RESEARCH HIGHLIGHTS

ECOLOGY

Life after logging

Proc. R. Soc. B doi:10.1098/rspb.2010.1062 (2010)

Take a biodiverse rainforest in Southeast Asia. Log it, let the area regrow, then repeat. What do you have? Not much of ecological value, many scientists would say. As a result, such 'degraded' lands have often been turned into oil palm plantations.

But David Edwards at the University of Leeds, UK, and his co-workers have now found that such twice-logged forests retain a surprising amount of biodiversity. Using birds and dung beetles as proxies for biodiversity, the researchers surveyed 18 sites in Borneo — some never logged, some logged once, some twice. From their nets, traps and by using binoculars, the authors determined that more than 75% of species found in unlogged forests continued to live in doubly logged forests.

D. EDWARDS

BIOTECHNOLOGY

Fuel from microbes

Science **329,** 559–562 (2010)

Many plants, insects and microbes naturally produce small quantities of alkanes and alkenes — long-chain carbon and hydrogen molecules that are major components of fossil fuels. The biotechnology company LS9, based in South San Francisco, California, has pinpointed the biochemical pathway that bacteria use to do this.

Andreas Schirmer and his colleagues have discovered and patented two genes in cyanobacteria that encode enzymes that convert fatty-acid metabolites into fuel-grade alkanes and alkenes. They expressed these genes in the bacterium *Escherichia coli*, fed it glucose, and showed that it secreted diesel-like fuel that did not need any further chemical conversions. The company is currently scaling up this process.

NEUROSCIENCE

Tunnelling brain cells

Neuron **67,** 213–223 (2010)

Developing neurons must migrate relatively long distances in the brain to reach their destinations. To do so, they move through tubes made up of support cells called astrocytes. Researchers now report that the neurons release a signalling molecule to control the formation and maintenance of these 'tunnels'.

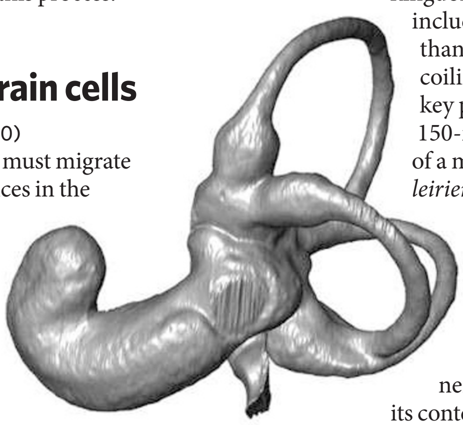
Kazunobu Sawamoto at Nagoya City University in Japan and his colleagues studied neuronal movement in the brain tissue of mice in which the gene for a protein called SLIT1 had been deleted. They noticed slowed neuronal migration. The team also found that the receptors for SLIT1 were expressed in astrocytes and were also required for proper movement. The interaction of SLIT1 with its receptors resulted in a change in the astrocytes' shape and organization, leading to faster neuronal migration.

EVOLUTION

Ear roots

Proc. R. Soc. B doi:10.1098/rspb.2010.1148 (2010)

Some of the best hearing in the animal kingdom belongs to mammals, including humans and bats, thanks to the snail-shaped coiling of the cochlea, a key part of the inner ear. A 150-million-year-old fossil of a mammal, *Dryolestes leiriensis*, has revealed how this key innovation evolved.



The fossil has a bony inner ear structure (pictured) containing auditory nerves, similar to that of its contemporary relatives. But this structure is curved rather than coiled. Zhe-Xi Luo at the Carnegie Museum of Natural History in Pittsburgh, Pennsylvania, and his colleagues suggest that the cochlea was innervated before it evolved into today's curved shape.

ASTRONOMY

Powerful space lens

Astron. Astrophys. doi:10.1051/0004-6361/201014376 (2010)

Brighter than a hundred billion stars combined, quasars — extremely energetic galactic nuclei — typically outshine and obscure everything in their vicinity. Now astronomers have spotted a quasar that acts as a gravitational lens, and have used this property to uncover information about the galaxy that it inhabits.

Malte Tewes at the Swiss Federal Institute of Technology (EPFL) in Lausanne and his colleagues sifted through more than 22,000 potential candidates to find the exotic object, which is about 490 megaparsecs away. With its strong gravitational pull, the quasar redirects and magnifies the light of a galaxy located almost exactly behind it, more than 2,300 megaparsecs away. By measuring the effect of the quasar on the distant galaxy's light, the researchers estimated that the quasar's host galaxy has about 22 billion times the mass of the Sun — a more precise number than could be obtained using previous methods. The technique could help to determine how galaxies form and evolve.

LUO (CARNEGIE MUSEUM) & I. RUF (UNIV. BONN)/R. SOC.