

# In brief



## Why the slimiest snails slip to the back of the pack

IF YOU are into betting on snail races, here's a tip: put your money on the least slimy snail. Making mucus requires energy, and it turns out that snails slither best when they produce as little as possible of just the right kind of goo.

Snails, slugs and other gastropods move by using their muscles to generate travelling waves of stress in the thin layers of mucus they lay down. Because it takes more energy to produce the mucus than to power their muscles, they need to get by with the thinnest layer possible.

The key to their success seems to be an unusual physical

property of the mucus. When Eric Lauga and Annette Hosoi of the Massachusetts Institute of Technology modelled the locomotion of gastropods mathematically, they found that the creatures exploit a phenomenon called "shear-thinning" – a fall in the viscosity of the mucus when it is between two surfaces that are moving relative to one another. "Shear-thinning allows the gastropod to crawl while using the least amount of fluid," Lauga says.

The viscosity of most liquids does not change under such conditions, and some become more viscous between moving surfaces. The viscosity of snail and slug mucus, by contrast, drops by a factor of more than 1000 under biologically realistic conditions ([www.arxiv.org/cond-mat/0608363](http://www.arxiv.org/cond-mat/0608363)).

## The nitrogen the Vikings left behind

DISCOVERING ancient settlements is often rather hit and miss, but the odds would be improved with a bit of chemical analysis. Plants growing over old sites of human habitation have a different chemistry from their neighbours, and these differences can reveal the location buried ruins.

Plants mostly take in nitrogen from the soil as the isotope

nitrogen-14, with just a dash of nitrogen-15. Plants growing above archaeological sites in Greenland, however, seem to have absorbed a larger dose of nitrogen-15.

Rob Commisso and Erle Nelson from Simon Fraser University in British Columbia, Canada, spent three summers collecting plants from sites in south-west Greenland. Some of their samples were unusually rich in nitrogen-15,

and subsequent digs revealed that these plants had been growing above long-abandoned Norse farmsteads (*Journal of Archaeological Science*, vol 33, p 1167).

Human habitation and farming can explain the enrichment. "For archaeological sites the nitrogen is derived from refuse or other nitrogenous compounds that people have deposited in the past," says Commisso. This will contain more nitrogen-15 than uncultivated soil.

## Flies feel the heat

FRUIT flies on three continents have independently evolved identical genetic changes within just two decades – and they've almost certainly done it to cope with global warming.

"Global warming is leaving its imprint on genes," says Raymond Huey of the University of Washington in Seattle, a member of the team that made the discovery. "For this to happen in such a short time-frame in so many parts of the world is rather disturbing."

The researchers analysed DNA from *Drosophila subobscura* from 26 sites in Europe, South America and North America. They were looking for particular chromosomal changes that tally with latitude and, by implication, with ambient temperature.

The result? Changes once found only at warmer latitudes have spread as temperatures have risen further away from the equator (*Science*, DOI: 10.1126/science.1131002).

## Double whammy targets malaria

A TWO-for-one vaccine may offer a cheaper, more effective way to protect against malaria.

Biotechnology company GenVec of Gaithersburg, Maryland, modified an adenovirus to express fragments of two proteins called CSP and LSA1, which are normally produced by the malaria parasite *Plasmodium falciparum*. Once injected into people, the virus should churn out both these antigens, priming the immune system to target the parasite.

Tests in mice have shown a vaccine containing the modified virus triggers 5 to 10 per cent of the "killer T" immune cells in mice to recognise and stop the malaria infection, a change in immunity sufficient to protect mice against the parasite.