CHEMISTRY

When alkanes turn tail

Alkanes are molecules that contain only carbon and hydrogen atoms, connected by single bonds. Short-chain alkanes such as butane and octane — which contain linear chains of four and eight carbon atoms, respectively — stretch out in extended zig-zags. However, longer hydrocarbon chains tend to fold themselves into hairpin structures.

Ricardo Mata, Martin Suhm and their colleagues at the University of Göttingen, Germany, determined the point at which this transition becomes energetically favourable. The researchers performed spectroscopy on supersonic jets of alkane molecules at temperatures of 100–150 kelvin — and found that the folded structure becomes more stable than the extended conformation when an alkane chain is around 18–19 carbon atoms long.

The result broadly agrees with the authors' quantum calculations, and can be used to train computer models of molecular mechanics.

Angew. Chem. Int. Edn **http://dx.doi.org/10.1002/anie.201202894 (2012)**

R. HODDINOTT/NATUREPL.COM

MATERIALS

Why barnacles stick around

Barnacles are among the clingiest of creatures, but how they manage to stick so tenaciously to surfaces is unclear.

When Jaimie-Leigh Jonker of the National University of Ireland, Galway, and her colleagues examined the barnacle *Lepas anatifera*, they found that its adhesion system is radically different from that of other clingy sea creatures, such as mussels and tubeworms. Large, single-cell glands in *L. anatifera* secrete a clumpy substance filled with sticky proteins, although exactly how the glue works remains mysterious.

Researchers hope that future studies of barnacle glue will yield better adhesives, particularly for medical applications.

J. Morphol. **http://dx.doi.org/10.1002/jmor.20067 (2012)**

PALAEONTOLOGY

Excavation of a digger

Examination of a 57-million-year-old nearly complete fossil skeleton (**selected bones pictured**) has advanced a long debate over the place of the mammal *Ernanodon antelios* in evolutionary history.

The fossil of the ancient mammal was discovered in rocks in Mongolia. Peter Kondrashov and Alexandre Agadjanian from the Borissiak Paleontological Institute of the Russian Academy of Sciences in Moscow describe *E. antelios* as having strong forelimbs and large claws, which it used to scratch and dig for food. Examination of the bones led the authors to suggest that the mammal is more closely related to pangolins than it is to armadillos and anteaters.

J. Vertebr. Paleontol. 32, **983–1001 (2012)**

P. KONDRASHOV

OCEAN BIOCHEMISTRY

The mystery of high seas methane

Marine microbes offer a plausible explanation for the surprising abundance of methane in oxygenated parts of the ocean.

Scientists have previously theorized that ocean methane might be a by-product of microorganisms' use of methylphosphonic acid as a source of phosphorus. But it was unclear where the acid itself came from. William Metcalf and Wilfred van der Donk at the University of Illinois in Urbana and their colleagues show that a microbe called *Nitrosopumilus maritimus* carries genes that encode a pathway for methylphosphonate synthesis.

A crucial gene in this pathway is also found in many other marine microbes, suggesting that these organisms may be the source of the unexplained ocean methane.

Science 337, **1104–1107 (2012)**

EVOLUTIONARY ANTHROPOLOGY

Small families in rich societies

The tendency of families in wealthier societies to produce fewer children is hard to explain in evolutionary terms. A study of Swedish families

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