

RESEARCH HIGHLIGHTS

Selections from the scientific literature

MICROBIOLOGY

Immobile bacteria hitchhike on rafts

Bacteria that are unable to move on their own can hitch a lift on their mobile neighbours.

Yael Helman of the Hebrew University of Jerusalem and her team found that, on agar plates, the bacterium *Xanthomonas perforans* — which does not move on solid surfaces — triggered *Paenibacillus vortex* to move closer to it, and then used this travelling species as transport. This interaction occurred even when the two species were separated by a plastic barrier, suggesting that *X. perforans* releases an airborne substance to signal for a lift. Electron-microscope images revealed single *X. perforans* cells on 'rafts' of *P. vortex*.

This hitchhiking also occurred on leaves, and between other xanthomonads and motile bacteria, suggesting that the behaviour could be widespread.

ISME J. <http://doi.org/q67> (2013)

GEOLOGY

Water dives deep inside Earth

Slabs of Earth's crust that are plunging deep into the planet could be carrying much larger amounts of water into the planet's mantle than previously thought.

In the northwest Pacific Ocean, where the Pacific plate sinks beneath Japan, Tom Garth and Andreas Rietbrock of the University of Liverpool, UK, studied earthquakes originating from within the diving slab. Modelling indicated that the quakes occur along water-rich faults that form as the plate bends before diving below.

Over Earth's lifetime, the



E. LACASA-MARQUINA/L. MARTIN-FRANCÉS

PALAEANTHROPOLOGY

Broken teeth point to rough diet

Teeth from a 1.8-million-year-old human fossil show signs of disease and are extremely worn — possibly from eating hard and fibrous foods.

In 2000, researchers uncovered a jaw bone (pictured) at a site in Dmanisi, Georgia, which has produced the oldest human fossils outside Africa. Laura Martín-Francés at the National Research Centre on Human Evolution in Burgos, Spain, and her team examined the fossil, dubbed

D2600, including its teeth. Most of the teeth had no protective enamel left, and the roots and interior showed signs of infection.

The wear patterns — which are unlike those of other human specimens of a similar age — could have been caused by a diet of abrasive and fibrous plants and fruits, similar to that of apes, the researchers say.

Comptes Rendus Palevol <http://doi.org/q5t> (2014)

Pacific plate could have taken the equivalent of 3.5 oceans into the mantle. Some of that water is released and rises upward, fuelling volcanoes; the rest plunges deeper into the planet.

Geology <http://doi.org/q7p> (2014)

ATMOSPHERIC SCIENCE

Shifting winds freeze China

Not only has climate change been responsible for frequent bouts of record-breaking summer heat in China since 2000, but it could also be the cause of the unprecedented winter cold that has plagued northern parts of the country

in several recent years.

Xueyuan Kuang and her team at Nanjing University in China analysed the distribution of record-breaking high and low temperatures observed between 1951 and 2010 at nearly 1,900 weather stations across China. Records for summer highs were set more frequently between 2000 and 2010 than in the previous two decades. Record winter lows seemed to cluster in northern China in the 2000s, whereas in the 1990s they were spread across most of the country.

This clustering seems to be a result of air-pressure anomalies and shifting jet streams over Eurasia in autumn and winter since the late 1990s. These changes can

cause cold Siberian air to flow into and persist over northern China, the team found.

J. Geophys. Res. <http://doi.org/q5k> (2014)

METABOLISM

Mother's fatty diet hurts offspring

Female mice that eat a high-fat diet while nursing their pups predispose them to obesity and diabetes by altering the pups' brain wiring.

Tamas Horvath at Yale University in New Haven, Connecticut; Jens Brüning at the Max Planck Institute for Neurological Research in Cologne, Germany; and their team discovered that mice that