Ecology

Human past and forest present

J. Biogeogr. **30,** 1381–1390 (2003)

Human impacts on tropical rainforests are not necessarily confined to the past few decades, say Barend S. van Gemerden and colleagues. They conclude that the composition of tree species in a present-day African forest is partly a legacy of agriculture several centuries ago.

Different tree species prefer different conditions in their youth. Some are good at establishing themselves in small gaps, such as those created when a single tree falls; others prefer the gaps created by large disturbances — storms or fire, for instance, or human activities. The researchers surveyed 16 one-hectare forest plots in Cameroon. In nine of them, the oldest, biggest trees were known to prefer large-scale disturbance.

The size of these trees suggested that they were 300–400 years old, and the high level of charcoal found in the soil implied that the land was once used by humans — fires are rare in these forests. Van Gemerden and colleagues argue that this view of ecological history should be incorporated into thinking about what constitutes 'pristine forest' and so into conservation planning. **John Whitfield**

Oceanography

No go with the floe

Geophys. Res. Lett. doi:10.1029/2003GL017721 (2003)

C-19 was born in May 2002. This was not an unromantically named baby but a huge iceberg, 32 km wide and 200 km long, that calved from the western Ross Ice Shelf in Antarctica. Kevin R. Arrigo and Gert L. van Dijken used satellite data to track its stately progress through the Ross Sea and, following its grounding near the passage leading to the open ocean, to assess the consequences.

In 'normal ice years', much of the southwestern Ross Sea is clear of sea ice during the austral spring and summer, and the conditions are ideal for the proliferation of phytoplankton. In the 2002–03 season, however, ice piled up behind C-19, reducing the open-water area to about a quarter of the norm. Phytoplankton growth, as measured by chlorophyll concentrations, was ten times less than usual.

An elder sibling of C-19, iceberg B-15, calved and broke up in the Ross Sea in 2000. Although it was even bigger than C-19, its impact on phytoplankton was much less. It is not just size that matters — Arrigo and van Dijken point out that the time and place of iceberg entry into the Ross Sea are crucial determinants of the ecological outcome. **Tim Lincoln**

Neurobiology

The eyes have it

Cell **114,** 545–557 (2003)[1]
Neuron **39,** 919–935 (2003)[2]

What do people, mice and frogs have but adult birds, fish and tadpoles lack? The answer is binocular vision: the ability to produce just one mental representation of images seen, despite receiving input from two eyes. According to Carol A. Mason and colleagues[1], this useful trick relies on a protein called Zic2.

In animals that use binocular vision, each side of the brain must receive information from both eyes. So some neurons (retinal ganglion cells) from the right eye must send projections that cross over the brain's midline into the left hemisphere. Others must project to the same side. Such 'uncrossed' projections are absent in animals that lack binocular vision.

Mason and colleagues now find that Zic2 is expressed in these uncrossed neurons during mouse development — and that when Zic2 is inactivated, there are few or no uncrossed projections. Moreover, animals such as ferrets, which have a higher degree of binocularity and more uncrossed projections, show greater Zic2 expression in the relevant region of the embryonic retina. So this protein seems to determine whether a ganglion cell will cross the midline. As Zic2 is a transcription factor, the next step is to see what genes it might be regulating, and the same group suggests[2] that the EphB1 gene is a candidate. **Amanda Tromans**

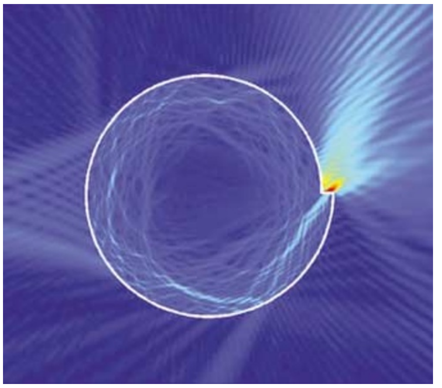
Microphotonics

Tiny laser notches up success

Appl. Phys. Lett. **83,** 1710–1712 (2003)

Microscopic lasers made from semiconductors can be used for photonic and optoelectronic information processing on a chip. Pillar-shaped microlasers can be created from multiple layers of different materials, like a stack of coins. The laser light is stimulated within 'quantum wells', which are formed by thin films of active material sandwiched between layers of another material. It all works nicely, except for the fact that most microlasers with this design produce at least two output beams, whereas a single, unidirectional laser beam is needed to arrange easy optical communication between microlasers.

G. D. Chern *et al.* have now found a way to achieve this in pillar-shaped, quantum-well microlasers. The trick is to carve each layer into the shape of a spiral, rather like the silhouette of a snail shell. The laser light is excited in quantum wells of indium gallium nitride — but in a perfect disk, the light would merely rotate around the well without escaping. The 'notch' in the perimeter of the spiral-shaped layers provides a point of escape. When stimulated with ultraviolet light, the microlaser produces a single violet beam that emerges at an angle of 40° from the normal to the notch. **Philip Ball**



The pillar-shaped microlaser. The colours indicate the varying strength of electric field inside the microlaser cavity. The field is strongest around the notch in the outside surface, from which a single laser beam can emerge.

Genomics

DNA double agent

Curr. Biol. **13,** 1518–1523 (2003)

Selfish DNA is genetic information that has inserted itself into our genome to serve its own purposes. In some cases this happened many millions of years ago. Back then, selfish DNA was active and could infect new cells. Nowadays, it is largely inactive and has decayed into a fossil-like state.

Clare Lynch and Michael Tristem have now found one of the most ancient selfish genetic elements described to date. Known as a *gypsy* LTR-retrotransposon, it has been hiding in the genomes of mice, rats, sheep and humans for more than 70 million years. The element appears to have lost sequences that would allow it to function as a retrotransposon. Yet, contrary to expectations, it is still active in other respects: it contains long regions of functional, coding DNA.

Lynch and Tristem propose that, over time, the retrotransposon has become domesticated by its hosts, and now serves a useful purpose. This may be the key to its long life. Although its exact function is unknown, the authors speculate that this genetic element may be a molecular double agent, guarding cells against infection by other members of its own family. **Helen R. Pilcher**