discussed the Lower Permian terrestrial vertebrates from the Dolese Quarry in Oklahoma. During their work on the bones and articulated skeletons found in these cave deposits they have increased the number of known salamanders and reptiles, but the surprising find was that this upland site appears to have more reptiles than amphibians which is the opposite of the lowlands.



Chris Bennett of Fort Hays University of Kansas spoke on the dragons of the air and new information on pterosaur wings and muscles. He offered a hypothetical scenario for the evolution of the pterosaur wing starting with five digits with the formation of a small patagium to help a gliding Draco. The patagium would then expand to digit IV and digit V would become smaller and eventually be lost. Digit IV would elongate and the hand would turn in. The digit IV would hyperextend and the claw on digit IV would be lost.

Josh Matthews and **Scott Williams** of the Burpee Museum ended the day with their stories about Homer (left) and field stories with the Burpee Museum. Homer is from what may be the first *Triceratops* bone bed ever found with bones from at least three animals. They have quite a bit of Homer's skeleton and hope to find more of the others in future trips.

ESCONI did have a table at PaleoFest and talked to many people, accepted some new memberships and sold some of our new Mazon Creek plant books.

Karen Nordquist, Paleontology

ESCONI Gem, Mineral and Fossil Show

The ESCONI Gem, Mineral and Fossil Show at the College of Dupage on March 15 and 16 co-chaired by Floyd and Betsy Rogers was a great success. Special thanks to Eric Gyllenhaal, Joe Kubal, Nikki Dahlin and the Fairchild family for the running the ESCONI Juniors. Also thanks to Rob Sula, Floyd Rogers and Bruce Nordstrum for running the geode splitter.



Joe Kubal and Eric Gyllenhall at the ESCONI Juniors



Rob Sula helping split geodes



Grab Bag at the ESCONI Juniors



Fabulous Door Prizes

Local Calendar of Events

BURPEE MUSEUM EVENTS

Saturday, May 10 1 – 2.30 pm Burpee Explorers – Fascinating Frogs

NEW! A hands-on workshop program for children ages 6 – 10.

What makes frogs special? Why are they important? What was the Age of Amphibians like? Explore the ancient giant Amphibians like Eryops found in Burpee's Coal Forest. To discover how frogs are different from reptiles, participants will dissect a frog and take home lots of cool supplementary materials.

Must be accompanied by an adult to assist with dissection. Pre-registration and payment required. Members: \$15 per participant, Non members: \$20 per participant.

2008 Family Fossil Field Trips:

Join us on a fossil-hunting field trip! Enjoy a day prospecting for fossils in a local quarry with Burpee Museum paleontologists. You get to keep what you find. All ages and skill levels welcome.

All Family Fossil Field Trips (FFFT) are on Saturdays from 1:00-4:00pm

COST: \$8/members \$12/non-members

Pre-payment is required. We will send you directions and site specific information about one week before the FFFT you register for.

Museum members registration is open now.

2008 Dates are as follows:

Sat, April 12 will be at Lone Star Quarry in Oglesby, IL

Sat, April 26 will be at St Mary's Quarry in Dixon, IL

Sat, May 17 will be at Trask Bridge Quarry in Winnebago County

Sat, June 21 will be at Stateline Quarry in S. Beloit, IL

Lizzadro Museum

The Twelfth Annual Museum Day in Elmhurst allows visitors to see all four of Elmhurst's museums FREE! Each museum has great exhibits and activities for family and friends. Pick up a Museum Day Flyer at any of the four museums or public library. While visiting each museum have your flyer stamped. Drop off your completed flyer at the last Museum you visit and be eligible to win great prizes. Ride the free trolley between the museums.

At the Lizzadro Museum see a special exhibit of Stone Sculptures by Illinois artist Walter Arnold. Several mythological creatures on display are reminiscent of characters from Harry Potter and Lord of the Rings. Mr. Arnold specializes in architectural stone sculpturing using limestone and marble, 20 pieces represent gargoyles, and fanciful creatures carved from stone. On Museum Day children can create a stone picture frame or rock critter to take home.

May 4 "Stone Sculpting Demonstration"

Walter Arnold will demonstrate stone sculpturing using limestone on Sunday, May 4, 1p.m. to 4p.m. at the Museum. Free

Master craftsman, Walter Arnold sculpts limestone and marble into intricate works of art. He specializes in gargoyles, ornate fireplaces and portraits. See Mr. Arnold sculpt for a limited time at "Art in the Park." Learn the tools and techniques a stone sculptor uses and see how a stone creation emerges. This event will take place in the lower level of the Lizzadro Museum.

THE FACETER'S ARE COMING!

The Midwest Faceter's Guild will be holding their 20th annual Faceters Seminar on August 15, 16 & 17th at Elmhurst College in Elmhurst, Illinois.

The WSLC will be assisting the Guild in organizing the classes, with accommodations, and events surrounding the seminar, including the banquet that will be held on Saturday night. Classes will be available for beginner, intermediate and advanced. Those taking the advanced classes will be required to bring their own faceting machine. The classes are very reasonably priced and are a great way to test out the hobby to see if it is for you prior to buying expensive equipment or taking expensive classes. A detailed brochure and more information will be forthcoming. Their website is: www.midwestfacetersguild.org

LAPIDARY SCHOOL OF WEST SUBURBAN LAPIDARY CLUB

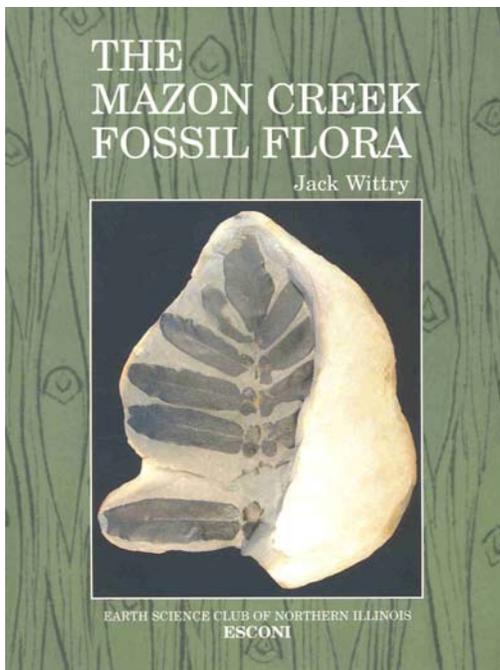
WSLC is offering a second session of classes in conjunction with the Elmhurst Park District.

They are held at: Crestview Park - 245 E Crestview Ave - Elmhurst, IL. Classes offered are:

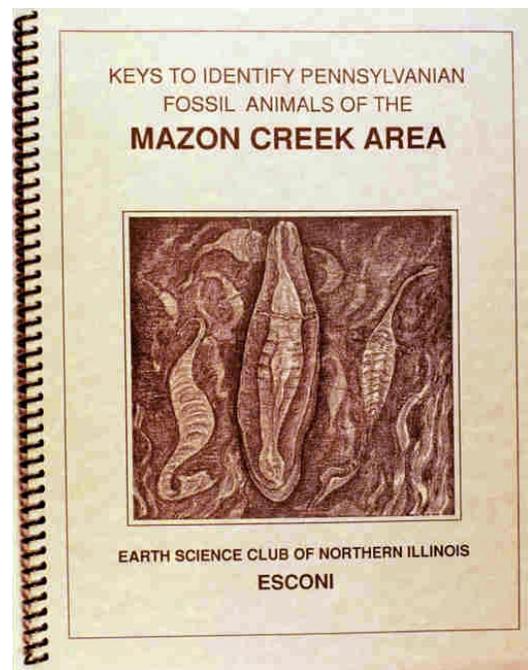
Silversmithing: Mondays 2nd session: May 5 to June 9

Cutting and Polishing Stones: Tuesdays 2nd session: May 6 to June 3

Prices and class descriptions can be found at the Park District's website: www.epd.org or by calling the Wagner Center at (630) 993-8901



**ESCONI
Books**



The Mazon Creek Fossil Flora by Jack Wittry

313 color pictures, 113 taxa, 145 drawings

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Keys to Identify Pennsylvanian Fossil Animal of the Mazon Creek Area

125 Pages, 212 Black and White Drawings

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esconibooks@aol.com

2008

32nd ANNUAL SHOW



2008

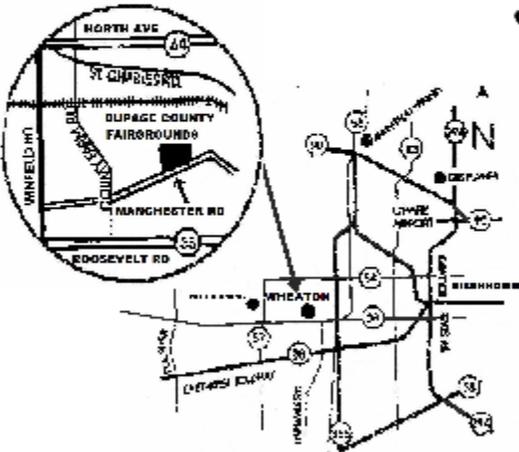
Chicagoland Gems & Minerals Association (CGMA)

BEADS - CRYSTALS - GEMS JEWELRY - FOSSILS - MINERALS

Save The Date!

Memorial Day Weekend
Saturday, May 24, 2008 10 AM - 6 PM
Sunday, May 25, 2008 10 AM - 5 PM

Dupage County Fairgrounds
2015 W. Manchester Road
Wheaton, IL



20+ Nationally Known Dealers: Details on Back

Demonstrations: Details on Back

Exhibits:

Silent Auctions:

Children's Activities:

Adults - \$5.00
Seniors - \$3.00
Students - \$3.00
Children (Under 13) - FREE!
Service Personnel w/ID - FREE!

FREE PARKING
INDOORS - AIR CONDITIONED - FOOD AVAILABLE
CAMPING AVAILABLE

For More Information: CALL 630-377-0197 EMAIL cgma@sbcglobal.net WEBSITE www.chicagolandgemshow.org

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2008

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2008

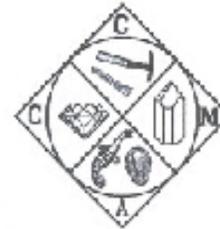
Chicagoland Gems & Minerals Association (CGMA)

20+ Nationally Known Dealers:

Barnie's Gems
Blackberry Creek Minerals
Carved Opal & Obsidian
Caveny Creations
Costigan's Minerals
The Crystal Circle, LLC
Eagle Lapidary
Exclusive Inspirations
Geodon
J.C. Pearls
John Be Crystals
The Jewelry Shoppe
Lavin's Gems & Jewelry
Mexican Amber
Mineral Miner
Moorehead Enterprises
Rib River Fossils
Russell's Trees & Treasures
Schooler's Minerals & Fossils
Silverdown
Ruth Ann's Southwest Treasures
Zoological Research Service

Faceted Stones
Minerals
Opal & Obsidian
Findings
Minerals
Minerals
Cabochons
Jewelry
General, Carvings, Faceted Stones
Pearls
Crystals

Gems & Jewelry
Amber
Minerals & Air Plants
Tools & Equipment
Fossils
Trees & Beads
Minerals & Fossils
Jewelry
Indian & Turquoise
Fossils



CGMA MEMBER CLUBS

C.G.M.S.
Cateret Gem & Mineral Society

C.R.M.S.
Chicago Rocks & Minerals Society
PH: (708) 793-7519

D.P.V.G.S.
Des Plaines Valley Geological Society
PH: (847) 293-4853

D.R.C.
Cuneled Rock Club

E.R.A.M.S.
Egan Rock & Mineral Society
PH: (847) 742-8244

E.S.C.O.N.I.
Earth Science Club of Northern Illinois
PH: (830) 420-4238

F.V.R.M.S.
Fox Valley Rock & Mineral Society
PH: (830) 896-7113

G.O.L.D.
Greater Oak Lawn Diggers

S.S.E.S.C.
South Suburban Earth Science Club
PH: (708) 747-3636

W.S.L.C.
West Suburban Lapidary Club
PH: (847) 371-8387

Demonstrations:

Opal Cutting
Polishing
Wax Casting
Silver Smithing
Cabochons
Dichroic Glass Fusing
Cutting Star Stones
Jewelry Design
Mineral Identification
Mounting Gems
Fossil Cleaning
Cameo Carving
Beading Design
Beads & Agate Forms
Wing Ming Trees
Rock Painting
Wire Wrapping
Plaster Fossil Casts
Gem Trees & Eggs

Exhibits: Crystals, Fossils, Minerals, & Lapidary

Silent Auctions:

Children's Activities: in the "Kids Korner"

2008 ESCONI CALENDAR

Revised 4/06/08

GROUP	GENR'L MGTS.	MICRO Mineral	PALEO	ARCH	BOARD	JUNIOR
January	11	12	19	26	25	
February	8	9	16	23	22	
March	15-16 SHOW	8	X	22	28	
April	11	12	19	26	25	
May	9	10	17	24	30	
June	13	14	X	X	X	
July	X	X	X	X	X	
August	X	X	X	X	22	
September	12	13	20	27	26	
October	10 ?	11	18	25	24	
November	14	8	15	22	X	
December	7 HOLIDAY	6	X	X	X	
DAY	2 nd FRI	2 nd SAT	3 rd SAT	4 th SAT	4 th FRI	2 nd FRI
TIME	8:00	7:30	7:30	7:30	7:30	7:00

Dates are subject to change: see Bulletin.

College of DuPage (COD) Building K, Room #131 for most meetings, but note that the room number is subject to change – there will be a note posted on the entrance door.

ESCONI Show of March 15-16 was held in the **Commons Room** of Building K.

The Flea Market is under consideration.

The CGMA Show will beheld at the Dupage County Fairgrounds on May 24 & 25; note the flyers and announcements.

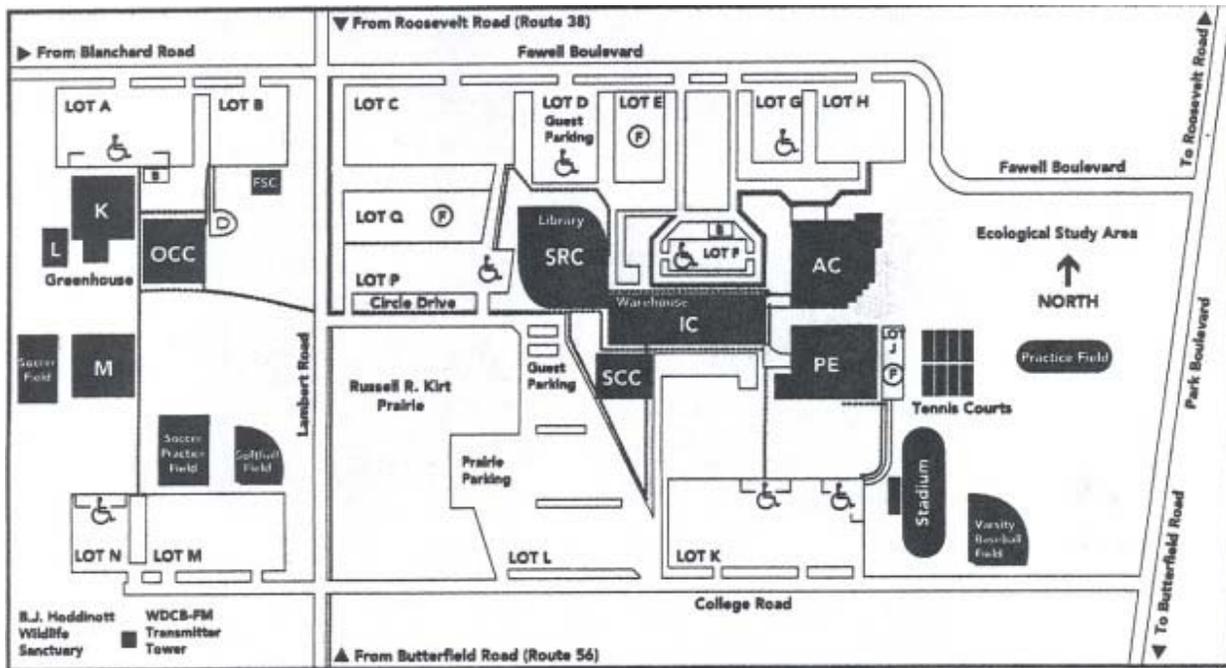
No scheduled meetings for Lapidary; contact Don Cronauer for information. (Lapidary may meet in Room #162, Arts Center if there is sufficient interest)

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E.S.C.O.N.I. Meetings Held In Building K Room 131



**SEND EXCHANGE BULLETINS TO
Don Cronauer; 6S180 Cape Road; Naperville, IL 60540**