brightly coloured. Why has been a mystery.

Ismael Galván of the National Museum of Natural Sciences in Madrid and his colleagues painted the yellow feathers of great-tit (*Parus major*) chicks with a marker pen that reduces the ultraviolet reflectance of a surface. They measured the difference in the chicks' tarsus length — a method used to judge growth rate — over a three day period and compared the results with a control group. The chicks with normally reflective feathers had grown more.

The authors propose that maintaining this ultraviolet reflectance might be a sign of how fit a chick is, and thus determine which the parents feed most.

NANOTECHNOLOGY

Golden advance

Adv. Mater. doi:10.1002/adma.200703026 (2008)

Engineers at the University of Arizona in Tucson have developed a way to make metal nanoparticles that human kidneys should be able to eliminate. This would render the nanoparticles suitable for biomedical imaging with technologies such as optical coherence tomography.

Marek Romanowski and his co-workers used liposomes as templates to prepare hollow, gold spheres 63 nanometres in diameter that can scatter light of preselected wavelengths. The resultant balls of gold and lipid have different optical resonances from that of pure gold structures of the same size — and within the range of visible light.

The nanoshells break up to form 5.7-nanometre-dots when their lipid cores are degraded, which should happen inside the body. This would make the gold nanoparticles small enough to be cleared by renal filtration.

PHOTONICS

Cancer zapper

Nature Photon. doi:10.1038/nphoton.208.100 (2008)

A international team has found a way to minimize collateral damage from photodynamic drugs. Doctors administer the photodynamic drugs before exposing tumours or other diseased tissues to laser light, causing diseased cells to perish.

Harry Anderson at the University of Oxford, UK, Brian Wilson at the University of Toronto in Canada and their colleagues tested a new class of compounds that become toxic only when struck by two photons arriving almost simultaneously. This means that very few cells outside the most intense part of the laser's focus are affected. One of the new compounds proved effective at closing-off blood vessels by killing the cells lining them.

GEOPHYSICS

Mysterious mountains

Geology **36,** 495–498 (2008)

Why do mountains arise in the interior of continents, far from the edges of tectonic plates where deformation — and thus mountain building — is expected?

To answer this question, Scott Dyksterhuis and Dietmar Müller of the University of Sydney in Australia modelled the stress regimes that have helped push up the Flinders Ranges and other nearby mountain belts in the middle of the Australian plate.

They concluded that the plate interior can be affected by forces at the plate edges thousands of kilometres away — a finding that could help explain deformation in the middle of other tectonic plates.

D. WALL/ALAMY

PSYCHOLOGY

Not fair!

Science doi:10.1126/science.1155577 (2008)

If someone treats you badly and you retaliate, blame serotonin. Lower levels of this neurotransmitter make people more likely to retaliate when they perceive others to have breached the maxim 'treat others as you wish to be treated', find Molly Crockett at the University of Cambridge, UK, and her co-workers.

The team temporarily lowered serotonin levels in 20 volunteers and had them play the part of responder in the 'ultimatum game'. The responder can either accept the division of a sum of money offered by the game's proposer, in which case they both get their share, or reject it and deprive both players of the amounts proposed.

Although mood remained unchanged when players' serotonin levels were lowered, they were more likely to reject unfair and very unfair offers, defined as 30% and 20% of the stake, respectively.

JOURNAL CLUB

David Beerling
University of Sheffield

A palaeobiologist calls for greater biological realism in climate models.

The world's most sophisticated climate models fail to adequately replicate climate at high latitudes and over continents' interiors during ancient periods of greenhouse-gas-induced warming: the wintertime predictions are consistently too cold. This makes me worry that the field is missing fundamental feedback processes that amplify warming. If so, climate models might be underestimating how much anthropogenic warming will happen in the future.

What might these mysterious processes be? Lee Kump and David Pollard of Pennsylvania State University in University Park think they have found one. They propose that marine phytoplankton that emit dimethylsulphide — already recognized as a major source of cloud-seeding particles far out to sea — became thermally stressed during the Cretaceous period (100 million years ago). As a result, the phytoplankton grew more slowly and reduced their emissions. Fewer biologically derived aerosol particles meant fewer nuclei for cloud condensation, which, in turn, led to less extensive cloud cover and more transparent clouds. Solar radiation was thus reflected less, and polar temperatures rose by 10–15 °C (L. R. Kump and D. Pollard, *Science* **320,** 195; 2008).

Kump and Pollard's work is exciting for its dramatic result. Nevertheless, the duo's findings are ultimately unsatisfactory; the effects of heat on biological aerosol emissions need to be better described in their model for it to generate really solid conclusions. Although some recent field and laboratory experiments do suggest that marine algae produce less dimethylsulphide when carbon dioxide concentrations approach those of the Cretaceous, much more research is needed. If such results agree with Kump and Pollard's assumptions, I might worry less about climate models — but maybe even more about global warming.

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