

ocean's upper 2,000 metres have strongly warmed since 2005. However, at depths below 2,000 metres, the ocean has absorbed negligible amounts of heat during this period.

These two studies have implications for accurately assessing the effects of climate change on sea-level rise.

*Nature Clim. Change* <http://doi.org/v58>; <http://doi.org/v6j> (2014)

## GEOPHYSICS

## Mid-depth quakes are risky too

Earthquakes that originate at intermediate depths are an underappreciated seismic risk, according to a study of a June 2014 earthquake in the western Aleutian Islands off Alaska.

The epicentre of the magnitude-7.9 quake was approximately 100 kilometres deep, making the quake the largest in this depth range — between about 70 and 200 km down — in the past century. Thorne Lay of the University of California, Santa Cruz, and his colleagues analysed the earthquake and found that the energy release was weak at first but became strong during its final 25 seconds.

Other regions with a similar tectonic structure, such as Japan and Indonesia, should be aware of how big and powerful intermediate-depth quakes can be, the authors warn.

*Geophys. Res. Lett.* <http://doi.org/v45> (2014)

## NEUROSCIENCE

## How curiosity enhances learning

Curiosity boosts people's ability to learn and retain new information, thanks to key reward and memory centres in the brain.

Matthias Gruber and his colleagues at the University of California, Davis asked volunteers to rate their level of curiosity for a series of trivia questions, and then scanned

their brains as they saw the questions and waited for the answers.

For questions that they were curious about, participants remembered answers better than for questions in which they were less interested. Brain scans showed increased activity during this learning in regions that respond to reward and regulate memory formation, and revealed heightened connectivity between the two regions.

The volunteers were shown unrelated faces while they waited for the trivia answers, and were better at learning those faces when their curiosity was aroused. This suggests that curiosity also helps with the learning of incidental information.

*Neuron* <http://doi.org/v6m> (2014)

## CLIMATE SCIENCE

## Plant growth leads to Arctic warming

Increased carbon dioxide in the atmosphere is known to boost vegetation cover at high latitudes — and this could accelerate Arctic warming year-round.

Grasses and shrubs have a warming effect because plant-covered areas reflect less sunlight than barren surfaces do. Baek-Min Kim at the Korea Polar Research Institute in Incheon, South Korea, Sang-Yoon Jun at the Korea Institute of Atmospheric Prediction Systems in Seoul and their colleagues used a climate model to study the impact of doubled CO<sub>2</sub> concentrations and increased high-latitude plant growth on Arctic temperatures.

They found that increased vegetation in summer warms the surface and this heat moves to the Arctic, where it causes additional ocean warming and sea-ice melting in winter and spring. The exposed ocean then releases more heat, leading to a further boost in Arctic warming and

## SOCIAL SELECTION

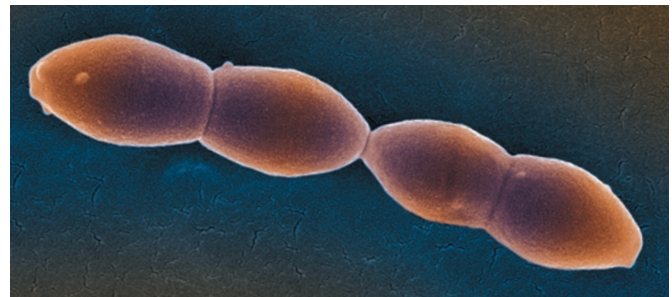
Popular articles  
on social media

## 'Riff-raff' charge draws ire

When Steven McKnight, president of the American Society for Biochemistry and Molecular Biology (ASBMB), publicly complained in the society's September newsletter about the "riff-raff" that has infiltrated the research world (see [go.nature.com/tu4nun](http://go.nature.com/tu4nun)), he quickly found himself in the social-media spotlight. He argued that the grant-review system run by the US National Institutes of Health is failing partly because of mediocre researchers serving on review committees. "The average scientist today is not of the quality of our predecessors," wrote McKnight, who chairs the biochemistry department at the University of Texas Southwestern Medical Center in Dallas.

Many researchers found his article insulting. Michael Hendricks, a neuroscientist at McGill University in Montreal, Canada, tweeted: "If I had any idea what the @ASBMB was, I would be cancelling my membership today." In an interview, McKnight said that he regrets his choice of words, but stands by his arguments.

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promoting even more plant growth the following season, the team says.

*Environ. Res. Lett.* 9, 094007 (2014)

## MICROBIAL GENETICS

## Gene switch helps bacteria invade

A bacterium that causes pneumonia and other ailments can switch between six different forms by rearranging key genes, allowing the microbe to alter its ability to infect.

*Streptococcus pneumoniae* (pictured) lives harmlessly in the nose but can cause serious infections in some people. Michael Jennings at Griffith University in Southport, Australia, Marco Oggioni at the University of Leicester,

UK, and their co-workers focused on a specific set of genes comprising a system called SpnD39III in a strain of *S. pneumoniae*. They found that rearrangements of these genes result in six distinct bacterial subpopulations, each with its own pattern of methyl groups on DNA, which modify gene expression.

The subpopulations caused infections of varying severity in mice.

The finding suggests how this pathogen can quickly adapt to changing environments, such as when it shifts from harmless colonization to invasive disease.

*Nature Commun.* 5, 5055 (2014)

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