



Arizona Geological Society Newsletter

MARCH 2013

March 5, 2013 DINNER MEETING

Who: Isabel Fay will be our featured speaker. See abstract below.

Where: Sheraton Tucson Hotel and Suites, 5151 East Grant Road, at the intersection of Grant and Rosemont on the North side of Grant in the *Pima Room*. The Pima room is located on the second floor in the northwest corner of the hotel.

When: Cash Bar at 6 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.

Cost: Members \$27, Guests \$30, Students are free with reservation (\$10 without).

RESERVATIONS are REQUIRED: CALL 520-663-5295 by 11 a.m. Thursday, March 1 or reserve on the AGS website (www.arizonageologicalsoc.org). Please indicate regular (Baja Enchiladas made with chicken machaca, anaheim tomatillo sauce, rice, and avocado lime crema), vegetarian, or cobb salad meal preference. Please cancel by Thursday March 1 at 11 a.m. if you are unable to attend—no shows and late cancellations will be invoiced.

The March dinner meeting is sponsored by:

VOLKER SPIETH

President of VS.GLOBALMETAL LLC

AGS is grateful for Volker Spieth's sponsorship, which helps to offset dinner meeting costs. You can learn more about Volker Spieth at

<http://www.linkedin.com/in/volkerspieth>

or contact him at vs.exploration@gmail.com.



ABSTRACT

Georgius Agricola, *De Re Metallica*, and the Development of Earth Science

Isabel Fay

Georgius Agricola's works, especially *De Re Metallica* (1556), founded the study of ore deposits geology and helped develop the modern quantitative and empirical approach to earth science from the previous medley of alchemy, astrology, and mysticism. Notwithstanding its influence during the 16th-17th centuries and role in founding earth science, its importance is typically underestimated, and few scientists today are familiar with *De Re Metallica* or its significance.

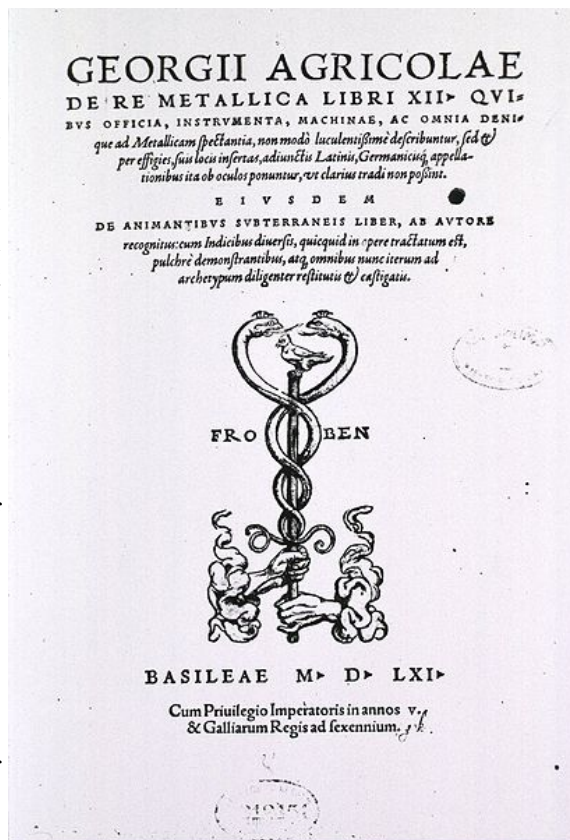
Modern science is founded on the concepts of empiricism and critical evaluation developed in Europe between medieval times and the Enlightenment. During this time, ancient texts on alchemy, astrology, and other mystical approaches to inquiry were reevaluated and their contents critiqued and correlated with observed facts. This led to the abandonment of prior authority-based, mostly deductive investigation, in favor of a more inductive, fact-based process that eventually developed into the modern scientific method.

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This shift began from the synthesis of knowledge derived from ancient theory with a new appreciation for practical understanding. Nowhere was their confluence more pronounced than in mining, where the geological facts that determined mining practice also produced a theoretical interest in their causes. Such theoretical interests took the form of alchemical and mystical speculation up to the 16th century, when, under the influence of the Protestant Reformation and the resurgence of Aristotelian thought, they developed into science.

Georgius Agricola's *De Re Metallica* was both a result of this shift in thought and a stimulus to further change. It represents one of the first expositions of the modern approach to science. In it, Agricola systematized and clarified the existing body of knowledge on geology, analyzing classical and medieval sources with respect to the facts he had observed over a lifetime of research in the mines of Saxony. By paying careful attention to facts and by using them to judge the canonical authorities, Agricola not only founded modern economic geology and mineralogy, but helped to develop chemistry, mineralogy, and geology out of alchemy and science out of speculation.

**About The March Dinner Meeting Speaker****Isabel Fay**

After doing her undergraduate work at the University of Oklahoma, Isabel Fay moved to Arizona, where she earned her M.S. in 2010 from the University of Arizona. Her work focused on Freeport-McMoRan's operation in the Tenke-Fungurume Copper-Cobalt district, on the Democratic Republic of Congo side of the Central African Copperbelt. After earning her M.S. degree, Isabel stayed at UA as one of Dr. Mark Barton's Ph.D. students. She has expanded the scope and enhanced the detail of her studies in the same district. Her work centers on the formation of large, sediment-hosted Cu-Co deposits and on how the alteration processes reworked them several times over the last >800 million years. Isabel is a member of AGS and SEG and is the newest member of the AGS Executive Committee. In her free time she enjoys reading to expand her knowledge of geology, history, and philosophy.

Thanks to the Investment Committee

The Arizona Geological Society's Investment Committee acts as a financial advisor to the Executive Committee and manages the Society's financial affairs. We would like to acknowledge the members of the committee, Ted Eyde, Ann Pattison, Steve Van Nort, and Charles Miller who recently ended his tenure on the committee. Charles had been part of the Committee since 2009 and served as Chairman in 2010. The AGS relies on volunteers to accomplish the Society's goals. One of the most valuable ways an AGS member can contribute to the Society is by volunteering time to committee such as the Executive Committee, Scholarship Committee, and Publications Committee.

AGS to Draft Position Statements

By Alison Jones—2013 AGS President

Occasionally a local news item appears that gives me pause, and makes me worry for the future of our educational system and the future of the State of Arizona. One such story appeared in the Arizona Daily Star on February 5, 2013. You can read it here: http://azstarnet.com/news/science/environment/az-bill-would-let-teachers-dismiss-global-warming/article_4bec9422-44b6-5b49-b0da-78513c959433.html.

The title of the story, “AZ bill would let teachers dismiss global warming” is not really the point. The bill, SB 1213 proposed by Senator Judy Burges of Skull Valley, seems innocuous enough when you read it (<http://legiscan.com/AZ/text/SB1213>). But it is carefully crafted to open the door to allow non-scientific dogmas regarding such topics as evolution, the age of the earth, the chemical origins of life, and climate change to be taught as *scientific* theories. As scientists, we have no objection to questioning, examining the evidence, and considering the viability of other theories. But in the end, the scientific process leads us where it leads us. We need to keep it that way.

The Arizona Geological Society has a horse in this race. Our bylaws state, “The object of the society shall be the promotion and encouragement of interest in the science of geology and in the geology of the State of Arizona.” We have a responsibility to speak out for science and the students in our educational system. We have a responsibility to provide our legislators with the scientific information they need (and appear to be lacking) when making policy. And we have a responsibility to all of society to convey our message of science over dogma.

Fortunately, we don’t have to do this alone. The Geological Society of America issues “Position Statements” in support of and consistent with the GSA’s Vision and Mission, to “develop consensus on significant professional, technical, and societal issues of relevance to the geosciences community.” Position Statements are the basis for statements made on behalf of the GSA before government bodies and agencies and communicated to the media and the general public. You can see all of GSA’s Position Statements here: <http://www.geosociety.org/positions/>.

GSA’s Position Statements are available for our use as we further our mission of advancing the science of geology. As AGS President for 2013, I have proposed to our Executive Committee that we develop position statements regarding geological topics that are relevant to the State of Arizona. In many cases we may wish to adopt the GSA position without changes. In other cases, particularly those where GSA has not yet issued a position, we will need to craft our own.

Arizona is not alone, of course. Other states are struggling with the same issue. But it is still shocking to watch the YouTube video where one of our legislators states with conviction (not once, but twice!) that our planet is 6,000 years old. (<http://www.youtube.com/watch?v=G9iOgjQ96o>). Such people do nothing to help their causes or the State of Arizona. When you say that the Earth is 6,000 years old, everything you say after that is suspect.

I encourage input from the AGS membership as we proceed with this endeavor. We can make our positions known without jeopardizing our 501-c-3 tax-exempt status. Indeed, it is our responsibility to do so.

AIPG Arizona Section “Golden Anniversary” Trip to Chihuahua, Mexico

To celebrate AIPG’s 50th anniversary, the Arizona Section has prepared a geologic vacation to the State of Chihuahua, Mexico from **April 5 to April 11, 2013**. This trip will have excursions to world-famous localities that can be appreciated by both the professional geologist and the general public. The trip is open to others outside of the Arizona section.

The localities are listed in the itinerary below. Each deserves its own detailed description, so this is just a taste of the trip. A visit to the **Naica Mine** and the enormous selenite crystals is a once-in-a-lifetime experience in itself. The Discovery Channel programs and National Geographic articles on Naica are great, but experiencing the cave yourself is unworldly. The geologic setting that the trip will explore in Chihuahua includes a Cretaceous limestone sequence with the lower formation at Naica and the upper formation near our northern destination of **Nuevo Casas Grandes** with stops at **Santa Eulalia** and **Terrazas**.

Learning about local history will be a fascinating part of the trip. The trip will cover history from millions of years ago (for the growth of the crystals at Naica), to the pre-Columbian time when **Paquimé** was occupied, to the Mexican Revolution in 1910.



Cueva de los Cristales (Naica Mine)

Day	Description of Activities
Day 1 (Friday, April 5)	Participants travel to Chihuahua City and check into the hotel.
Day 2 (Saturday, April 6)	Day trip to Naica Mine and tour of the Cave of Giant Crystals; Evening dinner in conjunction with local geologists (AIMMGM).
Day 3 (Sunday, April 7)	Visit to nearby historic mining district Santa Eulalia. Excursion to historic district of Chihuahua City and local museums.
Day 4 (Monday, April 8)	Check out of hotel in Chihuahua City and travel to Nuevo Casas Grandes with stop at exploration project (Terrazas). Check into hotel at Nuevo Casas Grandes/ have lunch. Travel to Mata Ortiz to see pottery-making with visits to artists’ studios, including watching a firing of pottery.
Day 5 (Tuesday, April 9)	Drive to scenic outlook along flank of the Basin and Range to view regional geology. Tour of museum and archeological ruins at Paquimé. Visit the Mormon settlement of Colonia Juarez.
Day 6 (Wednesday, April 10)	Check out of hotel in Nuevo Casas Grandes and return to Chihuahua City. Group dinner at restaurant with regional specialty menu.
Day 7 (Thursday, April 11)	Return to USA or start optional excursion to Copper Canyon (the optional trip would be with a local tour company).

The field trip fee is **\$375**, which includes transportation for the field trip. The fee does not include hotel or transportation to/from Chihuahua City. **Dawn Garcia**, the 2013 AIPG Arizona Section President, will be the field trip leader. Contact her to receive detailed information regarding the travel (email dgarcia@srk.com or call 520-471-9387).

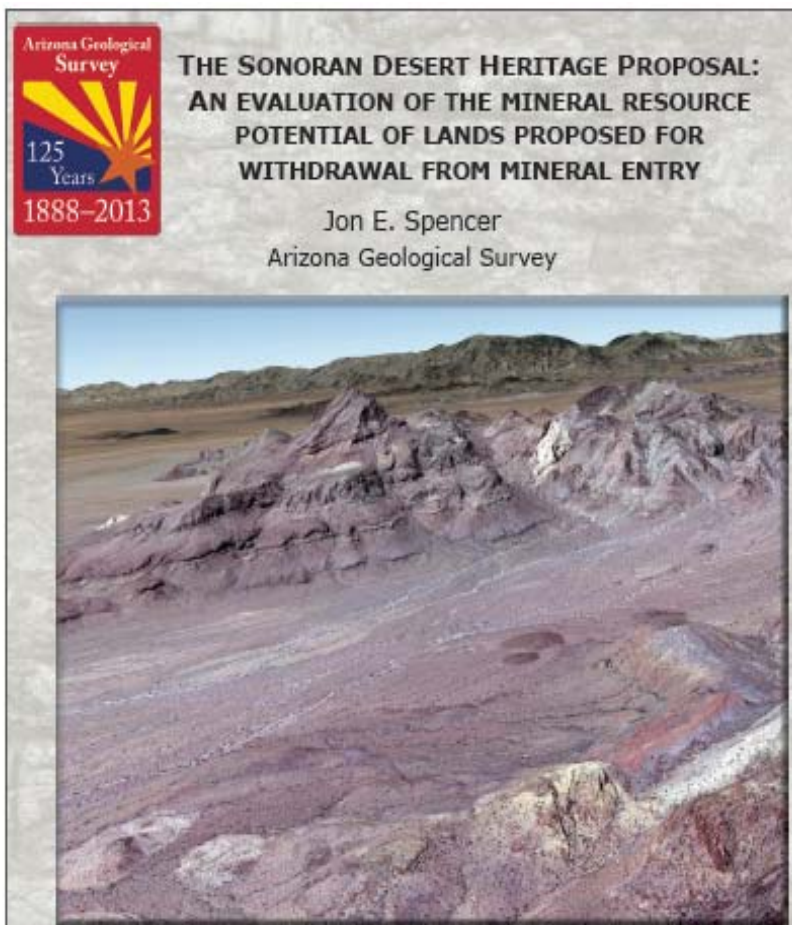
Remember to Renew Your AGS Membership

Thank you if you have already paid your 2013 AGS dues. To renew your membership you can go online at <http://www.arizonageologicalsoc.org/208/membership> or fill out and mail the form below.

Arizona Geological Survey News

As part of the Arizona Geological Survey's 125th Anniversary, the Survey hosts GeoSnaps – Geologic Image of the Day, a fresh geology- or mining-related image each day during 2013. To explore GeoSnaps, go to: <http://www.azgs.az.gov/125th-anniversary-azgs.shtml>.

Interested in gold or copper? Watch the February 20th *Arizona Mining Review* (<http://www.youtube.com/user/azgsweb>) with Lee Allison's interview of Nyal Niemuth on gold production and exploration in Arizona and for Jon Spencer's summary of gold, copper and manganese potential in the proposed Sonoran Desert Heritage Conservation Area of western Maricopa County. Jon's 24-page, open-file report, "The Sonoran Desert Heritage Proposal: An evaluation of the mineral resource potential of lands proposed for withdrawal from mineral entry," is being readied for publication.



Look for AZGS at the upcoming Tucson Festival of Books, University of Arizona Mall, on March 9th and 10th. AZGS will have two booths. For the newest in geology and natural history publications of Arizona, drop by the Arizona Experience Bookstore booth. Or visit the Arizona Experience video studio and "Tell us your Arizona experience." AZGS is inviting Arizonans of all stripes, from science, literature, industry, education, and the general public, to tell their stories to the AZGS video team for broadcasting on the Arizona Experience website (arizonaexperience.org). Each video interview will run 3 to 5 minutes and will be hosted online at the AZGS's "Tell us your Arizona experience" webpage. Interested? Call or e-mail Mike Conway (Michael.conway@azgs.az.gov or 520.209.4146) to schedule a time to tell your story.

For the latest news and updates on Arizona geology, geologic hazards, and mining and mineral exploration, check out Lee Allison's Arizona Geology blog (<http://arizonageology.blogspot.com>), the AZGS Facebook page (<https://www.facebook.com/AZ.Geological.Survey>), and the AZGS Twitter feed (<https://twitter.com/AZGeology>).

ANNOUNCEMENTS

Welcome New AGS Members

Kenneth Goodhue, KB International, Chattanooga, TN

Deanna La Velle, Fort Huachuca, AZ

Shelby Rader, Tucson, AZ

Glen Zinn, Tucson, AZ

Karen Masbruch, Tucson, AZ

Mark Nicholls, Waddell, AZ

Derrick Merkel, Tucson, AZ

Our thanks to these AGS members for their recent generous donations:

Volker Spieth,

Don Hammer, and

Kim Wilson donated to the Courtright Scholarship Fund,

Brin Lindley donated to the AGS' Greatest Needs Fund

Attention Student Members: AGS is pleased to provide free meals for student members with a dinner reservation. Please keep in mind that these meals are paid for by AGS. If you make a reservation and do not attend, AGS must still pay for the meal. If you are unable to attend, please cancel your reservation by 11 a.m. on the Thursday before the meeting. If the cost of no-shows continue to be a problem, the AGS Executive Committee may consider charging for unclaimed student meals, as we do for regular members.

2013 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, PO Box 40952, Tucson, AZ 85717

Dues (check box) 1 year: \$20; 2 years, \$35; 3 years: \$50; full-time student (membership is free)

NEW MEMBER or RENEWAL (circle one) Date of submittal _____

Name: _____ Position: _____

Company: _____

Mailing Address: _____

Street: _____ City: _____ State: _____ Zip Code: _____

Work Phone: _____ Home Phone: _____

Fax Number: _____ Cellular Phone: _____

E-mail: _____ Check this box if you do not have an email address

All newsletters will be sent by email. If you do not have an email address, we will mail a hard copy to you, but we cannot guarantee timeliness.

If registered geologist/engineer, indicate registration number and State: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright Scholarship Fund.

Enclosed is a _____ tax-deductible contribution to the AGS' Greatest Needs Fund.