

RESEARCH HIGHLIGHTS

Selections from the
scientific literature

GEOLOGY

Clues to extinction in lava gases

Acid rain and ozone depletion probably contributed to the greatest extinction Earth has ever seen.

Massive volcanic eruptions occurred in Siberia at around the same time as the extinction event that ended the Permian era some 252 million years ago, but it is not clear how the two are linked. Benjamin Black of the Massachusetts Institute of Technology in Cambridge and his colleagues analysed the amounts of gases trapped in the Siberian lava. They put the data into a global climate model describing the ancient atmosphere.

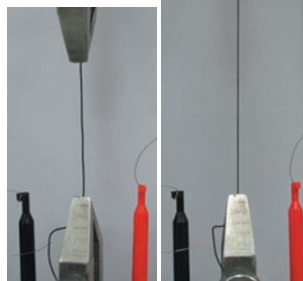
The levels of some gases emitted by the magma, such as carbon dioxide and sulphur dioxide, would have turned rainfall to acid. Others, such as methyl chloride, may have chewed away at the planet's protective ozone layer.

Geology <http://doi.org/p7s> (2013)

ELECTRONICS

Power storage in stretchy fibres

Wearable electronics require stretchy components, but such parts are often flat sheets, which limits their ability to be incorporated into fabrics. So Huisheng Peng and his colleagues at Fudan University in Shanghai, China, have developed supercapacitors



— devices that store electric charge — in the form of highly stretchable fibres, which can be woven into textiles.

The researchers made the supercapacitors by coating rubber fibres with alternating layers of an electrolyte and sheets of carbon nanotubes that act as electrodes. Even when the fibres are stretched more than 100 times to 175% (pictured) of their original length, they still provide a power output that is equivalent to other carbon-based, fibre-shaped supercapacitors that are not stretchy.

Angew. Chem. Int. Edn <http://doi.org/f2nqcn> (2013)

CANCER

How cholesterol drives tumours

A cholesterol breakdown product speeds up the rate at which tumours grow and spread in mouse models of breast cancer.

High cholesterol is a known risk factor for breast cancer, so Donald McDonnell at Duke University in Durham, North Carolina, and his colleagues increased blood levels of a cholesterol metabolite, 27HC, in mice with breast tumours.

Tumours in treated mice

grew faster and spread to the lungs more often than in untreated animals. In human cancer cells, higher expression of an enzyme that converts cholesterol to 27HC correlated with more-aggressive tumours. In one mouse model, a high-fat diet boosted 27HC levels in the blood and increased tumour growth, but this slowed down when the animals were given a cholesterol-lowering statin.

The breakdown product drives tumour growth by binding to the receptor for oestrogen.
Science 342, 1094–1098 (2013)



ECOLOGY

Sharks never forget home

Female lemon sharks return to their birth waters to deliver offspring — the first direct observation of such behaviour in any shark species.

Kevin Feldheim at the Field Museum in Chicago, Illinois, and his colleagues collected and analysed DNA from lemon sharks (*Negaprion brevirostris*; pictured) in the waters surrounding the Bimini Islands in the Bahamas every year from 1995 to 2012. At least six

female sharks born there between 1993 and 1998 later returned to give birth. The females were also faithful to particular nursery areas between the islands.

Conservation efforts should limit fishing in such areas when females return to give birth, or should look to establish marine reserves that encompass the nurseries, the researchers suggest.
Mol. Ecol. <http://doi.org/p78> (2013)