GEOSCIENCE NEWSLETTER

Number Three October, 2005

GRI RESEARCH REPORTS

Dr Tim Standish in his laboratory.

Dr. Tim Standish presented a paper, "A new molecular tool for investigation of inter and intra baramin variation" at the meetings of the Baraminology Study Group, held in Moscow Idaho, June 15-17. Dr. Standish's paper addressed the question of how DNA sequences might be used to help identify separately created lineages, as well as changes within a lineage since its creation. An abstract of the paper is posted at http://www.bryancore.org/bsg/opbsg/005.pdf.

FIELD CONFERENCE

GRI will conduct a Field Conference for SDA Church leaders in August, 2006. The Conference will begin and end in Denver, Colorado, and will include a tour of several significant features in the Rocky Mountains. Dr. Ben Clausen is coordinating the details for the tour.

Stalactite in Glenwood Caverns, near Glenwood Springs, Colorado. Photo by Ben Clausen.

Dr. Raúl Esperante attended the 2nd International Meeting TAPHOS, held in Barcelona, Spain, June 16-18, where he presented a poster titled "How not to become a fossil —Taphonomy of modern whale falls." The poster illustrates decay of modern whale skeletons on the seafloor and how that information helps understand the fossilization process of ancient specimens.

Dr Esperante with his poster in Spain.

GRI WEBSITE

Our semi-technical journal, *Origins*, was started in 1974 to provide an outlet for research that might contribute to a creation-based interpretation of earth history. Fifty-eight issues have been published to date.

Origins has included a number of articles dealing with scientific issues. Research topics include determining separately created lineages, relating the geological column to the flood, and identifying evidence of design.

Several articles have analyzed portions of the text of Genesis 1-11. Topics have included the days of creation, comparison of Genesis 1 & 2, and Noah's flood. An index to the articles is available on our website at http://www.grisda.org/origins/ndx-yr.

GRI BOOTH AT GENERAL CONFERENCE SESSION IN ST LOUIS

The Geoscience Research Institute presented an exhibition booth at the recent general business session of the Seventh-day Adventist Church, held in St. Louis, Missouri in July, 2005.

The Seventh-day Adventist Church conducts a general business session every five years, at which reports are presented, officers are elected, and policies are voted..

The GRI booth, prepared by Dr. Tim Standish, included a display of photographs of GRI activities, a display of fossils, and a sample of books dealing with science and faith. The exhibit was viewed by many thousands of visitors, who were able to meet members of the GRI staff and discuss ideas concerning creation.

Drs Jacques Sauvagnat (left) and Timothy Standish (right) help represent the GRI at the booth for the General Conference Session in St. Louis.

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SCIENCE NEWS

Chimps in Gombe, Tanzania. Photo by Curt Busse www.curtbusse.com.

Chimpanzee Genome Completed

Chimpanzee Sequencing and Analysis consortium. 2005. Initial sequence of the chimpanzee genome and comparison with the human genome. Nature 437:69-87.

Summary. The chimpanzee genome has been sequenced and found to be about 97% identical with that of humans. Proteins from the two species typically differ by only two amino acids, and are identical in 29% of the cases. Of a total of 3 billion nucleotides, about 35 million single-nucleotide differences were identified. About five million differences in sequence length (indels) were identified, accounting for 1.5% of the genomes. Additional differences between the two species were seen in the activity of transposable elements ("jumping genes"). Some 53 human genes are missing or nonfunctional in the chimpanzee. The greatest genetic differences between the two species appear to be in genes for immunology, sense of smell, and reproduction.

The high degree of genomic similarity raises the question of what makes humans and chimpanzees different. Dogs are highly variable in appearance, but they have very little (0.15%) sequence variation. Two species of mice have sequence differences similar to those distinguishing humans and chimpanzees, but the mice are very similar, while the primates are quite different. Further studies are needed to discover what makes humans unique.

Comment. This study adds to the mystery of what causes different kinds of animals to have different body forms. The DNA has traditionally been considered a kind of "morphological blueprint" or genetic program that directly determines morphology. This, and other studies, raises questions about this view of the role of DNA. Perhaps the DNA simply produces the proteins used in construction, and the source of the "morphological blueprint" has not yet been identified.

Soft-Tissue Preservation in a Fossil Brachiopod

Sutton MD, Briggs DEG, Siveter DJ, Siveter DJ. 2005. Silurian brachiopods with soft-tissue preservation. Nature 436:1013-1015.

Summary: Fossil articulate brachiopods are common, extending down to lower Cambrian strata. While brachiopod valves may be preserved, soft tissue preservation is extremely unusual. In this remarkable Silurian specimen some

Fossil brachiopod. Photo by Dr Tim Standish.

of the visceral mass is preserved, although it appears to have begun to decay before being fossilized. This is unfortunate as this fossilized visceral mass masks many of the traits typically used to classify brachiopods while not providing a great deal of useful information about the internal soft parts.

Of greater interest is the preserved pedicle, which differs from those found in modern related brachiopods. In addition, the lophophore is preserved and its morphology along with the size of this specimen (less than 5 mm wide) suggest that this was a juvenile.

Comment. Fossils with preserved soft tissues imply rapid fossilization, thus these unusual fossils support in general terms the thesis that many fossils were formed over brief time periods. The caution voiced by the authors of this paper when noting the unexpected robust nature of the pedicle and previously unseen rootlet function represents a wise call for skepticism about extrapolation of soft parts from living species to fossils lacking preserved soft parts.

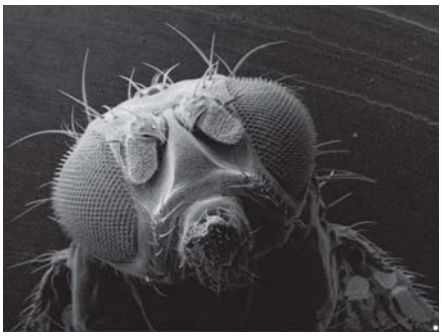
(Contributed by Dr Tim Standish)

Genetic Loss in Insecticide Resistance

Aminetzach YT, Macpherson JM, Petrov DA. 2005. Pesticide resistance via transposition-mediated adaptive gene truncation in Drosophila*. Science 309:764-767.*

Summary. Transposable elements (TE's) are DNA sequences that can move from one place to another within a genome. Insertion of a TE within a functional gene may disrupt or alter the function of the gene. Sixteen insertions of a family known as DOC have been identified in the fruit fly, *Drosophila melanogaster*. One of these, Doc1420, was discovered to insert within a gene known as CHKov1, which appears to affect acetylcholine esterase function. Since acetylcholine esterase is the target of organophosphate insecticides, the flies were tested for sensitivity to these pesticides. Results showed that flies in which the CHKov1 gene was disrupted by Doc1420 had increased resistance to organophosphates. Other cases of insect resistance to pesticides have been attributed to TE disruption of genes sensitive to the pesticides.

Comment. Thus, at least some cases of insect resistance involve loss of sequence specificity rather than increase in complexity. It is not known whether the altered gene has a function.



Scanning-electron micrograph of Drosophila head. Photo by Dr Tim Standish.