



AGS NEWSLETTER

ARIZONA GEOLOGICAL SOCIETY, INC. FEBRUARY 2006

DINNER MEETING SPEAKER FEBRUARY 7, 2006

P. JONATHAN PATCHETT, DEPT. OF GEOSCIENCES, UA
CONTINENT-SCALE SEDIMENTARY MOVEMENTS IN NORTH AMERICA
FROM 600 TO 80 MA USING Nd ISOTOPES

ABSTRACT: Of the isotopic techniques available to study provenance of sedimentary materials, Sr isotopes cannot document clastic provenance because of fractionation of Rb and Sr in weathering, transport, and deposition. U-Pb ages of zircons and monazites are very powerful indicators for the age of grains within sandstones, but do not usually speak to the main mass of fine-grained clastic material. Rare-Earth Elements (REE), and in particular the Nd isotopic signal embedded in the REE, can deliver an estimate of the age of the bulk of the clastic sedimentary material. Nd cannot, however, distinguish individual age components in a sedimentary rock. Ideally, the maximum number of techniques should be applied to the same sequence. One such example from the Cordilleran foreland sequence in western Canada will be presented in the later part of the talk.



Nd isotopes can be used to show the gross patterns of sediment movement over North America from Neoproterozoic to Cretaceous time. The continent was generally emergent from 600 to 450 Ma, with dominant "local" provenances on a scale less than about 1,500 km. Around 450 Ma, the clastic sedimentary budget of North America was overwhelmed by material derived from Paleozoic mountains in Greenland (Caledonian), the Canadian Arctic (Franklinian) and the eastern side of Canada and the USA (Taconian, later Appalachian). The extensive cover delivered from these mountains persisted long after the mountains themselves had been eroded down, and dominated sediment supply everywhere until about 150 Ma. At 150 Ma, the North American Cordillera began to deliver a new pulse of detritus with a different average age and Nd composition. This regime continues today, and will be "complete" only when a continental collision has occurred along the Pacific margin of our continent.

It is interesting to discuss which is the "normal" condition of the North American Precambrian shield - mostly emergent as today, or mostly covered with sedimentary rocks as it was from 450-150 Ma? It is also interesting to compare our continent to one like northern Asia (the Russian platform, much of the Baltic Shield being buried underneath it). What epeirogenic movements may regulate these continental elevations, and how are they produced? Dr. Patchett can be contacted at patchett@geo.arizona.edu or (520) 621-2070.

Dinner Meeting Schedule:

Note change in location this month only: Four Points by Sheraton, University Plaza (Conference Center) 1900 E. Speedway Blvd. in Tucson

Cash Bar @ 6 pm Dinner @ 7 pm Talk @ 8 pm

Cost: With reservation: Members \$20, Guest \$22, Students \$7 Without reservation \$2 additional. Please call (520) 663-5295 by 5 pm **February 5th**. Indicate if a low-salt or vegetarian meal is required. Please cancel if you are unable to attend.

CALENDAR OF EVENTS:

- Feb. 9-12 Tucson Gem & Mineral Show
- Feb. 15 Symposium Committee meeting, 5:30pm at ENRB Rm. 335
- Mar. 7 Dinner Meeting Patrick Leahy, USGS
- April 4 Dinner Meeting Amanda Clarke, ASU, Physical Volcanology

Member News:

Welcome to new members **Carolyn Cooper**, *Western Technologies*, **Raul Osete, Jr.**, *Osete International Builders*, *Alyson Thibodeau*, *UA*, and new institutional member **Lee Allison**, *Arizona Geological Survey*. We also have some new officers and councilors on board. **Richard Lundin**, *Carothers Environmental* is replacing **Geoff Gerwe** as Vice President of Field Trips and **Alyson Thibodeau** is replacing **Jeff Manuszak**, *Malcolm Pirnie* as Councilor 3 (04-06). Jeff has been transferred to Washington D.C.

Dues for 2006 calendar year are due if your mailing label says "05" on it. Please consider a donation to the Courtright Scholarship Fund or to support the AGS Symposium in 2007 while you are filling out the renewal. Students - please update your mailing information.



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AGS books & maps are sold at the
dinner meetings and by the
Arizona Geological Survey.

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Jerome District "Flu" Situation - In Jerome the situation was quite bad, there having been over 900 cases of influenza and 82 deaths. At present the epidemic is well under control and only 7 case are under treatment, most of these being convalescents from pneumonia. Arizona Mining Journal, December 1918, v. II, no. 7.

2006 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, P.O. Box 40952, Tucson, 85717

Dues (check box) 1 year: \$15; 2 years: \$30; 3 years: \$40; full-time student (membership is free)

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

Enclosed is a _____ tax-deductible contribution for the 2007 AGS Symposium.