

CERN's Large Hadron Collider near Geneva, Switzerland, have come up with the most convincing evidence yet for this exotic particle.

In one study, the authors reanalysed previous particle-decay data while reducing their model's assumptions. They showed at extremely high statistical significance that pentaquarks are needed to explain the data. In the second study, the researchers examined data from a particular kind of decay, finding that they are in line with predictions of decays involving pentaquarks.

Phys. Rev. Lett. <http://doi.org/bpsb>; <http://doi.org/bpsb> (2016)

ANIMAL BEHAVIOUR

Cuttlefish can count

Cuttlefish seem to be able to distinguish between large and small numbers, at least when it comes to food.

Tsang-I Yang and Chuan-Chin Chiao at National Tsing Hua University in Hsinchu, Taiwan, let pharaoh cuttlefish (*Sepia pharaonis*; pictured) in the lab choose between two chambers containing different numbers of shrimps to eat. The animals consistently selected the chamber with more shrimps, regardless of whether there was a large or small difference in prey numbers. The cuttlefish also opted for two shrimps that were smaller and easier to eat than one large shrimp. But if they were hungry, they took the bigger and trickier meal.

This shows that cuttlefish have a number sense, and

that their choice of prey is motivated by both hunger and the size of the potential reward, the authors say.

Proc. R. Soc. B 283, 20161379 (2016)

GEOCHEMISTRY

Rare mineral found on Earth

Volcanic rocks from Israel contain the first known occurrence on Earth of a titanium-rich mineral called tistarite. The discovery suggests that deep-Earth chemistry may differ from what scientists had suspected.

Until now, tistarite had been found only in a single meteorite from Mexico. A team led by William Griffin at Macquarie University in Sydney, Australia, found more of it in rocks from Mount Carmel.

Tistarite forms in chemically reducing conditions, for instance in high-hydrogen environments. The authors suggest that hydrogen or methane might percolate deep into volcanic plumbing systems, creating ultra-reducing pockets in which the unusual mineral can form.

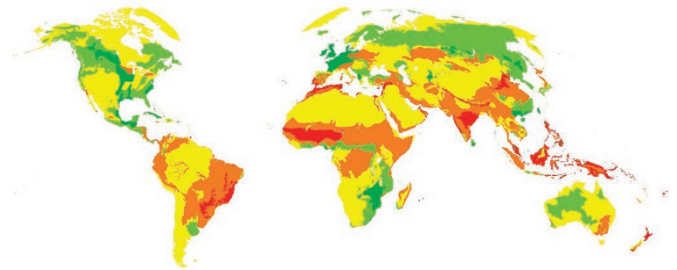
Geology <http://dx.doi.org/10.1130/G37910.1> (2016)

INFECTION

Effects of sexually spread Zika

Vaginal infection of pregnant mice by the Zika virus can cause growth restriction, brain infection and death of the fetus.

Some people have been infected by the Zika virus



Human footprint change

■ Improved ■ Slightly improved ■ Slightly degraded ■ Degraded ■ Highly degraded

through sexual activity rather than from mosquito bites. To study the effects of the virus after sexual transmission, a team led by Akiko Iwasaki at the Yale University School of Medicine in New Haven, Connecticut, developed a mouse model for vaginal transmission of the virus. They found that this mode of infection caused pathology in the fetuses in immunologically normal mothers; previous studies had suggested that Zika could not sustain long-lived infections in such animals when injected into the skin.

The results implicate the female genital tract as a particularly vulnerable site for Zika infection.

Cell <http://dx.doi.org/10.1016/j.cell.2016.08.004> (2016)

CONSERVATION

Uneven growth of human footprint

The human footprint on the global environment increased by just 9% from 1993 to 2009, even though the world's population grew by 23% and the economy by 153% during that period. However, this varied by region.

A previous study had looked at humanity's impacts on the terrestrial globe, using satellite and survey data from 1993 to quantify built environments, agricultural land, population density and other variables. To update the work, Oscar Venter at the University of Northern British Columbia in Prince George, Canada, and his colleagues compared those numbers with 2009 data.

They found that areas with the highest levels of

biodiversity, including many tropical areas, showed the fastest growth of the human footprint (pictured, in red and orange). Wealthy nations and those with strong control of corruption and high rates of urbanization showed the least growth in impacts (green). *Nature Commun.* 7, 12558 (2016); *Sci. Data* 3, 160067 (2016)

NEUROSCIENCE

Protein controls brain's thermostat

A heat-sensitive protein in the brain helps to detect and regulate body temperature in mice.

Previous research had suggested that the ion channel TRPM2, which allows ions to pass across cell membranes, is involved in sensing warm temperatures. Now Jan Siemens at the University of Heidelberg in Germany and his colleagues report that the channel is expressed in a part of the hypothalamus, a brain region that helps to control body temperature. When injected with a molecule that triggers fever, mice lacking TRPM2 had higher body temperatures than control animals. The team also found that activating TRPM2-expressing neurons decreased body temperature, whereas inhibiting those neurons increased it.

The authors suggest that TRPM2 helps the brain to limit the severity of a fever. *Science* <http://doi.org/bpzg> (2016)

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