

RESEARCH HIGHLIGHTS

Breakin' the law

Science doi:10.1126/science.1161405 (2008)

The controversial 'broken windows' thesis holds that small signs of crime, such as smashed glass and graffiti, can lead to more of the same, or worse. This is the idea behind 'zero tolerance' policing. But strong, supportive evidence for the theory has been lacking.

Kees Keizer and his colleagues at the University of Groningen in the Netherlands covertly observed fellow Groningers who were given the opportunity to steal an envelope that obviously contained a €5 note from a postbox. When the postbox was clean and tidy 13% took the bait; by contrast, 27% stole from a graffitied postbox and 25% from one with litter around it.

Other tests showed that people are more likely to litter in the presence of graffiti or abandoned shopping trollies, and after hearing the crackle of illegal fireworks.



I. WALDIE/GETTY

SPACE SCIENCE

Colour test

Icarus doi:10.1016/j.icarus.2008.10.006 (2008)

Why is reddish Pluto a different colour from its three greyish moons, Charon, Nix and Hydra? Because the three are regularly resurfaced with loose material thrown up in the weak gravity of Nix and Hydra by impacts with small outer-Solar-System objects.

Meanwhile, material ejected fast enough to travel as far as Pluto tends to be moving with sufficient speed to escape the gravity of the Pluto system altogether, according to Alan Stern of the Lunar and Planetary Institute in Houston, Texas. Pluto also repaints itself with an annual frost, and is partly shielded by Charon.

By assuming that the three moons are coated in the same stuff, Stern predicts that Nix and Hydra are both about 50 kilometres in diameter. NASA's New Horizons spacecraft, which Stern is in charge of, will find out for sure in 2015.

BIOLOGY

Mile-high strategies

J. Anim. Ecol. doi: 10.1111/j.1365-2656.2008.01491.x (2008)

A sparrow found in the northern reaches of the Rocky Mountains of North America shows a tradeoff between lifespan and reproductive period according to how high up it lives, and thus the weather conditions and food available to it.

Populations of dark-eyed juncos (*Junco hyemalis*; pictured right) in Canada's Jasper National Park are regularly found living as much as 2,000 metres above sea level. Heather Bears at the University of British Columbia and her colleagues monitored

the songbirds at four 2,000-metre sites and at four 1,000-metre-sites. They found that juncos at the higher elevation lived longer and produced 55–61% fewer offspring per year than those living lower down. When these high-altitude birds did reproduce, however, they invested more heavily in each offspring; their chicks were 15–20% more likely to survive into adulthood and weighed, on average, 11% more at 25 days old.

VIROLOGY

Inside knowledge

Nature Med. doi:10.1038/nm.1885 (2008)

During replication, many viruses trigger certain lipid molecules that are normally found only on the inner layer of the cell membrane to spread into the outer layer. An antibody that looks for these lipids on cell surfaces can selectively pick off infected cells.

Philip Thorpe of the University of Texas Southwestern Medical Center in Dallas and his colleagues have shown this with the antibody bavituximab, which seeks the lipid phosphatidylserine. They cured guinea pigs

with lethal Pichinde virus infections and mice harbouring deadly cytomegalovirus. The former virus is a model for the Lassa fever virus, a potential bioterror agent.

THEORETICAL PHYSICS

Eyeing entanglement

Phys. Rev. A 78, 052110 (2008)

In 1964, John Bell suggested that if Bob saw one of a pair of photons and Alice saw the other, the duo would measure a shared quantum state only if the photons were entangled. But Bob and Alice needn't have carried man-made photon detectors, according to calculations by Nicolas Brunner and his co-workers at the University of Geneva in Switzerland: by adding a few more photons, their eyes would have been good enough.

A healthy human eye cannot spot a single photon, but can usually pick up fewer than ten. This threshold should not hinder a person's ability to detect entanglement in a similar set-up to Bell's experiment in which several photon pairs are emitted at once. Brunner suggests four observers for the task — two Alices and two Bobs — so that the observers can agree on whether they really saw such low light intensities.

ONCOLOGY

Odd ones out

Science doi:10.1126/science.1160165 (2008)

By tracking the expression and location of almost 1,000 proteins in living cells, researchers have found new clues to how some cancer cells resist the chemotherapy drug camptothecin.

Camptothecin targets a DNA-binding protein called TOP1. Ariel Cohen of the



D. GUIN/CORBIS