

Ozark Earth Science Gem, Mineral & Fossil Club

A Member of the AFMS and MWF of Mineral Societies

March, 2008

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OBJECTS: To study and promote an interest in the earth sciences; Geology, paleontology, mineralogy, archaeology and the lapidary arts.

MEETING: Every second Tuesday of each month at 7:00 p.m. In the El Chico Restaurant located at the corner of Charles Blackburn Dr. and Hwy. 412/62 By-pass, in Mountain Home, Arkansas.

DUES: Active adults, @12.00 per year or family membership of \$20.00 per year. Junior membership is \$4.00 per year. Nonresident membership is \$8.00. Subscription is \$5.00 per year.

ARTICLES: for the bulletin must be in no later than the third Friday of each month.

Presidents Message Sharon Waddell

I've written this message several times in my head - while driving, while at school, etc and it sounded good. Ha! Now that I actually have a pen in my hand, my mind is empty. How does one start - with New Year resolution (**guess again, they never last**), words of wisdom (**not today!**), or just take the plunge? Our club is in the midst of major changes - new officers, new meeting location, and two shows this year, a new web site, and electronic bulletins.

At the January meeting the members present approved the below changes. We will now be meeting at the **El Chico Restaurant**, (located between Lowe's and Home Depot off the 412/62 by-pass in Mountain Home) on the second Tuesday of each month at 7:00 p.m. (only the location has changed). There is a room off the main dining area where we will have great accommodations including a wide screen, power point, and other electronic gadgets. No longer will we have to set the room up and tear it down before we leave.

Since we haven't found the ideal

location for a full blown show, we will be doing two small shows at the Mountain Home Library. The first is on April 26 and 27. The second will be on October 18 and 19. If you are interested in setting up at the show, please let me know. We also need help with other aspects, so please volunteer. These club fund raisers can only be a success with your participation.

Within the next month, we hope to have a web site up and running. We hope to save money by putting the bulletin online and not have to mail copies, except to those of us who still live in the Middle Ages (me) who will receive a hard copy. You can access the bulletin by going to www.OzarkEarthScience.org. It will no longer be mailed except to those who do not have e-mail, or unless you pay a subscription of \$5.00 per year. January is not a month we think about doing a lot of rock hunting, but several junior members have been out and about and brought examples of their finds for **Show and Tell**. **Audrey Bebout** and her brothers, **Forrest** and **Hunter**, brought in quartz and dolomite specimens with interesting formations. These were collected in a road cut on the

way to the meeting. **Ida Meyer** came in with two different chert specimens, one banded, the other a chocolate brown. She also had a quartz and sandstone formation she had picked up. **Way to go!** Not to be outdone, member **Steve Smith** brought in a fossil specimen of cephalopods and brachiopods he found while hiking.

Our **Show and Tell** for this month will concentrate on metamorphic specimens as will the club's program.

**The Minutes of the January 14
Meeting
Brenda Johnson, acting Secretary**

The meeting was called to order at 7:12 p.m. by President Sharon Waddell. There were two guests present: **Lynn** and **Katlyn Willet**. Door prizes were drawn with **Forrest** and **Audrey Bebout**, and **Aradasa Johnson** winning and **Ida Meyer** and **Aradasa Johnson** taking the auctioned items, a large specimen of beautiful amethyst and a wire African jade tree, donated by **Edward Hakesley** and **Sharon Waddell**.

There were no minutes published in the January bulletin and the Secretary was absent due to illness, so the minutes of the January Executive meeting or the regular meeting were not read and approved.

The program, **The Rock Cycle**, a MWF video, was presented by **Edward Hakesley**.

Treasurer **Dorothy Hess** reported a balance of \$1,036.53 in the account as of January 8, 2008.

President **Sharon Waddell** gave the Vice President, **Edward Hakesley**, the floor. He reported on the Executive meeting that was held on December 22, at the El Chico restaurant. He told of the

multimedia accommodations; overhead projector, and the two room areas, etc., and that there would be a charge of \$25.00 for refreshments paid to the restaurant, if the club began using it as a meeting place. It was proposed that two or three people go together on the cost (\$12.50 per person for two), with the club picking up the remainder of the balance of the money for the cost of the meeting room by those who want to eat out (arriving at 5:30 p.m. for dinner prior to the meeting). This would accumulate the \$50.00 per month for the rental. A motion was made by **Harry Meyer** and seconded by **Harvey Johnson** that we begin meeting at the restaurant beginning with the February meeting. It was carried with no opposition by the members present.

President **Sharon Waddell** announced that we will have two club shows this year at the Baxter County Library. The first will be on April 26 and 27, and the second on October 18 and 19. All club members were urged to help with preparations in some manner. She also asked that members be looking for an area that will accommodate a larger show.

Vice President **Edward Hakesley** informed members of the new webpage that is in the making. There will be a one time set up fee of \$75.00 with a \$35.00 per year fee for maintaining the domain, and \$29.95 per month rental from the club. **Buddy Bebout** made a motion that we go ahead with the webpage and **Kurt Schmitt** seconded the motion. It was explained that the bulletin will be posted on the site for members who have computers and those who do not will be mailed a hard copy. There will also be a few hard copies printed for hand outs and for club shows.

Sharon Waddell announced that Syndi Davis, who was not in attendance, had offered to head the junior members in a meeting separate to the adults on the same

evening of regular meetings.

Ed Hakesley proposed that we begin having an annual contest for the best specimen collected in Arkansas, the Midwest, and outside of the Midwest. It was also proposed that this be our program for January each year. **Harvey Johnson** made a motion that the club does this, and Harry Meyer seconded the motion.

Show and Tell, headed by **Harvey Johnson**, was then taken up with **Ida Meyer, Steve Smith and Sharon Waddell** talking about the specimens they had brought in.

The meeting was dismissed at 8:25 p.m. with all enjoying refreshments brought in by **Sidney and Aradasa Johnson**.

Do You Know What to Do in case of a Heart Attack?

By Chuck McKie, CFMS Safety Chair 2001 via Aradasa Johnson, club safety

Cardiac Chain of Survival
<http://www.cfmsinc.org/>

Cardiovascular disease is one of the most common causes of death for all ages. Would you know what to do if a loved one or co-worker were to suffer a heart attack? Learning how and being prepared to use CPR is an excellent beginning. However, CPR is only one of the links in what is known as the Cardiac Chain of Survival. The links in the cardiac chain of survival include:

Early Recognition and Early Access. The sooner 911 or your local emergency number is called; the sooner early advanced life support arrives.

Early CPR. Early CPR helps circulate blood that contains oxygen to the vital organs until an Automated External Defibrillator (AED) is ready for use or advanced medical personnel arrive.

Early Defibrillation. Most victims of sudden cardiac arrest need an electric shock called defibrillation to restore the heart to a regular rhythm. Each minute that defibrillation is delayed reduces the victim's chance of survival by about 10 percent.

Early Advanced Life Support. This is given by trained medical personnel who provide further care and transport to hospital facilities. Almost a third of the deaths from sudden cardiac arrest could have been prevented if an AED had been available for immediate use at the time of the emergency.

By following the links in the Cardiac Chain of Survival you can increase the victim's chances of survival. To learn more about Adult CPR/AED Training, the American Red Cross and first aid programs, or our health and safety services programs, contact your local Red Cross chapter, or American College of Emergency Physicians Chain of Survival Home Page via the Red Cross on the internet.

Cardiac Arrest

Sign up for an American Red Cross CPR course. Consider these sobering facts: Seventy-five percent of all out-of-hospital cardiac arrests occur in the home. About 1.25 million people experience a heart attack in the U.S. each year; 500,000 of these attacks result in death. About 250,000 deaths (that's 20%) occur within the first hour of the onset of symptoms. More than 160,000 deaths occur before the age of 65. An emergency with an infant or child (aged 0 - 8) is more likely to involve a

breathing problem. To learn more about American Red Cross CPR, please contact your local Red Cross chapter.

Choking

Did you know that more than 2,800 people die each year as a result of choking? This is the time of the year when many families and friends get together for large meals and good times. Would you be able to recognize if a family member or friend started to choke? Do you know what activities might lead to choking? Here are some common causes of choking:

Trying to swallow large pieces of poorly chewed food.

Drinking alcohol before or during meals. Alcohol dulls the nerves that aid in swallowing.

Wearing dentures.

Dentures make it difficult to sense whether food is fully chewed before it is swallowed. Eating while talking excitedly or laughing. Eating too fast. Walking, playing, or running with food or objects in the mouth.

These are just some of the causes of choking. If you want to learn more about the signals of choking or the care needed to give to a person who is choking, sign up for a CPR course. Contact your local Red Cross chapter for a schedule of courses in your area.

Alzheimer's Risk Factors

Here is yet another reason (besides protecting your heart) to control your blood pressure and cholesterol. A study of more than 1,400 people published in the June 16, 2001 issue of the British Medical Journal concluded that those with high cholesterol or

blood pressure in middle age had greater than double the risk of developing Alzheimer's disease when compared to people with normal blood pressure and cholesterol. Your physician can help you lower your blood pressure and cholesterol.

(Editors Note)

The Mine Safety course that some of us have taken that is given at the Department of Labor in Little Rock, AR, covers not only all the above, but also teaches safety aspects needed on fieldtrips. I highly suggest that everyone try to take this course soon and get certified.

Some Internet Links for juniors

www.sdnhm.org/kids/minerals/

www.msha.gov/kids/mphp.htm

www.fi.edu/fellows/payton/rocks/index2.html

www.fi.edu/tfi/units/rocks/

www.rocksforkids.com

A Recap of Last Month's Program

Last month's program was on *The Rock Cycle*. It was a very informative and interesting video on how the earth was formed gradually by the breaking down of rocks and how it began and continues until this day from the igneous to the sedimentary to the metamorphic phases. It was a good refresher for all the adults and something for all the juniors as an educational tool. It is one from the MWF program library, and I would highly recommend it to any club as a

program event.
Editor.

ABOUT MINERALS AND ROCKS RELATIONSHIP (By C.E. Johnson) via S.C.R.I.B.E

It is a well-known fact in the economic-geology community, that there are certain genetic relationships between some rocks with some minerals, and vice-versa. This genetic factor refers to the tendency of certain types of “intrusive” magma (molten rock) bodies to breed certain types of mineral deposits in their primary states, as the magma cools off and solidifies; for instance the magmas that create ordinary Granite family rock formations are noted for “breeding” minerals such as aquamarine & emerald, topaz, amazon-stone, tourmaline, zircon, chrysoberyl, tin-tungsten-uranium minerals, especially in very large sizes in those special bodies known as “pegmatites”. Ordinary Granites are also considered the best producers of crystallized specimens even in their usual “fissure veins” type of mineral bodies. Gold & silver are common

also (but these two minerals are also produced by other types of rock magmas).

Most of those minerals are deposited in the rock formations overlying or surrounding these magma bodies, but sometimes some of them are also retained within the magma bodies as they cool off and solidify into rock formations.

There are other examples of this “genetic” factor also in magmas that create other types of rock formations such as Gabbro, Peridotite, Rhyolite, and Basalt, all of which contain some minerals particular to their nature.

This gives us one of the more important advantages of Geologic maps, because of course; this points us to the most favorable places to explore for one or more of those particular types

of minerals. However, always be aware that other types of minerals may also exist in those same regions perhaps because of more complicated geology than what is known about there.

Of course many things happen to rocks and minerals after they are formed by the magmas. The conditions which form rock formations are known as “environments”. Their magma origin is known as an “Igneous” environment.

Those things that happen to them after their “Igneous” birth puts them in the categories known as “Metamorphic” and “Sedimentary” environments. These two environments, and the “Igneous” one, are the names of the three main classes of rock formations shown on geologic maps. Each of those three are usually sub-divided into more specific rock formations wherever they are known; to give us more specific information about their types of minerals potential.

There we have the basic value of geologic maps as our guides to favorable regions to explore, and what we can expect there. Each type of those three rock formations has its own particular suite of minerals, and geologic maps show those main types and even sub-types wherever they are known to exist. The U.S. Geological Survey is the main source of the maps.

The other “intrusive” magma bodies mentioned above are very different from the Granite-family ones in appearance and the minerals they produce. For instance, the Gabbros are noted for gemstone material Known as “labradorite”, some copper & nickel, chromium, and some varieties produce some Corundum (some varieties of which occur as the gemstones Sapphire & Ruby).

The magmas that form the igneous rock known as Peridotite are noted for Diamonds, Diopside, Garnets such as pyrope and uvarovite, some peridot-olivine, sphene, etc. Peridotite formations are also associated with ores of Chromium, Platinum, and Nickel; and with Brucite, and

some nephrite - Jade, etc.

Some Rhyolites contain Topaz & Quartz crystals and others in cavities, and Opal, Agate, Obsidian, Chalcedony, Cassiterite, and Tourmaline.

Basalt formations are noted for their cavities of crystallized materials such as Zeolites, Amethyst, Siderite, Olivine, and cavity fillings such as Agate and Opal.

There are many other examples of such relationships with other rocks and minerals, but this article cannot cover them all.

Uranium Gives Opal Its Shine

The beautiful optical properties of the gemstone opal are the result of tiny amounts of uranium present when the stones are formed, say researchers in Australia. They claim that their work could lead to the production of artificial opal and have already shown that the gamma rays given off by the uranium and its radioactive daughters can lead geologists to new underground deposits of the gem.

Opal is made of amorphous silica and this makes it very difficult to find because the gem is usually surrounded by other rocks made of the same material. "Precious" opal in that it contains spheres of silica about 200nm in diameter that are arranged in a regular superlattice. This gives the gem its famous "play of colors" -

different colors that appear when opal is viewed from different angles - which are

caused by the diffraction of light in the superlattice. Now, geologist Brian Senior and physicist Lewis Chadderton have discovered that the superlattice of spheres forms because of the presence of tiny quantities of uranium and its decay products. Using analytical techniques such as electron microscopy and neutron activation analysis along with theoretical models of sedimentation processes, the team has shown that some of the very heavy elements that are made when uranium decays act as "seeds" for the formation of the silica spheres during sedimentation.

Gamma-ray logging

The uranium also makes precious opal much more radioactive than surrounding silica-based rocks, which tend to have low levels of radioactivity. With this in mind, Senior and Chadderton have adapted a standard tool of oil exploration called gamma-ray logging to create a technique for finding precious opal. Their technique involves boring a minimum of three holes in a region where the gem is thought to occur. A sodium iodide gamma ray detector is lowered by a winch wheel drive vehicle. If high levels of gamma rays are detected, the data from the three bores are triangulated to locate the center of the deposit. The teams have used their technique to find new deposits at several locations in Australia. Senior, who runs his own consulting company, believes that the technique could be a boon to Australia's opal mining industry - which, despite producing over 90% of the world's precious opal, he describes as a "cottage industry". Chadderton, who is at the Australian National University in Canberra, says that the teams are using their insight into Opal formation to create artificial gems. As well as being used in jewelry, Chadderton believes that such opals could be engineered

to be photonic crystals. These can be used to control light in much the same way as semiconductors are used to control electrical currents - something that could make them very useful in fiber optical communications systems. Senior and Chadderton will report their results in an upcoming issue of the Australian Gemologist.

About the author: **Harmish Johnston** is the editor of <http://physicsworld.com> .

(from Rockhound Roundup, 11/07, via <http://physicsworld.com/cws/article/news/31941> , 11/22/07, and Snoop Gems, 1/08

Having Fun - Junior Activities

Darryl Powell's Diamond Dan: A Great Resource for Kid's Activities

Via AFMS Newsletter, Dec.07 - Jan. 08

Nearly a decade ago, I became familiar with a wonderful coloring book published under the name of "Diamond Dan." Entitled Minerals; Coloring Fun for Kids, it marched through the mineralogical kingdom in A, B, C fashion, introducing minerals from Agate to Zincite with eye catching graphics. At the time, I was president of the Carmel Valley Gem & Mineral Society, and we ordered a batch of these books to give to kids in our Kids Activities Booth for our show. I've since moved to Ventura, California, and I continue to order and distribute copies at the annual Ventura Gem & Mineral Society show, and they continue to be a big hit, both with kids and teachers. Then at the 2004 AFMS Show in Syracuse, New York, I had the great

privilege of meeting the creator of Diamond Dan in person: Darryl Powell, of Manchester, New York.

I had learned earlier that Darryl had expanded his line beyond the mineral book and was also offering a coloring and activity book on gold, as well as a series of "Earth Digger Clubs" mineral identification packs that rewarded kids with a patch on completing each packet. At this year's California Federation show in June, Terry McMillan of the Mother Lode Mineral Society brought along a supply of flyers showing that Diamond Dan has continued to dig up exciting new ideas and projects for kids. I reviewed them earlier this fall in the California Federation newsletter and I've been asked to review them for the American Federation newsletter, as well, so here goes:

The World of Minerals & Crystals introduces minerals from A to Z, with commentary on their physical properties, forms, and uses in everyday life. A reading/coloring section is followed by an activity section with crossword puzzles, word finds, etc., to reinforce info from the coloring section.

Corundum Carl's Great Crystal Adventure introduces kids to crystallography, or the science and study of crystals. It includes 13 crystal models that can be cut out and folded into 3-dimensional crystal shapes and a recipe for growing crystals.

Mineral Note Cards is a package containing a set of 8 full color note cards 4.25 x 5.5 inches and envelopes. The note cards have images of gold, scheelite, vivianite, fluorapatite, amethyst, rhodochrosite, benitoite, and garnet.

In the book Gold! "Nugget the Prospector" guides young readers through the world of gold: What is it? Where is it found? Why is

it so valuable? A reading/coloring section is followed by activities like crossword puzzles and word finds.

Crystal Clips V is a CD - ROM holding over 900 mineral and crystal drawings in both color and black and white in TIFF and JPEG formats.

Earth Digger Clubs involves a series of mineral - identification exercises in kits of 1-hour activities with patches and awards for kids who complete an activity. Kids learn about individual minerals such as calcite, pyrite, quartz, gypsum or fluorite, as well as about properties of minerals such as hardness, color, crystal formation, etc.

Finally, Darryl has embarked on yet another adventure extending his line of already excellent works: Mini Miners Monthly, a monthly publication for young mineral collectors. Each month, readers will find interesting articles, crossword puzzles, word searches, and hints for building a collection, cut-and-fold crystal models, and more. An annual subscription is \$19.95 (\$36.95 for two years). To get subscriptions for kids in your club, and to learn how to purchase individual or bulk quantities of Darryl's other find publications, contact Darryl Powell, Diamond Dan Publications, P.O. Box 143, Manchester, NY, 14504, (585) 289-4936, e-mail

diamonddan@rochester.rr.com. Or check his web site at www.diamonddanpublication.com. You'll be sure to find a treasure trove of resources for kids by a wonderful person who certainly knows how to educate while - as always - having fun.

(Editor's note) This would be something for our future Junior's Leader to obtain

copies of, at the club's expense, so as to have different activities for them to work on.

How Rockhounds Were Created

Author Unknown

From The Leaverite News, June, July, Aug, 2005

Via The Mountain Gem, Dec., 2007

In the beginning, when the Lord created rocks as the building blocks for the earth, the Angels of Heaven inquired, "Sir, because rocks are inert, who shall know their role in the universe? Because they are inanimate, who shall reveal their great beauty and charm? Because they are inarticulate, who shall speak for them?"

Because they are immobile, who shall take the pieces of them about for all to see?"

The Lord replied, "I shall make a special breed for the noble mission; and, thenceforth, among all others; the breed shall be known as Rockhounds." And thus it came to pass.

In the News.....a collection of articles from The Pegmatite, Dec., 2007

Diamonds and Zircons: Clues to Earth's Past

Geologists have assumed that after the formation of the Earth 4.5 billion years ago, the surface was a molten mass for the next 500 million years. Zircons from Jack Hills in Western Australia, the world's oldest at 4.3 billion years of age, are causing scientists to

think again. In 2001, researchers isolated a special oxygen isotope inside Jack Hills zircons, an isotope only produced by clay - clay that probably formed in an ocean. That seems to indicate the Earth's surface cooled about 200 million years quicker than previously thought. In April, 2007, researchers found diamonds inside Jack Hills zircons, diamonds which are usually formed when continental crusts are subducted and subjected to enormous heat and pressure. So, were plate tectonics, subduction and metamorphism already underway 4.3 million years ago? That's the question!

(Summarized from 8/22/07 Reuters article, 8/23/07 Nature, and 8/23/07 ABC News report.)

Dinosaurs: New Giant from Patagonia

Paleontologists have been poking around in northern Patagonia since 2000, and finding wonderful things: fish and leaf fossils, together with dinosaurs like *Megaraptor*. The site dates to the Cretaceous, about 80 million years ago, and enough of the ecosystem is preserved that researchers can describe a warm, humid climate with forests. The most recent find is a largely complete dinosaur skeleton, measuring about 110 feet in length, and as tall as a four - story building. Named "*Futalognkosaurus dukei*", meaning "giant chief of the lizards" and honoring Duke Energy Co. for funding a large part of the dig, it is a new species, and one of the three biggest dinosaurs found anywhere in the world.

(Summarized from 10/15/07 Reuters article on <http://news.scotsman.com>)

Deep Earth Rocks: San Andreas Fault

About 23 miles north of Paso Robles (California), scientists drilled 2.5 miles down into the San Andreas Fault and removed four inch core samples which they hope will answer the question why this section of the fault moves so gently, instead of rupturing violently. Is it the serpentine? Is it serpentine decaying into talc? Further study may tell. Scientists will next place seismometers and tiltmeters into the borehole directly above the spot that ruptures, to detect earthquakes from the place where earthquake energy accumulates.

(Summarized from <http://www.livescience.com/environment/071004-fault-ricj.html>).

Shop Tips, from Snoopy Gems, January, 2008

To make rock saws remain friction free, clean the saw blade perfectly clean and free from all oil and residue and then spray with PAM. It also works well on guides for the vise. (from Dops and Digs, 01/95)

If you need a big dop stick, try using a common old-fashioned straddle-log clothespin. They are big enough to handle and can be set over the edge of a box for storage. (From Breccia, 03/02)

Booming Sand Dunes

Booming sand dunes, which generate droning sounds that can last a minute or longer, have been found at about 30 places worldwide, including Dumont Dunes in Southern California. Their often deafening tones are typically loudest at a single frequency between 70 and 105 cycles per second. The sounds can often be heard for kilometers.

The sound originates when sand avalanches down the face of a dune. The thickness of a surface in a five foot thick dry layer of sand dictates the frequency of their tones.

Researchers measured the speed of sound in a five foot thick dry layer of sand at 200 meters per second. Below the dry layer was a moist layer where the speed of sound traveled between 300 and 360 meters per second.

The abrupt difference in speed causes the boundary between moist and dry sand to reflect sound waves and bouncing the sound of avalanching sand back and forth within the dry layer, creating a resonance that boosts the sound at the resonance frequency.

(This was excerpted by Chris Fite of the Tulsa rock club, from the periodical, *Science News*, and Sept. 8, 2007. Via the T-Town Rockhound, January, 2008

Colors in Minerals

The recognition of colors in minerals goes back to our pre-historic ancestors who used charcoal and iron oxides to color cave paintings which still retain their original intensity.

Idiochromatic minerals are “self colored” due to their composition. The color is a constant and predictable component of the mineral. Examples are blue azurite, red cinnabar and green malachite.

Allochromatic minerals are “other colored” due to trace impurities in their composition or defects in their structure. In this case, the color is a variable and unpredictable property of the mineral. Examples are the blue in amazonite (orthoclase), yellow Heliodor (spodomene) and the rose in rose quartz.

Pseudochromatic minerals are “false colored” due to tricks in light diffraction. In these cases, color is variable but a unique property of the mineral. Examples are the colors produced by precious opal and the shiller reflections of labradorite.

(From the Rockhound Record, Sept. 2007 via T-Town Rockhound, Jan. 2008)

The Sunshine Report

A.J. Johnson was ill with a form of flu earlier this month. **Sid** had to do all the cooking and cleaning while she was resting throughout her illness.

Ernie Confer & Madelyn Anderson still traveling.

Gretchen Neal reports that all of her medical tests confirmed no cancer and she is looking forward to returning to Arkansas in the spring. We look forward

to finally having her permanently with us.

SFC John Johnson spent a week with his parents, **Harvey & Brenda**, during the end of January. He will be going to Kuwait sometime in March for a 15 month tour of duty.

If you have any news you would like to appear in our Sunshine Report, please forward it to at bdwj_57@hotmail.com.

Make plans for our up coming shows that will be held on April 26 & 27 and October 18 & 19, in the recourse room at the Baxter County Library. All who are able to help out are needed in some way.

We need specimens for the door prizes and our monthly raffles. Please consider donating something that will be worthwhile to someone as an inclusion to their collections.

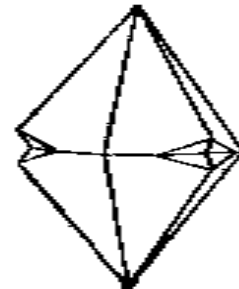
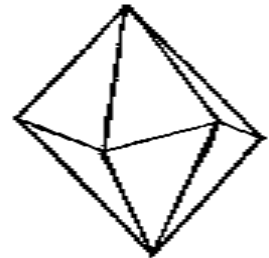
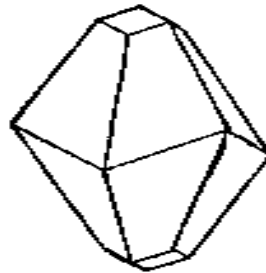
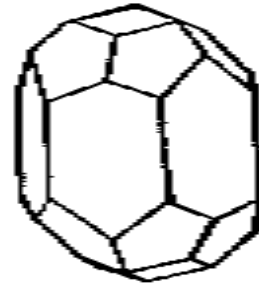
I need your e-mail address so that I can send you a reminder of when our bulletin is posted each month. Please send it to: bdwj_57@hotmail.com .

UP COMING SHOWS AND EVENTS

February

2-16 Tucson, AZ: Arizona Mineral and Fossil Show, various Tucson locations (4), Martin Sinn Expositions, L.L.C., www.mzexpos.com for more information.

Calcite Shapes



Brenda D. Johnson, Editor
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