PBS-SEPM NEWSLETTER

May – June 2012

PBS-SEPM 2011-2012

April 17th, PBS-SEPM Luncheon Mtg, 11:30 am Midland Center
Speakers Dr. Emily Stoudt, Dr. Bob Loucks, and Toyly Abdullauev
Topic Ellenburger Core Workshop

May 15th, PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center
Speaker Sal J. Mazzullo PhD.
Topic Mississippian Stratal Architecture, Depositional and Tectonic History, and Petroleum Geology in the Southern Midcontinent

June 19th, PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center
Speaker Dr. Seay Nance Bureau of Economic Geology of The University of Texas at Austin
Topic Cycle Sets and Chemostratigraphy of the Leonardian Mudrock Successions in Deleware and Midland Basins, Texas

June 7-10th, Young Professional and Intern Field Trip (See Flier in Newsletter)

Ellenberger Core Workshop

Tues., April 17th, 2012
11:30 am. Midland Center, Midland, Texas
RSVP by April 16th, 432-683-1573 or email: wtgs@wtgs.org

Paragenesis of Lower Ordovician Ellenburger Group Paleokarst Breccias and Fractures in Central and West Texas

Robert. G. Loucks
Bureau of Economic Geology,
Jackson School of Geosciences
The University of Texas at Austin

Several origins have been suggested for the development of large-scale brecciation and fracturing in Ellenburger strata, including karst-related paleocave development and collapse, subsurface thermobaric dissolution and fracturing, and tectonic fracturing and brecciation. Most brecciation and fracturing .
in the Ellenburger Group actually result from near-surface, meteoric karst that developed mainly during the Sauk Unconformity (~475 Ma before present) and that was modified by later karst processes during Pennsylvanian exposure (~280–300 Ma before present). Because some areas show a strong overprint of hydrothermal alteration and tectonic fracturing, all three suggested processes probably affected Ellenburger strata, but at different times.

Early, widespread brecciation and fracturing in the Ellenburger Group have been well documented to result from subaerial exposure and associated meteoric cave formation and collapse. The collapse, starting at the surface contemporaneous with cavern formation, continues into the subsurface to at least 9,000 ft of burial. Cave formation is evidenced by (1) multiple types of detrital cave-sediment fill in cavities and fractures, (2) Upper Ordovician to Mississippian conodonts in the sediment fill, (3) speleothems, and (4) lateral dimensions and patterns of brecciated bodies. Paleocave collapse is therefore the probable origin of most brecciation and fracturing in Ellenburger strata. Hydrothermal-related, coarse- to very coarse crystalline saddle dolomite cements are evidence of a higher temperature overprint that occurred during the Ouachita Orogeny.

June 19th, **PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center**
Speaker Dr. Seay Nance
Topic: "Cycle Sets and Chemostratigraphy of Leonardian Mudrock Successions in Delaware and Midland Basins, Texas"

July and August Summer Break

September 18th, **PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center**
Speaker Dr. Micheal Pope
Topic: " Carbonate Slope Deposits"

October 24th, **PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center**
Speaker : Ron Broadhead
Topic: Helium in New Mexico, Geologic Distribution and Exploration

November 6th, **PBS-SEPM Luncheon Mtg, 11:30 am. Midland Center**
Speaker : J. Frederick Sarg and Kati Tänavsuu-Milkeviciene
Topic: "Predictive Sequence Stratigraphic Framework for Organic—Rich Lake Basins, Colorado and Utah—Oil Shale and Unconventional Oil Play

Saddle dolomite cements passively fill many voids created by cave processes, but they also appear to fill some vugs associated with hydrothermal dissolution. Tectonic fractures cutting host rock, lithified breccias, and lithified sediment fills have relatively strong directional patterns in the Ellenburger where they were studied.

Because deciphering the origin of complex breccia and fracture systems, such as seen in Ellenburger strata, is commonly difficult, the complete paragenesis of a system must first be understood. Paleokarst is common at ancient, composite unconformities, as shown in the geologic record. The paleokarst pore network may therefore form the dominant conduit in these systems, and later fluids, such as subsurface-derived hydrothermal fluids, may migrate through these conduits and modify the strata either passively or aggressively. Passive modification occurs when hydrothermal cements precipitate in former voids and have no relationship to the origin of the voids. Aggressive modification occurs when fluids create voids and breccias and precipitate hydrothermal cements into these voids. Tectonic fractures can overprint any system at different times, and these events must be worked out by first becoming familiar with the tectonic and burial histories of individual regions.

Robert Loucks is a senior research scientist at the Bureau of Economic Geology. He received his B.A. degree from the State University of New York at Binghamton in 1967 and his Ph.D. from the University of Texas at Austin in 1976.

His general research interests include carbonate and siliciclastic sequence stratigraphy, depositional systems, diagenesis, and reservoir characterization. His present research includes deep buried reservoirs in the Gulf of Mexico, evaporite and carbonate paleokarst, and pore networks in carbonates, sandstones, and mudrocks

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Central Texas Ellenburger Core Workshop – Identification of Depositional Environments, Correlation of Shallow Water Depositional Cycle Packages and Recognition of Potential Reservoir Intervals from 2 Cored Wells

Toyly Abdullayev and Emily L. Stoudt, University of Texas Permian Basin

The term “Ellenburger Limestone” was first introduced by Paige (1911) to describe the lower Ordovician carbonate rock outcrops in the Ellenburger Hills of the Llano region in central Texas. The Ellenburger was elevated to group status and subdivided into three formations (Tanyard, Gorman, and Honeycut) by Cloud and others in 1943 (1945). In 1948, Cloud and Barnes published an extensive compilation of central Texas Ellenburger outcrop data. The Ellenburger of central Texas is equivalent to the productive Ellenburger dolomites of the Permian Basin and nonproductive El Paso group in far west Texas. The central Texas Ellenburger rocks are not completely dolomitized and hence can provide more information about the original depositional environments and cyclicity than the subsurface dolomitized Ellenburger in the Permian Basin.

Mineral exploration cores were cut in a number of shallow wells on the north and west sides of the Llano uplift in the 1950's and 1960's. Some of these wells cut continuous core through the entire Ellenburger Group. They have been stored at the Bureau of Economic Geology in Austin. Until recently they were unslabbed and unstudied. Mr. Toyly Abdullayev has examined two of these cores for his Master's Thesis at The Univerisity of Texas of the Permian Basin. They are the Johanson MC-1 (McCullogh County) and the F.M. Glaze C-2-3 (San Saba County). The two cores display a combined total of @ 1,600' of continuous section, starting at the top of the Ellenburger Group and ending either near or below its base. Both cores have been slabbed, photographed and examined macro and microscopically. Before they are returned to their permanent "home" at the BEG in Austin, we will display the entire cored interval of both wells for the west Texas geologic community.

Despite a strong diagenetic overprint in portions of both of the cored wells, we have identified open marine, various types of shoals and tidal flat depositional environments. We have packaged these environments into several types of depositional cycles. One type shallows up to tidal flats and exposure, is generally less dolomitized, contains algal laminations, fenestral textures and mudcracks, and is relatively less porous and permeable. A second type shallows up to high energy grainstone shoals, is highly dolomitized in the shoal caps, contains cross bedding, and is relatively more porous and permeable. A third type consists of rip-up clast capped cycles that are generally limestone but can be dolomitized, and are less porous and permeable. The fourth type contains open marine cycles with normal marine faunas. These cycles are less dolomitized, but are also less porous and permeable.

The Johanson and Glaze cores can be correlated from west to northeast. The Cambrian San Saba/Ordovician Ellenburger contact is used as a datum upon which to hang the cores. Cloud and Barnes (1948) indicated that Ellenburger outcrops thin westward due to erosion of the uppermost Honeycut formation and thinning of the Gorman formation. We have observed the same westward thinning in central Texas Ellenburger cores. However, the basal Ellenburger in the Johanson core contains the most open marine deposits observed to date, suggesting that the ocean deepened westward from the Llano uplift in Early Ordovician time. Numerous trilobites, brachiopods, and crinoids occur in this core. As you move to the north and northeast, Ellenburger cores display restricted depositional cycles with abundant oolite shoals and algal laminated tidal flats.

Cloud, P.E. Jr., and Barnes, V.E., and Bridge, J., 1943 (1945), Stratigraphy of the Ellenburger Group in central Texas- a report: The University of Texas, Bureau of Economic Geology Publication, No. 4301, 390p.

Cloud, P.E. Jr., and Barnes, V.E., 1948, The Ellenburger Group of Central Texas: The University of Texas, Bureau of Economic Geology, Publication, No. 4621, 400 p.

Paige, S., 1911, Mineral resources of the Llano-Burnet region, Texas: United States Geological Survey Bulletin 450, 103 p.

Dr. Emily L. Stoudt

Brief Career Biography

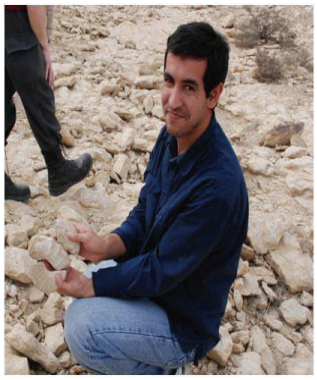
Dr. Emily L. Stoudt has spent her professional career studying the petrography, sequence stratigraphy and diagenesis of carbonate rocks. For 27 years, she applied this information to solving problems related to exploration and production of hydrocarbons. Currently she is a tenure-track assistant professor at Univ. of Texas of the Permian Basin.

She teaches physical geology, invertebrate paleontology, and graduate classes in carbonates and sandstones. Her research interests include all units in the Permian Basin, as well as the Cambrian and Ellenburger of central Texas and the Cretaceous of Texas.

Emily has taught many courses for workshops and seminars. Topics include carbonate deposition and diagenesis, sequence stratigraphy, and reservoir characterization. She is an active member of AAPG, SEPM, WTGS and PBS-SEPM.

Toyly Abdullayev

Brief Biography



Toyly Abdullayev has been working on his master's degree under the supervision of Dr. Emily Stoudt since 2008. He has been mostly working with carbonate rocks (core work) from central Texas his thesis. From the fall of 2008 to 2011, he served as a teaching assistant. In the summers of 2009-2010, he did summer internships with Whiting Petroleum Corporation.

Since the fall of 2011, he has been doing core description of San Andres Formation from Goldsmith Field under the supervision of Dr. Trentham and Dr. Stoudt.

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Since 2008 – Working on M.S. Geology UTPB

Lava flow into Eocene aged lake South Hwy 118, Brewster County, Texas

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Mark Russell

President's Column

David Thomas III

At the annual meeting to be held May 15, 2012, I will be turning over the president's gavel to President Elect, Robert Nail, who will lead the organization for the 2012-2013 term. I would like to express my appreciation to the Executive Board members who served beside me and commend them for all they have done while I have been president. With the increase in the oil prices and resultant rig count, we all had additional time demands on us at work yet were still able to present a full slate of opportunities to our local geological community.

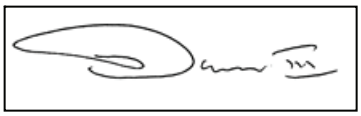
We put on three field trips during the year, one more than usual, as the Spring Field trip to the Sacramento Mountains was delayed due to dry weather and fire danger. Robert Nail, President Elect, did an outstanding job of coordinating the trip considering all the work had to be done twice. I would like to thank Robert Nail and our field trip leader, Xavier Janson, for seeing the trip through despite the uncertainties.

Robert Campbell, 1st Vice President, coordinated the other two field trips, both of which received outstanding reviews. The recent trip to Terrell County and the Big Bend area to contemplate folds, faults and fractures was well received and I have heard nothing but positive feedback about the trip. I would like to thank Richard Erdlac and Gilbert Barrigan, field trip leaders, along with Robert Campbell for all the hard work they did on the logistics and publications.

The Young Professional and Intern Field Trip is becoming an annual event and Robert Campbell along with Emily Stoudt, Robert Trentham and Chris Fling are to be applauded for the work they have done for the trip conducted June 9-12, 2011, and the work they are doing in preparation of the trip June 7-10, 2012. This is a first class opportunity for landmen, geophysicists, geologists, and engineers to visit world class outcrops and be able to work on problems in a multidiscipline environment with seasoned professionals. Take the time to see that the field trip information is distributed to the right people in you organizations.

In addition to the three field trips the society will have conducted two core workshops, the one on August 2, 2011, on the "Geology of the Capitan Shelf Margin" put on by Mitch Harris and coordinated by immediate past President Teri McGuigan. The second is to be held Tuesday, April 17, 2012, with two talks, one by Robert Loucks and the other by Toyly Abdullayez and Emily Stoudt and is being coordinated by Curtis Helms, Treasurer. I would like to give a very special thanks to Wayne Helms and Weatherford for transporting and helping to set the cores up for both workshops.

As Chairman of the Luncheon Program Committee, Curtis Helms provided a high quality slate of speakers to date and has them booked through November. A great year requires the contributions of a host of people but there is always one that provides the stability and guidance an organization needs. In the case of the PBS-SEPM that person is Paula Mitchell. Paula, we all thank you for what you do!



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Do you have an idea for an interesting luncheon talk? Have a core workshop you'd like to present? Have some suggestions on how PBS-SEPM can better serve the geologic community?
Just click on the e-mail above and drop us a note—
your PBS-SEPM Executive Board would LOVE to hear from you!

Science is a way of thinking much more than it is a body of knowledge.
Carl Sagan

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Upcoming Events and Scheduled Luncheon Meeting Lecturers

SEPTEMBER 18, 2012	**Dr. Michael Pope** Texas A&M University	**TBA** *Carbonate Slope Deposits*
OCTOBER 16, 2012	**Ron Broadhead** New Mexico Bureau of Geology and Mineral Resources a Division of New Mexico Tech	***Helium in New Mexico:*** ***Geologic Distribution and Exploration Possibilities*** *http://www.pbs-sepm.org/Abstracts/Broadhead_Helium_Abstract.pdf*
NOVEMBER 6, 2012	**J. Frederick Sarg** **and** **Kati Tänavsuu-Milkeviciene** Colorado School of Mines	**Predictive Sequence Stratigraphic Framework for Organic-Rich Lake Basins: Green River Formation, Piceance and Uinta Basins, Colorado and Utah—Oil Shale and Unconventional Oil Play** **http://www.pbs-sepm.org/Abstracts/Nov6_Sarg.pdf** **http://wtgs.org/events/register/16/?submit=Register**
DECEMBER 2012	***CHRISTMAS BREAK***	***CHRISTMAS BREAK***

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The fewer the facts, the stronger the opinion.

Arnold H. Glasow

PBS-SEPM is the Permian Basin Section of SEPM – the Society for Sedimentary Geology. However, you do not need to be a SEPM member or a geologist to join PBS-SEPM.

Our non-profit society relies upon the efforts of dedicated volunteers to serve the geological community – primarily through educational events. These events include monthly luncheon talks, core workshops, annual field trips, and special geological publications. Thanks to our Education Committee we are involved in MISD 5th grade geology presentations to interest elementary students in pursuing a career in geosciences. We would like to increase our exposure on college campuses – reaching out to future earth scientists through scholarships, discounted memberships, and offering full-time geology students the ability to participate in professional-grade field trips at little to no cost.

If you would like to join PBS-SEPM, you may visit our website (www.pbs-sepm.org) to learn more about us, discover how to get involved and download a membership form.

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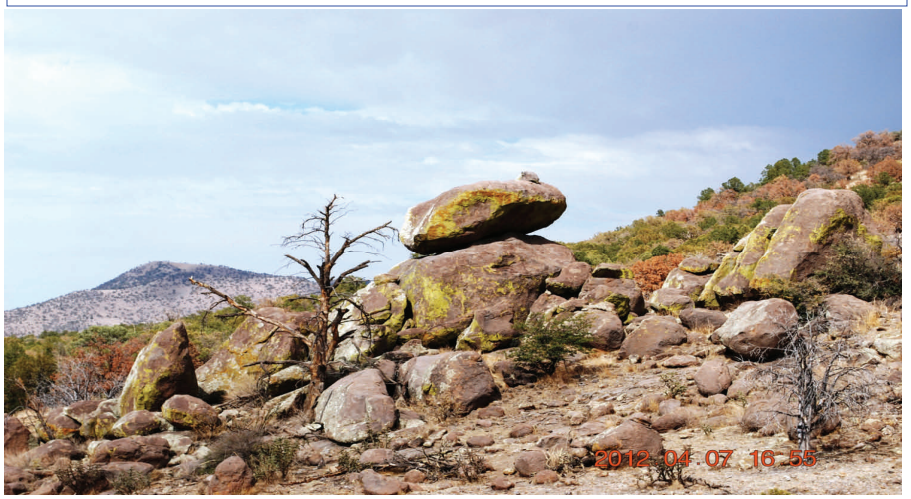

Weathered Syenite Boulders, Sawtooth Intrusion,
West of Fort Davis, Texas