RESEARCH HIGHLIGHTS

Selections from the scientific literature

AGROECOLOGY

Bees are better for strawberries

Bee pollination doesn't just boost yields of fruit crops — it also improves fruit quality, at least in strawberries.

Strawberry plants can self-pollinate, or be pollinated by wind or bees. Björn Klatt of the University of Göttingen in Germany and his colleagues grew the fruit using a permeable plastic to eliminate wind and bee pollination, or fine-mesh bags to exclude just bees. They found that berries grown uncovered but pollinated by bees were heavier, redder, and had a longer shelf life and a more desirable sugar-to-acid ratio than wind- or self-pollinated berries.

The researchers say that bee pollination boosts hormonal growth regulators that improve the quality of the berries.

Proc. R. Soc. B **http://doi.org/qcg (2013)**

CLIMATE CHANGE

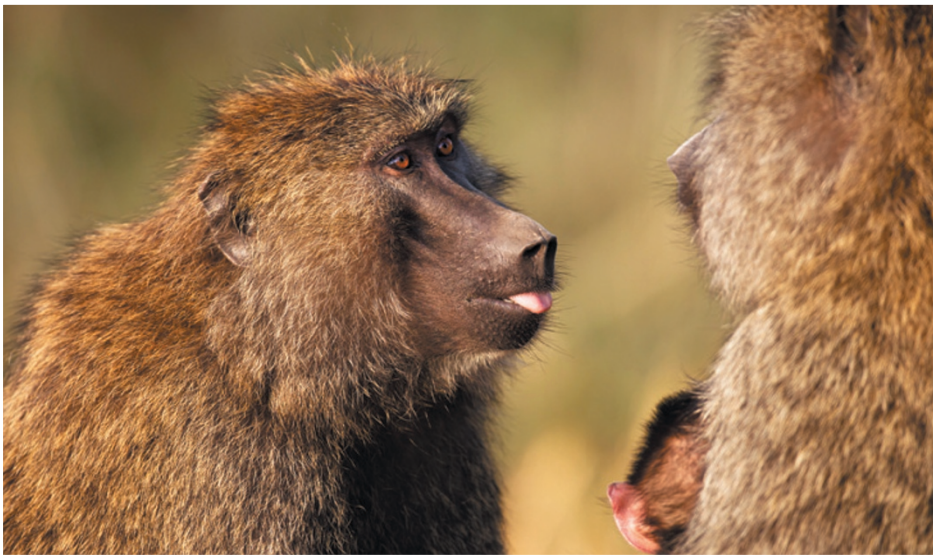
Melting ice spurs wild weather

Recent weather extremes during summer in the Northern Hemisphere, such as the 2012 drought in the United States (**pictured**), seem to be linked to loss of Arctic sea ice and reductions in snow cover.

Qiuhong Tang of the Institute of Geographic Sciences and Natural Resources Research in Beijing and his colleagues compared meteorological records with satellite observations of snow and ice. They found that Arctic sea-ice retreat and, to a lesser degree, decreased snow cover alter large-scale atmospheric circulation patterns — for example, by shifting the jet stream northwards. These changes typically cause heatwaves and other extreme weather events at mid-latitudes.

The results could help to improve seasonal and longer-term climate forecasts, the team says.

Nature Clim. Change **http://doi.org/qds (2013)**



ANUP SHAH/CORBIS

ANIMAL BEHAVIOUR

Baboons know when to be noisy

Baboons can tell whether they need to make a ruckus to get attention or if they already have a captive audience.

To see whether the animals adjust their mode of communication according to the level of an observer's attention, Marie Bourjade at Aix-Marseille University, France, and her colleagues tempted 16 captive olive baboons (*Papio anubis*; **pictured**) with a tasty fruit treat. The experimenters stood facing the animals with their eyes either open or closed, or turned away from the animals.

Baboons made more begging hand gestures when experimenters had their eyes open. When the experimenters' eyes were closed or their backs were turned, the monkeys tended to make noisy banging actions instead. Attention-getting gestures in monkeys may have been a starting point for the evolution of intentional vocal communication in great apes and humans, the researchers suggest.

Anim. Behav. **http://doi.org/qcb (2013)**

ASTROPHYSICS

Trio of distant quasars found

Astronomers have discovered three distant quasars that will allow them to probe the conditions of the early Universe.

A team led by Bram Venemans at the Max Planck Institute for Astronomy in Heidelberg, Germany, discovered the active galactic nuclei using the European Southern Observatory's Visible and Infrared Survey Telescope for Astronomy Kilo-degree Infrared Galaxy (VIKING) survey. The findings bring the number of known quasars that are beyond the detection limit of visible-light cameras to four.

The authors say that studying the quasars, which are thought to be powered by supermassive black holes more than 1 billion times the mass of the Sun, will shed light on how massive galaxies and black holes formed

VICTOR J. BLUE/BLOOMBERG VIA GETTY

less than 900 million years after the Big Bang.
Astrophys. J. 779, **24 (2013)**

BIOTECHNOLOGY

CRISPR corrects genetic disease

A system for editing genes has now been used to repair disease-related mutations in mice and human stem cells, highlighting the technology's therapeutic potential.

The recently developed CRISPR system uses an RNA strand matching a target gene to guide a bacterial enzyme, Cas9, to excise the gene. Jinsong Li and his colleagues at the Shanghai Institutes for Biological Sciences in China used the technique in fertilized mouse eggs to correct the mutated *Crygc* gene, which causes cataracts. The mice grew into healthy adults that bore normal offspring.

In a separate paper, Hans Clevers at the Hubrecht Institute in Utrecht, the Netherlands, and his team repaired the cystic fibrosis gene, *CFTR*, in cultured intestinal stem cells obtained from patients with the disease.
Cell Stem Cell 13, **653–658; 659–662 (2013)**

METEOROLOGY

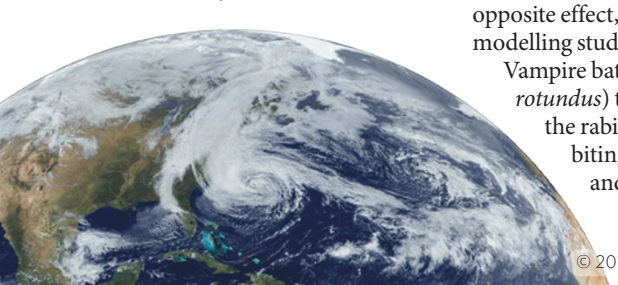
Satellite improves storm forecasts

Data from a US Earth-observing satellite could help improve the accuracy of predictions of hurricane track and strength.

When generating hurricane forecasts, the US National Weather Service does not use real-time information from weather satellites. But Xiaolei Zou at Florida State University in Tallahassee and her colleagues looked at the effect of including data from the Suomi NPP satellite, launched in 2011, on hurricane forecasts. The satellite's microwave instrument measures air temperature and humidity.

Incorporating Suomi data into the government's hurricane model for four 2012 storms, including Sandy (**pictured**), made for more accurate forecasts of track and intensity. The work suggests a way to improve the notoriously difficult predictions of storm strength.
J. Geophys. Res. Atm. 118, **11558–11576 (2013)**

ROBERT SIMMON/NASA/NOAA GOES



NEUROSCIENCE

Primate brain makes oestrogen

Ovaries are the main producers of oestrogen but when they give out, the brain in monkeys can take over in making the hormone.

Ei Terasawa and her colleagues at the University of Wisconsin in Madison removed the ovaries of female rhesus monkeys (*Macaca mulatta*) and briefly stimulated the animals' brains with oestrogen or an electrical current. The brain's hypothalamus region began producing its own oestrogen, along with other hormones involved in reproduction.

If human brains have the same capability, targeting this oestrogen source could be a way to treat diseases such as depression that may be linked to oestrogen imbalances, the authors say.
J. Neurosci. 33, **19051–19059 (2013)**

ECOLOGY

Why rabies hangs on after bat culls

Culling vampire bats in South America to combat the spread of rabies could be having the opposite effect, according to a modelling study.

Vampire bats (*Desmodus rotundus*) transmit the rabies virus by biting humans and livestock. Julie Blackwood at Williams College in Williamstown, Massachusetts, and her colleagues analysed field data on individual bats collected from 17 colonies in Peru between 2007 and 2010. They found that the rabies virus probably does not persist in a single bat colony, but instead is spread between colonies by wandering bats. Most infections do not kill bats but confer temporary immunity, which also maintains the levels of virus.

Bat culls, the researchers note, may increase movement of bats and thus promote the spread of the disease.
Proc. Natl Acad. Sci. USA **http://doi.org/qb9 (2013)**

PALAEONTOLOGY

Ancient reptiles stuck to the air

Flying reptiles that went extinct around 65 million years ago probably did not spend much time on water — even though fossils of the creatures with fish in their stomachs have been found in ancient oceans and lakes.

David Hone, at Queen Mary University in London, and Donald Henderson at the Royal Tyrrell Museum of Palaeontology in Drumheller, Alberta, tested the floating-pterosaur hypothesis by creating computer models of what four pterosaurs might have looked like afloat. They took account of the reptiles' bone density, skeleton shape and other factors. The models suggest that, under most conditions, pterosaurs would have oriented their heads horizontally to the water, leaving the bottom one-quarter to one-third of their heads submerged.

Pterosaurs would have risked drowning if they spent too much time on the water, the researchers say.
Palaeogeogr. Palaeoclimatol. Palaeoecol. **http://doi.org/qcf (2013)**

COMMUNITY CHOICE

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ENVIRONMENTAL SCIENCE

Gas production contaminates water

HIGHLY READ on pubs.acs.org in November

Waste water from oil and gas production is contaminating surface waters and sediments in western Pennsylvania — even after it has been treated.

In the United States, such waste is sometimes sent to treatment facilities and then discharged into streams and rivers. Nathaniel Warner, Avner Vengosh and their colleagues at Duke University in Durham, North Carolina, analysed the effluent in 2010–12 at a facility that treated water from gas wells in the Marcellus Shale. They looked at samples taken upstream and downstream of the facility, and found increased contaminants such as chloride and bromide downstream.

Although treatment lowered the levels of barium and radium in the waste water, radioactivity levels from radium in river sediments near the facility were 200 times greater than background levels, and were above regulatory limits.

The authors say that the elevated radium levels suggest a risk of radioactivity accumulating in wastewater disposal areas, and that better treatment technologies are needed to reduce contamination.
Environ. Sci. Technol. 47, **11849–11857 (2013)**

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