Mongolia 2009

Paleobiogeographic Reconstruction of the Gobi-Altai Terrane, Mongolia

**What:** Mongolia occupies a key position for unraveling the complex geologic history of central Asia, which formed through the accretion of “exotic” crustal fragments in the late Paleozoic-early Mesozoic. Students involved in this project will contribute new geologic data about the Gobi-Altai terrane in southern Mongolia - its sedimentary history, evolution of its invertebrate communities, and paleogeographic setting.

**When:** 18 July – 14 August 2009

**Where:** Three weeks of field work in the Gobi Desert (where we will camp in tents) will commence after three days of overland travel from Mongolia’s capital, Ulaanbaatar.

**Who:** Eight Keck students and four faculty: Professors Constance Soja (Colgate University), Paul Myrow (Colorado College), Jeff Over (SUNY-Geneseo), and Minjin Chuluun (Mongolian Technical University).

**Project Description and Goals:** We will investigate the paleontology, stratigraphy, and sedimentology of Ordovician-Silurian deposits exposed in the Gobi-Altai terrane of southern Mongolia. Joint work with a Mongolian colleague and his students will involve mapping and sampling of sedimentary rocks (primarily limestone but also interbedded clastic and volcanic units) and fossils from stratigraphic sections. Compilation of sedimentary (petrologic and petrographic), magnetic susceptibility, and paleontologic data will be the basis for determining the environmental setting, paleoecology, and faunal affinities of the biotas.

Hillside exposure of Silurian limestone and shale in the Gobi-Altai terrane (arrow points to person for scale).
**Student Projects:** Student projects focusing on Ordovician-Silurian fossils, depositional environments, and provenance indicators will allow the Gobi-Altai terrane’s geologic history to be better constrained. Specific topics will be determined in the field based on the student’s interest, academic preparation, and lab facilities at the home institution. Students will be expected to undertake some laboratory analyses during completion of their research projects in the 2009-2010 academic year.

- Paleocology of Ordovician v. Silurian brachiopod, bryozoan, coral, or sponge-dominated assemblages
- Silurian stromatolite communities
- Ecologic succession in Lower Silurian stromatoporoid biostromes
- Depositional setting of interbedded Upper Silurian limestone and shale
- Age and provenance of detrital zircons in Ordovician v. Silurian sandstone
- Clast provenance and origin of Lower Devonian limestone breccias
- Correlation of stratigraphic sections based on magnetic susceptibility patterns and (or) conodont zonation
- Age dating and geologic implications of interbedded volcanic units

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**Field Conditions:** Unvegetated rocks at our study sites are well preserved, fossiliferous, and accessible along continuous exposures under safe field conditions. Students should be in good physical shape for hiking up ridges and carrying rock samples back to camp. Temperatures during the day will be in the 80’s and 90’s (F) and drop to a comfortable 50’s-60’s at night. Apart from preparation of simple vegetarian and meat-based meals, no special diets can be accommodated. Minimal insects and no snakes, but the
occasional scorpion may be spotted. On the journey back to Ulaanbaatar, we will spend time exploring the “Flaming Cliffs,” a site of stark beauty that is world famous for its dinosaur egg deposits.

**Course Preparation:** Students should have completed the junior year and have taken at least one course in Sedimentology/Stratigraphy or Paleontology. Previous experience in the field or at a field camp is desirable. Additional course work in Historical Geology, Structural Geology, and Biology will be helpful. This is a once-in-a-lifetime experience for adventurous students who are eager to explore one of the last unchanged places on Earth. Flexibility when working with others and interest in being part of a group keen to learn from our Mongolian colleagues about the local culture are essential. We will have opportunities to sample local delicacies, including airag (fermented mare’s milk), camel-milk cheese, etc., to visit (possibly) a Naadam event showcasing archery, wrestling, and horse-racing competitions, and to learn about the legacy of the great Mongolian leader, Chinggis Khaan (Genghis Khan). Recommended reading (*In The Empire of Genghis Khan* by Stanley Stewart, 2002) and documentary film (*The Story of the Weeping Camel* – available thru Netflix).

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