ROCK-N-ROSE

NEWSLETTER OF THE EAST TEXAS GEM & MINERAL SOCIETY

PAGE 1 VOLUME 37 TYLER, TEXAS ISSUE 6 JUNE 2011

Coming Shows, 2011

Aug. 13 - 14
BATON ROUGE, LA
Baton Rouge G&MS
Fraternal Order of Police

Aug. 20 - 21
BOSSIER CITY, LA
Ark-La-Tex G&MS
Bossier City Civic Ctr.

Aug. 27 - 28
JASPER, TX
Pine Country G&MS
Events Ctr.

Sep. 03 - 04
ARLINGTON, TX
Arlington G&MS
Arlington Conv. Ctr.

Sep. 03 - 04
DENISON, TX
Texoma Rockhounds
Denison Senior Ctr.

INSIDE THIS ISSUE

PRESDENT'S MESSAGE

Don Campbell presented an interesting program on the ETGMS involvement in the preparation of the Herkimer County trilobytes. Lots of work involved in getting them ready for display. He estimates that there is at least another 10 years of work needed before the entire plate will be ready for display. There is a book planned to document the process. I was proud of the tone of the discussion concerning donating the Orthoceras plate to The Discovery Science Place for display along with the fluorescent minerals we donated to them last year. I am proud to tell people that I am a member of the ETGMS when they mention seeing the mineral display. One day we'll have a workshop in the Tyler area and can expand our educational activities to include classes on various lapidary disciplines. Until that time I urge you to continue with your individual educational activities in your communities (presentations to schools, workshops at the library, displays in the community, etc.). If anyone knows of a potential site for a workshop in the Tyler area, please let me know. Nothing in Tyler has worked out so far - too expensive (as in very over priced) or too many restrictions on the use of the building for a workshop. Until our next meeting - collect safely and good luck.

Rip Criss

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NOTE FROM THE EDITOR

Hello all, Don Campbell's fossil presentation at our meeting this month was very enjoyable. I wished to express my joy in receiving the awards from the SCFMS, it really surprised me. It was also very nice to meet some of our members that I had not met before. Add to that, getting more rocks from among the door prizes...you can just imagine, I was so glad I was able to make it to that meeting! SB

June 2011 Meeting Minutes

The East Texas Gem and Mineral Society monthly meeting was called to order by Club President, Rip Criss, at 6:58 p.m., June 6, 2011 at the Discovery Science Place in Tyler, TX. There were no visitors or new members in attendance

Motion to accept minutes of the May 2011 meeting as published in the Rock–N-Rose newsletter was made by Tom Stringfellow, seconded by Becky Whisenant and motion carried. Jeri Kitchens, Club Treasurer, gave the financial report.

Rip made the presentation of awards recently received from the South Central Federation to Tom Stringfellow, Destiny Clark, Becky Whisenant, Susan Burch (2) and one for Mary Owens. Susan, as editor of the newsletter, had submitted the entries.

Keith posed the question of the annual donation to the South Central Federation Scholarship Foundation, had the check been sent? He gave an outline of the scholarship program and how much it has paid out since 1965; 6 scholarships per year and totaling more than a million dollars to graduates in earth sciences fields. Jeri made a motion to donate $2 per club member from the club treasury, seconded by Penny Hawkins, motion carried.

Becky questioned if the club was going to buy a motor for Don Campbell's boat as discussed at the May club meeting. Don said that idea is dead. But he went on to give a field trip report on a recent club trip to gather fossils.

The next item brought before the members was the recent acquisition by Keith Harmon of a large slab of Moroccan Orthoceras. Following discussion about the best use of the slab, the idea was proposed to donate it to the Discovery Science Place to be used in a display case in "the cave" area. Don will approach the governing body about the feasibility of setting up the display. Colleen Hayes made the motion to repay Keith for the $200 he paid for the slab; Becky seconded the motion which was approved, with Keith casting the lone nay vote.

Following the drawings for door prizes a short break for refreshments was enjoyed .

Don Campbell presented the program which began with a history of the Walcott-Rust Quarry in Herkimer County, New York, where fossils have been found for more than 100 years. Don and club members Jeri, Colleen and Becky have been traveling to Oklahoma to work on an immense slab of trilobites from that quarry.

The official meeting was adjourned at 9:00 p.m. followed by the usual clusters of members gathering to talk about displays Don had brought for his presentation and other things that interest folks who like rocks.

Respectfully Submitted:

Penny Hawkins, Club Secretary

ENRICHMENT OF ORE DEPOSITS, OR COLDWATER REPLACEMENT
By D. W. Webb Varnum

The process of the enrichment of ore deposits is not as dynamic as the hydrothermal emplacement of primary deposits, but it is nevertheless very interesting. In general, the enrichment process is basic to deposits of all types. We will first discuss copper, silver, and gold, and we will then go on to talk about the silicification of organic material. These ore bodies were originally placed between 1 million and 150 million years ago at a level of one to ten miles below the earth's surface.

Erosion begins to remove the overburden, and in time a deposit is exposed outcropped). Quite often, this action takes place on sloping terrain, making the bodies difficult to access. If the ore body is porous, water can enter the material, where it can then concentrate. This action causes a placer deposit to form. If the amount of water and the ore deposit exist in the correct proportions, and if the mineral in the lode surrounding the rock is of the right type, the dissolved concentrate will flow to a lower level.

This process is complicated. Briefly, the water passes over iron pyrites or iron sulfides (sometimes copper) to release the sulfur, and this forms sulfuric acid. This diluted solution of sulfuric acid dissolves the copper, silver, etc. In order for this reaction to take place, ferrous sulfate and oxygen must be present.

As long as the pH is correct and other chemicals are in balance, the dissolved minerals are carried downward. At some point the chemistry changes, and the mineral is deposited as pure metal, or sulfides or sulfates. This process can occur again and again. Finally, the mineral reaches the end of the oxygenation zone, and the process comes to an end. The resulting material is generally located below the water table and can be as deep as 2,000 feet. Via Stoney Statements 5/11

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DID YOU KNOW

The longest word in the third edition of the unabridged Webster's dictionary in one we can avoid ever having to learn to spell. "Pneumonoultramioropicsilicovolcanoconiosis" is defined as the condition caused by inhaling fine silica or quartz dust. Prevent the condition, often fatal, by wearing a dust mask or having a dust removal system installed in your shop. Via Stoney Statements 5/11

ABOUT WATER AND MINERALS
By Kempton H. Roll

Water is a strange and fascinating chemical. It could be said we're living on a misnomer; that our planet should have been named "Water" instead of "Earth." In its liquid and solid form, water comprises about three-quarters (72 percent) of Earth's surface. It's the main reason why our planet is such a beautiful blue "marble" when seen from outer space. Down here, water is the chemical we depend on for survival, if not our very existence. We drink it. We cook much of our food in it; food which couldn't have grown without it. We wash ourselves, our clothes and our dishes with it. We can swim in and sail on it in the summer and skate on it in the winter. It can rain on us when it's warm or make us shovel it when it's cold. When heated sufficiently it can undergo a phase change – turning from a liquid to a gas (steam). Here in the mountains, water boils at a slightly lower temperature because the atmospheric pressure is slightly lower. In a vacuum (no pressure), water can actually "boil" at room temperature! When the pressure is increased, such as in a locomotive boiler or a pressure cooker, it takes a higher temperature to make the water boil. But it will still change phase and turn into a gas. The vapor confined causes the pressure to increase so the inside temperature can rise higher than 212 degrees. The higher the pressure, the higher the water temperature must be in order to go through its phase change. However a strange thing happens to water when both the temperature and pressure are raised above a certain point, known to mechanical engineers as its "critical point." At these extremes, water no longer undergoes a phase change from liquid to gas. It remains liquid! This phenomenon takes place at 705.4 degrees F and 3206.2 psi pressure (more than 218 atmospheres). Mechanical engineers call the resulting liquid medium "water substance" (J. Gieck, Invention & Technology, Vol. 12, 1996). It is no longer ordinary water.

Water Substance

While "water substance" is important to the mechanical engineer, it appears that it might also have a very special meaning for the geologist and mineralogist. It may help explain why, deep in the bowels of some parts of the earth where temperatures and pressures exceed the "critical point," water can still be present as a liquid. Leonard Wiener, a recently retired geologist with the NC State Geological Survey, calculates that to attain critical point pressure (3206.2 psi) water alone, without heat, would have to be at a depth of about 7,500 feet or nearly 1½ miles below the surface. Typical rock, he notes, exerts critical point pressure at a depth of roughly 2,700 feet or about ½ mile. So water confined under a rocky overburden at this depth would have reached its critical point, pressure-wise. Add heat so that the temperature of this trapped water can reach at least 705.4 degrees F, and its liquidity will be assured by the higher pressure. It now becomes "water substance." Returning to liquid water's ability to dissolve solids, every tea drinker knows that sugar dissolves

Water continued.

more easily in hot tea than in cold. This is because all chemical reactions, including dissolution are influenced by temperature: the higher the temperature, the more rapid the rate of reaction and the more solids the liquid can hold in solution. If water's ability to dissolve solids is enhanced at higher temperatures, then it makes chemical sense that water, or "water substance" to be more precise, deep down in the earth enjoys a greater capability of dissolving minerals like quartz and even metals like gold. In contrast, up on the surface that same chemical H2O, under normal temperature and atmospheric conditions, even when boiling, can at best dissolve only tiny traces of quartz, for example. A "noble" metal like gold is virtually insoluble.

Another condition that could play a role in the deep earth dissolving process is the pH factor. How acid or alkaline is this "water substance?" There are two answers: "We have no way of knowing," and "It depends on what other chemicals are present." Either way, high or low pH, more "hydrothermal" (water + heat) chemical reactions will tend to take place which would lead to the formation of more, often exceedingly complex chemical/mineral combinations. It's only when these aqueous solutions subsequently work their way up to the higher reaches, cool down and solidify (hopefully crystallize), that we can appreciate their complexity and enjoy what Mother Nature and Father Chemistry have created for us down below.

Magmatic Water

Surface water is essentially indestructible. It may not be in the right place at the right time, too much or too little, but it's always there, even if it's just in the form of clouds floating in the sky. On the Earth's surface and at temperatures higher than 212 degrees F, water simply turns to vapor and escapes into the atmosphere. It does this even at lower temperatures in the form of humidity. Too low and it returns to its original liquid state, i.e., fog and clouds, or if the air is really saturated, rain. Drop the temperature still further, and it changes phase again and becomes solid, falling as snow or hail. With all of these forms of water so readily accessible on the land, in the sky and in the rivers and oceans, if the Earth is essentially solid, how does any of this water get down to those depths where "hydrothermal" mineral formation can take place? It doesn't.

Some surface waters will work their way deep within seemingly impervious rock formations. Most mines, even the deepest, usually encounter water; however, such waters cannot possible reach "critical point" conditions. Certainly the temperature would be much too low. Instead, "water substance is literally liberated or created by chemical reaction down in the mantle itself where high temperature/high pressure reactions are constantly taking place. Bill Miller notes that such water molecules can come from OH groups or H20 in minerals (mica, amphiboles, etc.). Then, he adds, there is "juvenile" or magmatic water – "original water" – formed deep within the earth, which has a different isotopic signature than meteorological water. Some of it also originates as hydrogen and oxygen gases released through chemical reac-

tions that can recombine to form water and heat energy. While most volcanoes – "the safety valves for these sub-surface chemical reactions – spew an assortment of subterranean gases and solids out into the atmosphere; the most voluminous gas is almost always water vapor in the form of steam. This is magmatic water. It may end up as rain and drinking water, but it did not start out that way.

If not ejected violently, magmatic water formed at the extremes of pressures and temperatures encountered deep in the earth's reaction chambers will remain in the liquid state, not as ordinary water, however. It is "water substance" and as such becomes the solvent – "super solvent" – that seems capable of dissolving a far more impressive array of chemical elements and compounds (minerals) than its surface counterpart.

The great pressure encountered at these depths can force a saturated liquid substance to work its way upward, taking the nearest path of least resistance, percolating through fissures and cracks in matrix rock dislocations created by plate tectonics, or it can collect in vugs left by gas pockets. At some point, when conditions have changed from high temperature/high pressure to lower pressure and temperature, especially the latter, the above process reverses itself. What went into solution now has to come out.

Whenever any liquid is saturated – dissolved as much as it can – those solids in solution will precipitate out when the temperature drops. Rock candy crystals, for instance, begin to "grow" when a hot, saturated sugar solution cools down. In the case of subsurface saturated "water substance," if the escape action is not associated with volcanic activity, but instead the liquid remains trapped beneath rock overburden, as it nears the cooler upper regions, it will begin to "freeze" and allow the chemicals in solution to precipitate as solids. Now they turn into "minerals" for the rockhound and "ore bodies" for the miner. Minerals held in solution may ultimately precipitate out as vein deposits or interstitial deposits, and sometimes, if the rate of cooling is just right and if there is room, they form into large, multi-faceted crystals. If we rockhounds are lucky, we may someday find some of them.

While the chemical known as "water" plays a vital part in our lives, in the form of "water substance" it may be even more important because of its ability to create so many of the minerals and crystals we enjoy collecting. It is a most powerful substance; yet, strangely, one which we mortals destined to live out our lives up here on Earth's surface will never see or feel or taste, even though we drink tame versions of it every day – long after Mother Nature has finished with it down below.

From Mountain Mineral Monthly 01 & 02/97, via AFMS Bulletin Editors Articles, l998 – And This Is What They Wrote, via The Rockpile, 11/98. (It received the 2nd Place trophy in the Adult Articles category of the 1998 AFMS Contest.)Via Stoney Statements 5/11

The Story of Montana Agates

It has always been a mystery how the peculiar little scenes got inside a rock as hard as agate. It is the claim of geologists that the spots were caused by infinitely minute seams or fissures in the softer parts of the rock being filled with metallic oxides when the world was young. These oxides made four different colors that form various combinations of color when blended together, or appear in single colors in each rock.
The red color is oxide of iron. The black is oxide of manganese. The green is oxide of copper. The blue is oxide of nickel. This theory has been elaborated by the help of
high powered microscopes which show the tracings of little canals so close the naked eye could not detect it; but the oxides remained, staining the rocks in wonderful designs.
The fernlike and branch effects of the trees grass and shrubbery come from the fact that the tiny canals branched out in various subdivisions forming smaller canals for a
common center. In addition to these canals, the rock became flawed through shrink-age while passing through a period of evaporation which, according to scientists, has taken more than three million years to reduce the stone to the hardness of 7 on the Mohs scale. These canals and flaws have been perfectly healed by soft silicate formations of which the stone is a part, and the evaporation has caused the oxides to take on such forms as seen on the window after a frosty night.
Technically, Montana agate is known as "dendritic" agate, and the moss spots are called "dendrites". It is the third hardest stone in the world, and is cut only with a diamond saw. There can never be two pieces alike even though cut from the same stone.
Source: *STAR-O-LITE6/11 via* The Petrified Digest via Strata Gem 11/10; via Stoney Statements 6/11

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Lapidary Hints

Cabs Always Fall off the Dop.

Well a couple of possible reasons, first, if you are using old dop wax, or wax that has been heated many times, you may have to recharge it to get its tackiness back. Do this by melting some real beeswax in with the dop wax.
Second, if you left the dopped cabs in the shop overnight, and the temperature dropped, that is just like putting them in the freezer to detach them. You will have to redo the cab, or bring the dopped cabs inside so they stay warm.

Healed or Not?

If you are not sure as to whether a fracture in a slab is a healed fracture of not, wet your finger and swipe it across the fracture. Watch the fracture as the water dries, the fracture if NOT healed will take a bit longer to dry out.

Tiny Work.

When polishing small crevices, use a shish kabob stick. the larger ones will fit a Dremel or Dremel like hand
piece.
Simply dip the tip in water, then in the polish, and let it go. Fire Agate is a fine example for this tip.
Star-O-Lite via BGMSNewsLetter1209; via Stoney Statements 6/11

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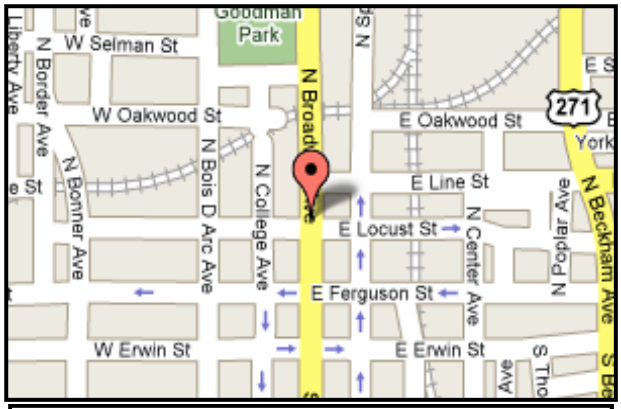

THE EAST TEXAS GEM AND MINERAL SOCIETY MEETS ON THE FIRST MONDAY OF EACH MONTH, UNLESS THAT DAY IS A HOLIDAY, THEN THE MEETING IS MOVED TO THE SECOND MONDAY. WE MEET AT THE DISCOVERY SCIENCE PLACE, 308 NORTH BROADWAY, JUST NORTH OF DOWNTOWN TYLER, TEXAS. MEETINGS BEGIN AT 6:45 P.M.

NOTE TO EDITORS

Feel free to use contents and graphics for non-profit newsletters. Give credit when and where due.

Purpose of the East Texas Gem & Mineral Society

Is to promote the study of geology, mineralogy, fossils and the lapidary arts.
The public is always invited to attend all club meetings.

Annual dues are $10.00 for adults and $2.50 for juniors.

Please send any info or articles to be included in the newsletter to the Editor by the 15th of the month. Please keep your address, phone and email information up-to-date, so that we can get the newsletter to you in a timely manner. Out-of-date information costs the club time and money in returned newsletters.

Thank you... SB

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