



# NEWSLETTER

## 2012 Annual Meeting and Field Review a Big Success



Dr. Patrick Mulvany directs AMG 2012 Meeting attendees to a biohermal mound in a Jefferson City Dolomite roadcut north of Rolla.



## **A Note from the President**

Half a year has quickly gone by since the 2012 annual meeting. I hope everyone enjoyed the meeting, field trips and other activities as much as I did. I consider the event a success and a step forward in developing some exciting new efforts for the association. Last year we had the opportunity to partner with the American Institute of Professional Geologists-Missouri Section (AIPG) by providing a college level poster contest. Again this year, we will co-sponsor a poster contest at the annual meeting to be held in Joplin. This college-level contest is hopefully becoming a great annual event.

During preparation of last year's meeting an idea developed, or maybe redeveloped, to give AMG something additional for their membership. This mid-year newsletter has been compiled as an effort to keep us all in touch with AMG a little more often. Please feel free to comment through the website at <http://www.missourigeologists.org/> about the types of information you would like to see in future newsletters.

Finally, your incoming president Damon Bassett, geology instructor with Missouri State University, is preparing an exciting meeting to be held this September in Joplin. Field trip topics will likely include mining remediation, environmental impact of the Joplin tornado, and late Devonian to early Mississippian tectonic activity as evidenced in recent Highway 71 roadcuts. It is sure to be an excellent meeting.

Everyone have a great spring and summer, and I'll see you in Joplin at the fall meeting.

Jerry

## **2012 Award Winners**

The O.R. Grawe Award for Outstanding Undergraduate Geology Student was awarded to Ms. Krista Rybacki from the Missouri University of Science and Technology in Rolla, MO. The Clayton H. Johnston Award for the best graduate student paper presented at the Missouri Academy of Sciences was awarded to Jim Berglund of Missouri State University in Springfield, MO.

Several students attended the annual meeting and presented their research in the AIPG poster contest. The winners were: Mark Larson—3<sup>rd</sup> Place, Stephanie Stratton—2<sup>nd</sup> Place, and Steve Shields—1<sup>st</sup> Place. All three students attend Missouri State University.

## **AIPG Poster Contest**

AIPG will be paying the AMG banquet fees for participating students and also award tuition assistance cash prizes to the top three presenters in the amount of \$600, \$400, and \$200 for first, second and third place respectively. Undergraduate and graduate geoscience students from all Missouri universities and colleges are welcome to participate.



## Legislative Update

AMG members should be aware of a proposed measure to eliminate licensure requirements for the practice of geology. This is Missouri House Bill 659. The bill was introduced by Representative Nick Marshall from the 13<sup>th</sup> District near Kansas City, MO. According to a summary on the Missouri House website, the bill would eliminate licensure requirements for several professions. These professions include geologists, boxing or wrestling contestants, massage therapists, interior designers, private investigators or private fire investigators, landscape architects, barbers, cosmetologists and cosmetology school operators, embalmers, and athlete agents. Further information is available online at <http://www.house.mo.gov>. The bill is not currently on a House calendar or scheduled for a hearing.

## Geology at a Glance (from the blog of the Missouri Geological Society)

### SEE CLEARLY WHAT MISSOURI SANDSTONE CAN DO

Look through the window of your house or car, or even your water glass, and you are looking at sand. More precisely, you are looking through products made from pure silica sand (silicon dioxide or SiO<sub>2</sub>) and there is a chance it originated as part of Missouri geology. Sand has been mined for glass manufacture in Missouri since the Pittsburg Plate Glass Company began in the 1870s. This sand is mined from the St. Peter Sandstone, a highly pure quartz sandstone. Recently, producers have been placing more than half a million tons of the Missouri industrial mineral into the market each year. Some of this sand is still used for glass manufacture, but more is now being used by the oil and gas industry as a proppant.

### OUR MISSOURI STATE CAPITOL WAS BUILT WITH MISSOURI LIMESTONE

The present Missouri State Capitol was built over a period of time from 1913 to 1917. Its exterior and interior were constructed from limestone that was quarried, shaped, and dressed in southwestern Missouri in Carthage and at Phenix. During construction, the limestone in the interior with its glossy, reflective polish was frequently called 'marble', a connotation that exists to this day. True marble is metamorphic and typically contains no fossils because of the recrystallization of calcite during metamorphism. The 'marble' in the Missouri State Capitol is a cut-and-polished fossiliferous limestone. True marble is not known to occur in Missouri.

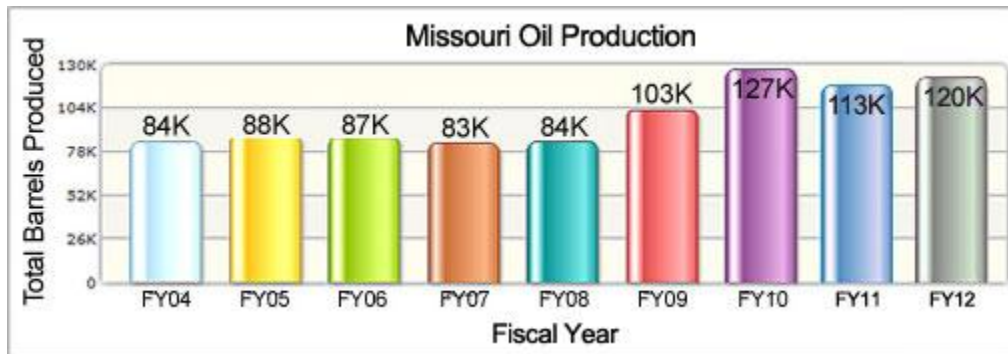
### PROPERTIES OF THE CAPITOL LIMESTONE

Specific gravity:	2.64—2.71
Weight per Cubic Foot:	165—167 pounds
Porosity:	1.3%
Absorption:	0.45—0.50% by weight
Hardness:	3 on Mohs scale
Compressive Strength:	10,425—17,777 psi (on bed) 10,052—15,396 psi (on edge)
Solubility:	Very slight in water, high in acids



## MISSOURI'S OIL RESOURCES ARE MORE IMPORTANT THAN MOST REALIZE

Most people are not aware Missouri produced over 170,000 barrels of crude oil last year alone. We may also be consuming it in a different way than most people would expect. When we hear the words “crude oil” we tend to think of black viscous liquid pumped from the ground used to manufacture fuels such as gasoline and diesel. It's not commonly known that through the refining process 7 gallons out of a 42 gallon barrel (16%) is used to manufacture thousands of other products that we use frequently and rely on.



*Missouri Oil Production, MDNR*

These products are agricultural, such as fertilizers and food preservatives; medicinal such as aspirins, antiseptics, anesthetics, syringes, bandages, artificial limbs, and heart valves; beauty and hygiene such as clothing, lipstick, body lotion, contact lenses, shaving cream, and obviously petroleum jelly. The list goes on and on. As a matter of fact, it might be more difficult to find something that does *not* rely on crude oil to manufacture than items that do. Another Missouri resource used in the development of many products is the soybean. This is an example of the old adage, “If it can't be mined, it has to be grown.”

## MISSOURI IS THE WORLD'S LEADING PRODUCER OF “FULLER'S EARTH.”

Since the early 20<sup>th</sup> century fuller's earth has been mined in significant quantities from southeast Missouri. Currently more than 400,000 tons of this clay material is being mined in Missouri each year with an annual value of 30 million dollars. This clay mineral is primarily hydrous aluminum silicate which possesses an excellent ability to absorb oil based substances. Centuries ago, wool cloth makers known as “fullers” used this mineral to remove lanolin and other oils from woolen materials. More recently it is used in the treatment of pulmonary fibrosis and to absorb contamination from military personnel involved in chemical and biological warfare. This mineral's ability to absorb oils is why it is also used in the cosmetic industry as facial clay treatments to cure acne. However, you might be familiar with one of today's most common uses of fuller's earth...cat litter.



## EPA Releases Progress Report on Study of Potential Impacts of Fracking

In December of 2012, the US Environmental Protection Agency released a progress report on their *Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources*. The EPA began research on this study in 2011. The study is designed around five primary research questions:

- *Water Acquisition:* What are the possible impacts of large volume water withdrawals from ground and surface waters on drinking water resources?
- *Chemical Mixing:* What are the possible impacts of hydraulic fracturing fluid surface spills on or near well pads on drinking water resources?
- *Well Injection:* What are the possible impacts of the injection and fracturing process on drinking water resources?
- *Flowback and Produced Water:* What are the possible impacts of flowback and produced water surface spills on or near well pads on drinking water resources?
- *Wastewater Treatment and Waste Disposal:* What are the possible impacts of inadequate treatment of hydraulic fracturing wastewater on drinking water resources?

The EPA will address these questions through five lines of inquiry: analysis of existing data, scenario evaluations, laboratory studies, toxicity assessments, and case studies.

The possible impacts of water acquisition for hydraulic fracturing will be assessed through the analysis of existing data on hydraulic fracturing operations and through detailed scenario evaluations and computer modeling. Multiple hydrologic settings are being modeled, with both semi-arid and humid river basins.

The effects of chemical spills on or near well pads are being studied from existing data in spill databases, through the review of relevant scientific data, and toxicity assessments. The December progress report emphasizes that the EPA has not yet come to any conclusions about the extent of exposure to various chemicals from the hydraulic fracturing process or the possible impacts on drinking water resources. Similar methods are being used to evaluate the potential effects of spilling flowback or produced water.

Complex computer models are being used by the EPA to examine gas and fluid migration from deep shale plays to overlying aquifers. There are reported six different scenarios being studied, including migration due to poor well construction, migration via fractures both natural and artificial, and migration through nearby existing wells.

Laboratory studies are mainly concentrated on the possible impacts of inadequately treated wastewater being discharged to rivers. Many existing analytical methods are being refined or modified to detect chemicals of interest at low levels.

The draft results from the study are not expected until late 2014.

