molecules, which are essential for protein synthesis. A quarter of a century ago, this catalyst's RNA component was shown to be crucial to its function in bacterial cells; since then, researchers have shown that this RNA can do the job without any help from proteins in the two other evolutionary branches of life, archaea and eukaryotes.

But Walter Rossmanith of the Medical University of Vienna and his colleagues have identified and purified the components of human mitochondrial RNase P, finding only proteins, and reconstituted its catalytic activity using just three of these.

ASTRONOMY

Hidden gems

Astrophys. J. doi:10.1086/592037 (2008)

If the remnants of the first stars were to be found, they should be in small galaxy groups — relatively common structures. Calculations by Michele Trenti, now of the University of Colorado at Boulder, and his colleagues also suggest that the earliest, brightest quasars evolved to become part of galactic groups of medium brightness.

This is at odds with current theory, which puts remnants of the first stars — born when the Universe was just 65 million years old — in the largest observable clusters in the present-day Universe. Similarly, current theory places the remnants of the brightest quasars from about 1 billion years after the Big Bang in the largest clusters.

NEUROSCIENCE

Making memories

Cell **135,** 535–548 (2008)

A protein called MyoVb may aid learning and memory by helping to strengthen connections between neurons.

Memories are thought to form through a process of 'long-term potentiation', which improves communication between neurons that fire simultaneously. This requires the transport of molecules to small spines sticking out of neurons. The spines receive electrical signals from other neurons.

Michael Ehlers of Duke University Medical Center in Durham, North Carolina, and his colleagues have discovered that MyoVb moves the vesicles that transport molecules down spines during long-term potentiation. Eliminating MyoVb levels blocked spine growth. It also stopped a type of receptor that is important for rapid communication between neurons being inserted into the spines' membranes. Chemically blocking MyoVb halted long-term potentiation in mouse brain slices.

GEOSCIENCES

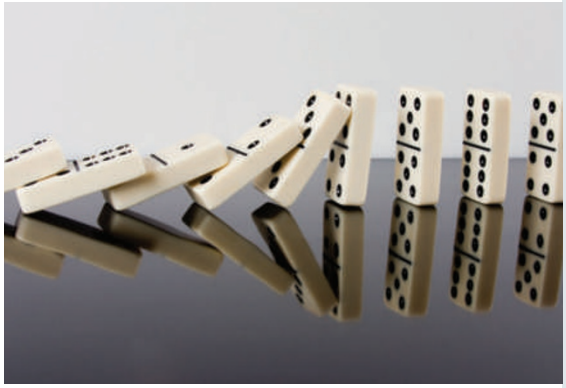
Join the club

Nature Geosci. doi:10.1038/ngeo338 (2008)

Antarctica can finally be included in the list of places warmed by human activity. Nathan Gillett of the University of East Anglia, UK, and his colleagues have shown a clear human influence on temperatures at both the North and South Poles with data going back to 1900 and 1950, respectively.

They compared the available data from both poles to simulations from four climate models. The records from both poles could not be explained by natural variation or natural driving forces alone.

So far, the Intergovernmental Panel on Climate Change has said there are insufficient data to point the finger at an anthropogenic impact in Antarctica. Gillett thinks that conclusion is due for an update.



E. ROBISON/ALAMY

THEORETICAL PHYSICS

Toppling tubes

Phys. Rev. Lett. **101,** 175501 (2008)

Nanotubes made of a honeycomb arrangement of carbon atoms are famed for their strength, but Tienchong Chang of Shanghai University in China has found a chink in their armour. His calculations show that pinching a single-walled carbon nanotube at its end will cause it to collapse along its entire length. The effect is rather like toppling dominos, but in this case the electric charge along the tube, rather than gravity, drives the self-propagating collapse.

This weakness may prove to be a strength. Chang proposes new applications for nanotubes that collapse in this way, including a 'nanogun' for injecting or expelling molecules from devices.

Correction

The Research Highlight 'Twitchy details' (*Nature* **455,** 1152–1153; 2008) stated that Lin Mei is at the Johns Hopkins University School of Medicine in Baltimore, Maryland. He is in fact at the Medical College of Georgia in Augusta.

JOURNAL CLUB

Shanan Peters
University of Wisconsin–Madison

A geologist questions a grand theory.

Atmospheric oxygen concentrations are falling. Breathing is difficult. Those that can't cope are collapsing and dying with symptoms akin to altitude sickness.

This may read like the first page of a Hollywood script, but, according to the oxygen-stress hypothesis, a similar scene occurred 251 million years ago at the end-Permian mass extinction, when up to 95% of all animal species died out. Like all good prevailing hypotheses, this one makes predictions that can be tested, if only the right rocks can be found.

Enter Tyler Beatty of the University of Calgary in Alberta, Canada, and his colleagues. They recently set up camp in the remote reaches of northwestern Canada, where rocks spanning the end-Permian extinction show a shift from Permian sandy carbonates to Triassic sand and mud. They found that fossils of entire creatures are not common at the boundary, preventing taxonomic analyses, but that fossils documenting sediment disturbance by animals are (T. W. Beatty *et al. Geology* **36,** 771–774; 2008). This is fortuitous because such disturbance in marine sediments is linked to oxygen concentration. So these rocks may preserve a 'smoking gun' for an oxygen-stressed world.

However, the shallow marine sediments of the Early Triassic were pervasively burrowed by diverse organisms of the period, including large, oxygen-demanding arthropods. Only deeper-water sediments, deposited below wave-mixed surface waters, had the expected oxygen-stressed fossil traces.

This complicates the oxygen-stress story for the end-Permian mass extinction. Beatty *et al.* stop short of asking whether the end-Permian mass extinction was really caused by a massive reduction in atmospheric oxygen. But in light of their results, I am not holding my breath.

Discuss this paper at **http://blogs.nature.com/nature/journalclub**