

GEOSCIENCE NEWSLETTER

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GEOSCIENCE 2006 FIELD CONFERENCE



Participants in the 2006 Field Conference.
Photo courtesy of Lee Davidson.

The Geoscience Research Institute 2006 Field Conference for Church Leaders was conducted in Colorado from August 20-31. About 37 administrators and scholars, representing half a dozen different countries, participated in the trip. The trip featured more than twenty lectures, and over a thousand miles of travel and field observation.

The group visited numerous field sites during the trip. One of the most



Folded and faulted sediments at Harper's Corner. Photo by Ben Clausen.

spectacular views was at Harper's Corner in Dinosaur National Monument,

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where the Yampa River flows into the Green River. At this point, the Mitten Park Fault marks the location where rocks to the west were broken and uplifted about 900 m (3000 feet) as the Uinta Mountains were formed. In the uplift process, some rocks were folded and truncated, as seen in the photo.



Upturned turbidite beds near McCoy, Colorado. Photo by Jim Gibson.

Another reminder of the powerful forces that have acted in Earth's crust is shown in the photo above. Here, a series of turbidites in the Minturn Formation (Pennsylvanian) have been tipped up on end. Turbidites are formed under water as sediment in suspension flows rapidly into a basin and is deposited.

Other sites gave evidence that seems to point to more ordinary processes at work. Stromatolites are believed to form as a succession of algal mats forms and traps sediment, forming a succession of thin layers. Although there has been controversy about whether some stromatolites were produced in this way, or by some inorganic process, the biological origin is accepted by most geologists.

Along the tour, a series of lectures provided background information on geological processes and how fossils form. Other lectures addressed numer-



Stromatolite layers in the Permo-Triassic Lykins Formation in Red Rocks Park, just west of Denver. Photo by Ben Clausen.

ous issues in geology, paleontology, biology, cosmology, and Biblical studies. The Conference ended with a review of various models of origins that have been proposed, none of which has successfully explained everything we see in nature. The participants were urged to adopt an attitude of humility in recognition of our inability to know everything, to keep an open, but critical mind, and to intentionally choose to maintain faith in Scripture, despite our lack of understanding.

GRI Website

More photographs of field sites visited on this conference can be found on our website: <http://www.grisa.org/colorado>.

NEW BOOK ON GENESIS

Review & Herald recently released *The Book of Beginnings: Creation and the Promise of Redemption*, coauthored by Ben Clausen of GRI. The book is intended as a commentary to accompany the Bible Study Guides for the fourth quarter, 2006, and is available for \$10.99 at <http://www.adventistbookcenter.com>.

RESEARCH NEWS

Raúl Digs Spanish Whales

Under the sponsorship of the Andalucía (southern Spain) Regional Government, Dr. Esperante worked in collaboration with a Spanish paleontologist on the excavation and study of a fossil whale during June and September.

Fossil whales are relatively common in southern Europe, especially Spain and Italy. The whale was found in a trench along the road. Excavation required the work of five paleontologists, and was followed by detailed cleaning and exami-



Raúl Esperante cleaning whale bones.

nation of each bone, along with study of the associated sediment.

Numerous oyster shells were found associated with the skeleton, indicating deposition in a shallow water marine environment. Most of the bones are well preserved, but some show destruction by the activity of marine organisms that fed on the fat-rich cetacean bones before burial. Fossil fish bones and shark teeth in the same sediment indicate a rich fauna inhabited this area.

After cleaning and preparation are completed, this whale specimen will be mounted for display in a natural history museum scheduled to open to the public in 2007.

SCIENCE NEWS

Controlling Beak Size & Shape

Abzhanov A, Kuo WP, Hartmann C, Grant BR, Grant PR, Tabin CJ. 2006. The calmodulin pathway and evolution of elongated beak morphology in Darwin's finches. *Nature* 442:563-567.

Summary. Darwin's finches of the Galapagos Islands comprise a group of 14 closely related species, with major differences primarily in their beaks. The ground finches, genus *Geospiza*, illustrate these differences especially well. The molecule, calmodulin, is produced at higher levels in *Geospiza* species with long beaks than in those with short beaks.

Experimental manipulation of calmodulin production in chickens confirmed its effects in elongation of the upper beak. This finding shows that small changes in gene regulation might account for beak morphological divergence in the Galapagos finches.

Comment. This invaluable example can help explain how the Galapagos finches have diverged morphologically. Beak size and shape is a key character

in identifying different types of birds, and this study may help illuminate how some of these differences originated.



A cast of a skull of *Australopithecus afarensis*.

Australopithecine Juvenile

Alemseged Z, Spoor F, Kimbel WH, Bobe R, Geraads D, Reed D, Wynn JG. 2006. A juvenile early hominin skeleton from Dikika, Ethiopia. *Nature* 443:296-301.

Summary. An *Australopithecus afarensis* fossil estimated to have been about three years old when it died has been discovered in Pliocene sediments in Ethiopia. The specimen was found in a fossilized channel near where a river flowed into a lake. The lower part of the skeleton indicates ability to walk on two feet, while the upper part of the skeleton indicates ape-like arboreal locomotion.

Comment. This find confirms both the predominantly ape-like nature of australopithecines and their possession of some human-like features. This combination of features is not found in living

species, and australopithecines apparently represent an extinct ape-like creature.

Jumping Genes Promote Speciation

Masly JP, Jones CD, Noor MAF, Locke J, Orr HA. 2006. Gene transposition as a cause of hybrid sterility in *Drosophila*. *Science* 313:1448-1450.

Summary. The gene JYAlpha in *Drosophila* is required for sperm motility and thus male fertility. Two species of *Drosophila*: *D. simulans* and *D. melanogaster* can hybridize, but some of the males are sterile. The cause of this sterility is that JYAlpha resides on chromosome 4 of *D. melanogaster*, but on chromosome 3 of *D. simulans*. Hybrid males with *D. simulans* chromosome 4 and *D. melanogaster* chromosome 3 will lack JYAlpha and are sterile. The different location of JYAlpha in the two species is attributed to movement of the gene between the chromosomes.

Comment. Movable elements — transposons — are DNA sequences that tend to move around in the genome, potentially carrying genes to new locations. Movable elements are a major cause of mutations in *Drosophila* and stress increases the activity of movable elements. Given these results, it seems plausible that rapid speciation might result from gene transposition triggered by environmental stress.



Geospiza difficilis, one of the Galapagos ground finches. Photo by Tim Standish.