

RESEARCH HIGHLIGHTS

Selections from the scientific literature

CLIMATE SCIENCES

Economic link to global warming

Changes in the rate of global warming can be pinned to specific episodes in human history.

In a statistical analysis, a team led by Francisco Estrada of the National Autonomous University of Mexico in Mexico City looked at global mean temperatures since 1880, as well as greenhouse-gas levels and other factors that warm or cool the planet. The authors found that economic slowdowns during the two world wars and in the Great Depression temporarily slowed the planet's warming.

The analysis also suggests that the Montreal Protocol, which phased out chemicals that deplete the ozone layer and trap heat, has helped to slow warming in recent decades.

Nature Geosci. <http://doi.org/p2b> (2013)

For a longer story on this research, see go.nature.com/g93gb6

ARCHAEOLOGY

Burials indicate Viking sacrifices

Vikings may have sacrificed slaves to be buried with their masters.

In the 1980s, archaeologists working on the Norwegian island of Flakstad discovered and excavated ten individuals from six burials dating to between AD 550 and AD 1030. Remains from three multiple burials all contained at least



one skeleton lacking its skull.

To establish the relationship between them, a team led by Elise Naumann of the University of Oslo analysed mitochondrial DNA (which is inherited from the mother) as well as nitrogen and carbon isotopes from various parts of the skeletons (including a tooth; **pictured**).

The results suggested that individuals in the multiple burials did not share maternal ancestry, and that individuals found without skulls generally ate less meat than intact individuals in the same graves. The differences in ancestry and diet imply that the beheaded individuals might have been slaves, as has been suggested for other double burials from the Norse world. *J. Archaeol. Sci.* 41, 533–540 (2013)



PHYSICS

Traffic jams follow the laws of physics

Traffic congestion closely resembles the physics of phase transitions, such as when ice melts or a metal becomes superconducting.

Shin-ichi Tadaki at Saga University in Japan and his colleagues used a high-resolution laser scanner to track cars travelling around an empty indoor baseball stadium, then analysed those

data as if they were studying phase transitions in a material. They found that above a critical density of cars, traffic flow became unstable and changed from free-flowing to a jam.

Scaled up, that density value fits with those seen on real-world motorways, the authors say. *New J. Phys.* 15, 103034 (2013)

CANCER

Breast-cancer mutations found

Mutations in the gene encoding the oestrogen receptor (ER) have been identified in aggressive breast tumours.

About 70% of breast cancers express the ER, which helps to propel rampant growth. Several drugs target the effects of the sex hormone on its receptor, but tumours often develop resistance to such treatment.

Independent teams led by Sarat Chandralapaty at the Memorial Sloan-Kettering Cancer Center in New York, Arul Chinnaiyan at the University of Michigan in Ann Arbor and Ido Wolf at the Tel Aviv Sourasky Medical Center

in Israel, sequenced tumours from a total of 104 patients with metastatic breast cancer and found ER mutations in 25. Further work indicated that these mutations could keep the receptor active even in the absence of oestrogen.

Drugs that inhibit the receptor in other ways might stall aggressive tumours, the researchers say. *Nature Genet.* <http://doi.org/pxp>; <http://doi.org/pxq> (2013) *Cancer Res.* <http://dx.doi.org/10.1158/0008-5472.can-13-1197> (2013)

CRYPTOGRAPHY

Keeping quantum secrets

Quantum cryptographers have used devices in Switzerland and Singapore to deliver a

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