GEOSCIENCE NEWSLETTER

Number Five May, 2006

Directors of the five international GRI branch offices and affiliates. (From left): Dr. Marcia Oliveira de Paula; Dr. Choi Chung Geol; Dr. Jacques Sauvagnat; Dr. Antonio Cremades; Dr. Roberto Biaggi.

INTERNATIONAL GRI GROUP MEETS IN LOMA LINDA

In April GRI hosted meetings with the five international directors of its Branch Offices and Affiliates. The group shared ideas and plans, and explored some of the interesting geology of southern California.

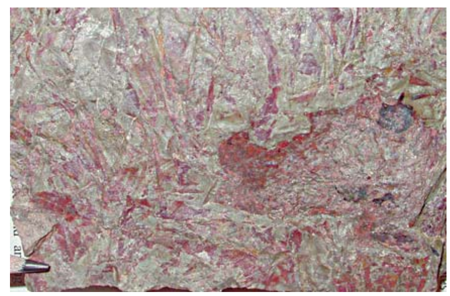
A large fold in marine turbidites of the Mio-Pliocene Latrania Member of the Imperial Group. Note Dr. Roberto Biaggi standing on the right for scale.

One field trip visited Split Mountain in Anza-Borrego State Park, located just west of the Salton Sea in southernmost California. This area forms the margin between the Pacific Plate and the North American Plate. Neogene movement between the two plates has caused faulting and high rates of sedimentation, sometimes producing spectacular sedimentary exposures.

GRI group at Bristol Dry Lake, noted as a major source of table salt. Although the lake bed is covered with a layer of salt, most of the salt is a few feet below the surface.

A second field trip was to the Mohave Desert, where the group made several stops. including the salt deposits at Bristol Dry Lake, the volcanic vent at Amboy Crater, and Dish Hill, where magma has brought minerals to the surface from the earth's deep interior.

A final stop was in the Marble Mountains, where trilobites are found in the Cambrian Latham Shale.



Trilobite "hash" fragments in Cambrian shale in the Marble Mountains. Note pencil point for scale (lower left corner).

NEW GRI BRANCH OFFICES ESTABLISHED

Two new Branch Offices were approved by the Geoscience Research Institute Board at its meeting in February 2006. The new branch offices are in Mexico and Korea.

Dr. Antonio Cremades is the Director of the Branch Office at Montemorelos University. He previously served as Director of the Branch Office located at Universidad Adventista del Plata, in Argentina. His specialty is in physical anthropology.

The Korean Branch Office is led by Dr. Choi Chung Geol and is located at Sahmyook University in Seoul, Korea. Dr. Choi is a geologist with interests in fossils and sedimentology.

Together with the branch offices in Argentina (led by Dr. Roberto Biaggi) and France (led by Dr. Jacques Sauvagnat), there are now a total of four branch offices.

A fifth center, in Brazil, was recognized by the GRI Board in 2005 as an Affiliate of GRI. The Brazilian group is led by Dr. Marcia Oliveria de Paula, whose specialty is microbiology.

GEOSCIENCE WEBSITE

Frequently Asked Questions (FAQ)

In response to questions regarding the issues in the interface between science and faith, we have posted a FAQ at http://www.grisda.org/.

The FAQ contains questions on 12 different topics, including dinosaurs and other fossils, the age of the earth, change in species, and the Bible and science. The FAQs have been useful to many individuals with general questions about faith and science.

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SCIENCE NEWS

Fish-A-Pod?

Daeschler EB, Shubin NH, Jenkins FA. 2006. A Devonian tetrapod-like fish and the evolution of the tetrapod body plan. Nature 440:757-763. Shubin NH, Daeschler EB, Jenkins FA. 2006. The pectoral fin of Tiktaalik roseae *and the origin of the tetrapod limb. Nature 440:764-771.*

Summary. These articles describe the discovery of a new fish with certain skeletal features that resemble tetrapods such as amphibians and reptiles. The fossil was found in the Fram Formation of Ellesmere Island, in Arctic Canada.

Tiktaalik is the latest discovery of a Devonian fish with intermediate traits. Complete skeletons have been discovered, making it easier to see the intermediate nature of several of its traits. *Tiktaalik* shows several features intermediate between fish and tetrapods, including a flattened head and body, with dorsal eyes and marginal nostrils.

Tiktaalik also shows more tetrapod-like features than its closest relatives: the expanded, overlapping ribs, the smaller number of skull bones, the freedom of the head to move independently of the front fins, and the structure of the pectoral fins.

Comment. Fish such as *Tiktaalik* and *Panderichthys* (see photo) have features of interest to creationists. First, they show that present biodiversity does not reflect all the diversity that once existed; many types of organisms have gone extinct. Also, they show that morphological patterns now used to distinguish fish from tetrapods may not apply to all fossils.There once were fish that had combinations of traits not seen in any living organism. These may well represent animals living in habitats that do not exist today.

A model of Panderichthys, *a Devonian fish with tetrapod-like traits, from Latvia. Photo of model in North American Museum of Ancient Life, Lehi, Utah.*

Another point of interest is how to respond to claims that fossils such as *Tiktaalik* demonstrate that fish are ancestral to tetrapods. The existence of similar species does not show that one is derived from the other. The possibility of independent ancestry is not ruled out by the discovery of similarities.

The most convincing data to show an ancestral relationship would be experimental. If it could be shown experimentally that small genetic changes can produce viable major morphological changes such as distinguish fish and tetrapods, this would be important evidence in favor of common ancestry. Discovery of a relatively complete series of transitional fossils would add weight to the argument. The "series" of transitional fossils leading to tetrapods remains sketchy at best. The attention given to this discovery is a reminder of how rare such fossils are.

Tiktaalik is one of a small group of Devonian fossils showing combinations of traits not seen in any living species. Devonian sediments are noted for their diversity of fish, a diversity that tends to increase with new discoveries.

Chicken Teeth

Harris MP, Hasso SM, Ferguson MWJ, Fallon JF. 2006. The development of archosaurian first-generation teeth in a chicken mutant. Current Biology 16(4): 371-377. http://www.grisda.org/links/0602

Summary. A chicken embryo has been discovered with developing teeth. Living birds do not have teeth, but experiments have indicated that the genes for teeth may still be present in birds. The discovery of teeth forming in a chicken embryo confirms this. A change in relative position of a regulatory sequence may have left the gene for tooth development inactive but still functional.

Comment. Some Cretaceous birds had teeth, but no Cenozoic fossil birds with teeth are known. Cretaceous fossils were probably deposited during the Flood, so only toothless birds have existed since the Flood. Survival of an inactive gene for thousands of years seems remarkable; survival of such a gene for millions of years, as evolution theory requires, seems implausible.

Chickens lack teeth, but have a gene for making teeth.

Featherless Dinosaur

Gohlich UB, Chiappe LM. 2006. A new carnivorous dinosaur from the Late Jurassic Solnhofen archipelago. Nature 440:329-332. http://www.grisda.org/links/0603

Summary. The Solnhofen Limestone is famous for being the location where *Archaeopteryx* was discovered, along with a similarly sized theropod dinosaur *Compsognathus*. This article reports discovery of a second, slightly larger theropod dinosaur which has been named *Juravenator*. The new find is related to *Compsognathus* and *Sinosauropteryx*, the latter from China. *Sinosauropteryx* has feathers on its tail and hindlimbs, and so *Juravenator* would be expected to have feathers also. However, a patch of preserved skin around the tail and hindlimbs of *Juravenator* shows the presence of rounded tubercles and no trace of feathers. This finding suggests that the relationship of feathers and dinosaurs is more complex than has been realized.

Comment. Creationists have never considered all birds to have a common ancestry. Feathers were created on a number of independent lineages. Theropod dinosaurs may represent one or more of these lineages, now extinct. The excellent preservation of *Juravenator* provides a rare glimpse of dinosaur skin, and reminds us of the dangers of inferring the characteristics of a species based merely on the characteristics of similar species.