



# AGS NEWSLETTER

ARIZONA GEOLOGICAL SOCIETY, INC., TUCSON, ARIZONA

JANUARY 2008

## JANUARY DINNER MEETING

Eric Force, U.S. Geological Survey

**Anasazi habitation at Chaco and McElmo canyons (NW NM and SW CO): the fluvial evolution context**

January 8 2008

**ABSTRACT**—Chaco and McElmo canyons both featured arroyos during Anasazi (AD 500-1300) habitation, but their histories of fluvial evolution differ sharply. Chaco's history was governed by a succession of dams, some eolian, one manmade, at the mouth of the wash. Chaco may have been originally chosen for settlement in its dammed state because of an impounded lake, but when the dams failed, entrenchment was rapid. Abandonment of much of the canyon was the initial Anasazi response, but resettlement in a much grander and labor-intensive style began around AD 1030 while an arroyo still existed. This is the period for which Chaco Canyon is most famous, due to its numerous great houses, regional system of straight roads, great kivas, water-control features, etc. The arroyo was filled in by about AD 1100, prior to canyon abandonment about AD 1200. Thus entrenchment did not cause abandonment as some earlier authors thought; indeed abandonment came during a period that may have been a little swampy.

In contrast, entrenchment in McElmo Canyon developed very slowly, and only one reach at a time. At any given time, a reach existed that was accumulating sediment across a broad channel, and such reaches were the basis for Anasazi

floodwater farming at McElmo. This style of fluvial development is called complex response, and this name reflects the habitation history also; as the locus of accumulation shifted upstream, Anasazi settlement did track that habitat.

Climate change was undoubtedly a factor in the fluvial evolution of both areas, but if that change was simultaneous, the two areas show how differently fluvial systems can respond. The difference is analyzed in terms of thresholds, system stability, and lag times.

The different human evolution of the two areas follows in a logical if somewhat unpredictable way from the fluvial evolution. Complex response at McElmo required periodic movement of Anasazi habitation to keep up with areas that could be farmed by simple floodwater methods, but there was no reason to attempt anything fancier. At Chaco, the shock of sudden entrenchment caused temporary abandonment until the means of overcoming this problem were devised. This required labor-intensive water-control and road-building, and the needed labor force required accommodation.

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### Dinner Meeting Information — Inn Suites, 475 North Granada, Tucson

To reserve your place for dinner, call 520-663-5295 before 5 pm, Friday, January 4, 2007.

**AGS CAN NO LONGER GUARANTEE DINNER SEATING FOR THOSE WHO SHOW UP WITHOUT A RESERVATION.**

Cost: Members \$24, Guests \$26, Students \$10.

Cash Bar @ 6 pm

Dinner @ 7 pm

Talk @ 8 pm

For dinner selection, indicate if a low-salt or vegetarian meal is required. Please cancel if you are unable to attend.

## Announcements

Jan Rasussen, Ph.D., formerly with SRK Consulting, Tucson, is to be congratulated on her recent appointment as Museum Curator with Arizona Department of Mines and Mineral Resources in Phoenix. We know she will be most successful in her new endeavor!

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The Arizona Geological Survey soon will begin offering AGS publications for sale in their bookstores in Phoenix and Tucson. Their prime downtown locations in both cities will provide a fine opportunity for many people to have a greater exposure to "things geologic," as Wes Pierce was fond of saying, and it will provide an exceptional venue for our publications.

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The Arizona Department of Mines & Mineral Resources announced the release of their Open File Report 07-25, *Checklist of Arizona Minerals*, by Dr. Raymond W. Grant.

The format for the checklist is similar to that used in the third edition of *Mineralogy of Arizona* (Anthony, et al., 1995). Mineral names in the list indicate mineral species found in Arizona. Additional localities are provided for some minerals previously found at only one area in the state, and minerals that have been added to the list since the third edition of *Mineralogy of Arizona* are identified.

Copies are available at the department at 1502 W. Washington, or they may be ordered. The price is \$15 plus \$6.50 shipping and handling, if mailed.

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Digest 22, which will present papers on talks given at the O&O symposium, is on track. The tectonics section has received 15 manuscripts and the economic geology section has received 15. The digest is scheduled for publication in 2008.

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## Geology.com

geology.com is a website with interesting features that make it worth checking periodically. Much of the site is aimed at a popular audience but that is not always a bad thing when we have friends or their children we wish to introduce to geology. The site has the following directories: dictionary, news, US maps, world maps, satellite images, careers, time and store.

One link takes you to the highest point in each of the 50 states. Another goes to a zoomable, Google-Earth map of the San Andreas fault, which is fun and happily includes a link to an article on the fault. All of the news articles are geology related. The dictionary is a bit too popular. The time directory includes a printable Geologic Time Scale, definitions of eons, eras, etc. and links to other geologic-time sites.

# S YMPOSIUM WRAP-UP

January—Part 3

Major financial support for the Symposium was provided by Freeport-McMoRan Copper and Gold Inc., BHP-Billiton Inc., Rio Tinto, Bell Resources Inc., Exxon-Mobil, Newmont Mining Corporation, Anglo American, Asarco, Coeur (The Precious Metals Company), Augusta Resource Corporation, SRK Consulting, Errol L. Montgomery and Associates, Clear Creek Associates, and Geotemps. Other corporate contributors included Resolution Copper Mining, International Royalty Corporation, Goldfields, Newcrest Resources Inc., Redhawk Resources, Galway Resources, Vane Minerals Group, Bronco Creek Exploration Inc., SWCA Environmental Consultants, Skyline Assayers and Laboratories, Stewart Brothers Drilling Co., Auric Resources International, and Conners Drilling.

The AGS thanks all of these companies and associated individuals for their generous support and hard work, and especially the many volunteers and attendees who made this Symposium the premier geological conference of 2007.

**O&O Symposium donations totaled  
\$155,555.55.**

**Theories are not so much wrong as incomplete.**

**— Isaac Asimov (1920-1992)**

# *Best Wishes to our Members for the Holiday Season and All of 2008*

from the Officers and Councilors of AGS

## U.S.G.S. Photographic Library

The U.S. Geological Survey maintains a photographic library on the internet with over 400,000 photographs taken between 1868 to the present. The photos and captions are available to download.

Searches can be made on keywords (the name of a person, survey expedition, date, geographic or geologic feature, or major geologic event); an earthquake; mines, mills, quarries; Mount St. Helens; National Parks; pioneer photographers; photographers; and photographs.

Each image is available to download in the following resolution choices:

- 100 dots per inch (dpi) thumbnail-resolution GIF files
- 700 dpi medium-resolution JPG file
- 1400 dpi high-resolution JPG
- 1600+ dpi full-resolution JPG file

Excellent instructions are included. Visit the U.S.G.S. website: <http://libraryphoto.cr.usgs.gov/index.html>.

## CALENDAR OF EVENTS

- **February 5, 2008**—ALYSON THIBODEAU, University of Arizona: *The Strange Case of the Earliest Extraction of Silver by European Colonists in the New World*
- **03-04-2008**—MARK BARTON, University of Arizona: *Iron Oxide Copper Gold Deposits: A Cordilleran Perspective*
- Visit the AGS web site for upcoming speakers and the spring field trip.

**Please make your dinner meeting reservation BEFORE Friday, January 4, 2008. Call 520-663-5295 today!**

## Let There Be Light!!

By Dr. Jan C. Rasmussen, Curator

Arizona Mineral Museum

Arizona Department of Mines & Mineral Resources

Over 24,000 school children (150 to 250 per school day) and 16,000 adults visit the museum each year. That's a lot of potential voters and supporters of minerals and mining!

We need to better present the message about the value and beauty of minerals and mining to our society. However, the state only supplies [the museum with] one salary and rent. All other expenses are covered by donations from individuals and organizations, volunteer workers, and profits from the gift shop.

## How Can You Help?

- Light bulbs for cases (high intensity, daylight, UV protected) @ \$10/case x 50 = \$5,000.
- New cases (8 large cases @ about \$5,000 per case, and 10 smaller cases @ about \$4,000 per case, for a total of \$74,000). Get your name on one or more new cases as the donor!
- Renovate the old 1940s cases with new doors @ \$2,000 per case for 17 cases = \$34,000. (Currently it takes two strong men and an electric screw driver to get into a case to dust it or change the light bulbs.)

Whether you can donate \$10 or \$1,000,000, please help get the message out about the value of minerals and mining.

Your donation is tax deductible. Call Jan Rasmussen at 602-771-1612.

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ABOUT THE  
ARIZONA GEOLOGICAL SOCIETY  
AND UPCOMING EVENTS  
VISIT OUR WEBSITE  
www.arizonageologicalsoc.org

AGS books and maps are sold at the monthly dinner meeting and by the Arizona Geological Survey. Visit the AZGS website www.azgs.state.az.us and click on Non-AZGS Publications



*As always, please keep us up to date as you move, change jobs, or change your e-mail address.*

**2008 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM**

Please mail check with membership form to: Arizona Geological Society, P.O. Box 40952, Tucson, AZ 85717. Dues (circle one): 1 year: \$15; 2 years: \$30; 3 years: \$40. Full-time students receive free membership (E-mail only). However, a membership application form must be returned to AGS annually to remain on the membership list.

**Renew before 2008 to take advantage of 2007 membership dues.**

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Street City State Zip Code

Work Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

Fax Number: \_\_\_\_\_ Cellular Phone: \_\_\_\_\_

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Please send the newsletter by E-mail only  by regular mail only  by E-mail AND regular mail

If registered geologist or engineer, indicate registration number and state: \_\_\_\_\_

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