

## GEOSCIENCE NEWSLETTER

Number 18 July 2009

### 2009 GRI FIELD SCHOOL



*Field School participants enjoy the opening banquet.*

More than sixty individuals participated in the Teachers' Field School hosted by the Geoscience Research Institute from July 12-23, 2009. The group included teachers, educational administrators, lecturers and a few guests. A special feature of this tour was the international flavor, with participants from such places as Ghana, Taiwan, Iceland, Brazil and Argentina.

The tour began in Denver, Colorado with a geology lab exercise, an opening banquet (see photo above) and some introductory lectures. From there, the group moved to Golden, at the western edge of Denver, close to several interesting field sites such as Dinosaur Ridge and Red Rocks Amphitheater. They also



*Field School participants tour the Argo Gold Mine in Idaho Springs.*

visited the US Geological Survey Earthquake Center and the Denver Museum of Nature and Science.

A special all-day field trip took the group to see Garden of the Gods in Colorado Springs, and the famous Florissant Fossil Beds National Monument. A privately-run commercial quarry provided an opportunity for each participant to search for their own fossils, primarily fossil insects and plants.

From Golden, the group moved westward to Eagle, Colorado to see evaporites, turbidites, examples of unconformities and other geological features.



*Special planning of the field trips was necessary because of the large number of participants. Half the group visited one site while the other half visited a second site, then they traded places.*

The group returned to Denver via Rocky Mountain National Park, where they could see the results of glaciation and enjoy the spectacular scenery. For those able to come, the Field School was a great way to spend a part of the summer. The next Field School is expected in summer of 2013 or 2014.

*Geoscience Newsletter* is an e-publication of the Geoscience Research Institute, 11060 Campus Street, Loma Linda CA 92350 USA.

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*The Gloria Patri group meeting in northern Italy.*

### "GLORIA PATRI"

From 4-8 June, 2009, Ben Clausen and Jim Gibson participated in the second Gloria Patri conference on faith and science, held in Bobbio Pellice, Italy, site of the headquarters of the Waldensian church of Reformation fame.

At least six countries were represented, providing opportunity for cross-cultural exchange of ideas in the realm of faith and science. The Conference was organized by Karen Abrahamson and Kathy Demsky of Andrews University, and co-sponsored by Geoscience Research Institute, the Faith and Science Council, and Andrews University.

The next meeting is scheduled for September, 2010, in Germany. Check future newsletters for more information.



*Gloria Patri participants worship in a Waldensian cave.*

## SCIENCE NEWS

### Does Speciation Require Physical Barriers?



These alpine buttercups are one of many similar species in different regions. (Photo taken in Rocky Mt National Park)

Aguiar, M.A.M. de, M. Baranger, E.M. Baptestini, L. Kaufman, Y. Bar-Yam. 2009. *Global patterns of speciation and diversity*. *Nature* 460:384-387. doi:110.1039/nature08168

**Summary.** Computer simulations suggest that physical geographic barriers are not needed for new species to form. Classic allopatric speciation theory holds that speciation normally results when a physical barrier prevents reproductive exchange. Genetic differences accumulate as the isolated populations experience different environmental selective pressures and different mutations. Eventually, the genetic differences become large enough to prevent interbreeding if the populations should happen to come in contact. Speciation has occurred.

Computer simulations indicated that genetic differences can accumulate and produce new species without physical barriers. The computer simulations successfully predicted mathematical relationships consistent with those seen in nature, such as speciation rates, species-area relationships and species abundance distributions.

**Comment.** Computer simulations are not the real world, but these results are interesting because they are consistent with creationist expectations that multiple speciations may occur simultaneously rather than sequentially. A species that is rapidly dispersing after a global catastrophe might first spread over

a large area, then divide into numerous species in a relatively short time. This would produce a large number of species in a short time, whether or not separated by physical barriers.

### Dinosaurs: Bird Ancestors?

James, FC and JA Pourtless IV. 2009. *Cladistics and the origin of birds: A review and two new analyses*. *Ornithological Monographs* 67:1-78. (See [www.evolutionnews.org/2009/06](http://www.evolutionnews.org/2009/06))

**Summary.** The hypothesis that birds evolved from theropod dinosaurs is not as well supported as its advocates often claim. At least five evolutionary hypotheses have been proposed for the origin of birds but this is the first time they have been compared cladistically.

Results showed that three hypotheses were approximately equal in statistical



A Cretaceous fossil bird, located in the Geological Museum of China, Beijing. Photo by Ben Clausen.

support. These include the theropod ancestry of birds, the archosaur ancestry of birds, and the crocodylomorph ancestry of birds. The theropod-bird hypothesis has never been tested previously, and did not explain the data any better than the two other hypotheses. Oviraptors, dromaeosaurs and troodontids may not be theropods at all, but secondarily flightless birds. More data and cladistic analyses are needed to test among these hypotheses.

**Comment.** Similarities among living groups, such as birds, do not necessarily indicate a single common ancestry, still less so similarities between birds and fossils such as dinosaurs or other groups of archosaurian reptiles. The vigor with which the theropod-bird hypothesis is promoted does not appear to be justified by this evolutionary analysis.

### Long-lived Proteins?

Schweitzer, MH, et al. 2009. *Biomolecular characterization and protein sequences of the Campanian hadrosaur B. canadensis*. *Science* 324:626-631. (See other references listed at <http://grisda.org/site/1/news/news.htm>)

**Summary.** Original molecules of collagen have been found preserved in a bone of the hadrosaurian dinosaur, *Brachylophosaurus canadensis*. Previous studies had shown soft-tissue preservation in a *Tyrannosaurus rex* bone, but some scientists were skeptical that such preservation was possible for a specimen thought to be 65 million years old.

The hadrosaur bone from sandstones of the Judith River Formation in Montana, USA, was dated at 80 million years. Extra care was taken to prevent contamination, and samples were analyzed by several independent laboratories. Antibody binding indicated the presence of collagen, along with small amounts of laminin, elastin, and hemoglobin.

Sufficient collagen was recovered to permit obtaining a partial amino acid sequence for the protein. When compared with other species, the dinosaur collagen was most similar to that previously reported for *T. rex*, with birds the next closest group.

**Comment.** Preservation of protein within fossils for millions of years seems so unlikely that it should cause one to wonder if the fossil material might be far younger than usually thought. Repeated confirmation of such preservation should convince all that it is real, and not just an experimental artifact.



A hadrosaur, or duck-billed dinosaur in the Denver Museum of Nature and Science.