

can be highly compressed and recover to something close to their original shape when the stress is removed. — MSL

*Science*, this issue p. 1322

## **SOCIAL PSYCHOLOGY** **Moral homeostasis in real life vs. the lab**

Individuals who witnessed a moral deed are more likely than nonwitnesses to perform a moral deed themselves and are also more likely to allow themselves to act immorally. Hofmann *et al.* asked smartphone users to report their encounters with morality (see the Perspective by Graham). Most moral judgment experiments are lab-based and don't allow for conclusions based on what people experience in their daily lives. This field experiment revealed that people experience moral events frequently in daily life. A respondent's ideology influenced the kind of event reported and the frequency, which is consistent with moral foundations theory. — GJC

*Science*, this issue p. 1340;  
see also p. 1242

## **MICROBIAL ECOLOGY** **Patterns of life in the ocean wave**

The open ocean is not uniform. The seas teem with unseen life that has evolved distinctive

patterns of species distribution, much as the land-bound world contains a spectrum of biological provinces. Taking data from genome studies, Hellweger *et al.* devised a model showing how marine bacteria diversified throughout the world's oceans into stable geographic provinces independently of natural selection (see the Perspective by Giovannoni and Nemergut). All that is needed to create these distributions are mutations and ocean currents. — CA

*Science*, this issue p. 1346;  
see also p. 1246

## **ERROR MEMORY** **Practice makes perfect — or does it?**

How do we learn from past errors? Herzfeld *et al.* found that when we practice a movement, the human brain has a memory for errors that is then used to learn faster in new conditions. This memory for error exists in parallel with motor memory's two traditional forms: memory of actions and memory of external perturbations. They also proposed a mathematical model for learning from errors. This model explained previous experimental results and predicted other major findings that they later verified experimentally. — PRS

*Science*, this issue p. 1349

## **MAGNETISM** **All-optical magnetic state switching**

Magneto-optical memory storage media, such as hard drives, use magnetic fields to change the magnetization of memory bits, but the process is slow. Light can often reveal information about the magnetization state of a sample, such as its field direction. Lambert *et al.* show that under the right circumstances, light can also switch the magnetization state of a thin ferromagnetic film. Using light pulses instead of magnetic fields led to ultrafast data memory and data storage. — ISO

*Science*, this issue p. 1337

## **IN OTHER JOURNALS**

Edited by **Melissa McCartney**  
and **Jesse Smith**



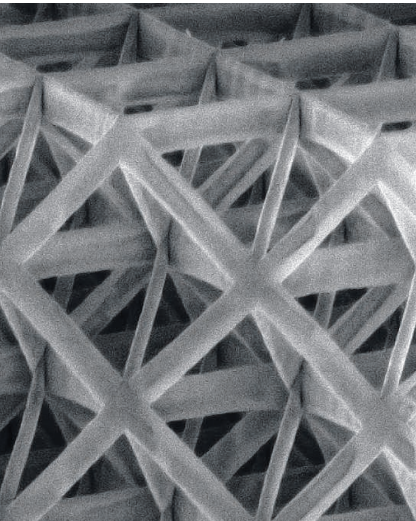
Damage in Hyde Park, London, after the October 1987 storm

## **FOREST ECOLOGY**

### **Legacy of a storm**

**A** severe windstorm has increased plant species diversity in British broadleaved woodlands. In September 1987, hurricane-force winds uprooted an estimated 15 million trees in southeastern England. Smart *et al.* monitored the understory plant community in forest plots before and after the storm, and compared affected and unaffected sites. In the 15 years after the storm, the number of species in wind-damaged plots increased by 32%. Most were native woodland species rather than invasives. This single massive event reversed a 40-year background trend toward decreased plant diversity in undisturbed woodlands. — AMS

*J. Ecol.* 10.1111/1365-2745.12291 (2014).



## ANTIBIOTIC RESISTANCE

### Giving bacteria the old one-two...three-four

Is it possible to streamline the complex task of finding new drugs to fight resistant bacteria and other disease targets? Most biological processes are controlled by complicated regulatory networks, so combinations of two or more drugs are likely to be more effective than any single agent. Finding combinations that work means first screening enormous numbers of possibilities. Cheng *et al.* examined mixtures of genetic elements in millions of different combinations. Those combinations with the desired effect in a biological test could be identified afterward by high-throughput sequencing capable of detecting associated DNA “barcode” identifier sequences. Results are promising and revealed combinations of transcription factors that enhanced lethal effects of an antibiotic by a millionfold. — LBR

*Proc. Natl. Acad. Sci. U.S.A.* 10.1073/pnas.1400093111 (2014).

## INFLUENZA

### Flu survivors are an inflammatory club

Kill it: That is the immune system’s response to most viral infections, including influenza. Eliminating infected cells rids the body of the infection. Heaton *et al.* now report that a special type

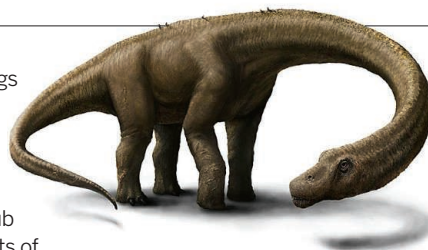
of epithelial cell in the lungs of mice—called club cells—survive influenza infection. How do they do it? Gene expression analysis suggests that club cells express high amounts of antiviral genes in response to infection. Although this process probably helps the animal contain the virus during early infection, club cells also produced pro-inflammatory molecules that cause lung pathology. Whether club cells play a role in inflammation-induced mortality, as seen in the H5N1 and H1N1 influenza pandemics, remains to be seen. — KLM

*J. Exp. Med.* 10.1084/jem.20140488 (2014).

## PALEONTOLOGY

### New titanosaur unearthed in Argentina

Researchers working in Argentina have discovered the most complete skeleton of a titanosaur, giant plant-eating dinosaurs that dominated the Southern Hemisphere beginning 90 million years ago. *Dreadnoughtus schrani* was 26 m long and weighed 59 metric tons—twice as long as *Tyrannosaurus rex* and as heavy as a herd of elephants. Lacovara *et al.* recovered 70% of the dino’s skeleton, including most of its vertebrae but not the head. The researchers say the beast was so big it would have had no fear



of predators (*Dreadnoughtus*, from Old English, means “fearing nothing”). And an examination of its back and shoulder bones indicates that the animal was still growing when it died. — MB

*Sci. Rep.* 10.1038/srep06196 (2014).

## OPTICAL METROLOGY

### Shining light on precision time-keeping

Keeping time typically works by counting the ticks on a clock. A new generation of clocks based on the optical transitions of atoms can sub-divide each second into billions of finer ticks, making it possible to measure even the fleetest of moments. The physical mechanism (or clockwork) of such accurate timepieces is complex, limiting them largely to national laboratories. Papp *et al.* show that a chip-based approach, in which optics are integrated with semiconductor-based microresonators, can provide an easy way to engineer such complex clockwork. Their approach promises a new era of metrology that makes precision timekeeping widely available. — ISO

*Optica* 10.1364/OPTICA.1.000010 (2015).

## DRUG DELIVERY

### A complementary refill? Yes, please!

Drugs delivered throughout the body often cause collateral damage to healthy tissues. When disease or injury is localized, patients can avoid this problem by using a drug-delivery device implanted in the target tissue. However, such devices eventually run out of drugs and must be removed surgically and refilled. Brudno *et al.* designed a drug-delivery device that can be refilled noninvasively and tested it in a mouse tumor model. They made the device from a gel tethered to short DNA sequences. To refill it, they coupled gel strands to drugs and tethered them to complementary DNA sequences, then injected the strands intravenously into the mice. Because of the complementary DNA sequences, the strands homed directly to the device. — PAK

*Proc. Natl. Acad. Sci. U.S.A.* 10.1073/pnas.1413027111 (2014).

## EDUCATION

### Collaborating on assessments

When teachers collaborate with educational researchers, everyone wins: Teachers focus on their practice and researchers learn about the challenges teachers face. Education reforms require these often separate communities to overlap. Szeinberg *et al.* merged both groups and tasked them with developing a sequence of knowledge that students are expected to learn in their chemistry class, as well as a way to assess their learning. Participants evaluated their own work, and responses suggest that the approach to merge theory and practice greatly influenced teachers’ views of assessment. Specifically, teachers reported a greater value on measuring the substance of their students’ thinking and less emphasis on the selection of assessments themselves. — MM

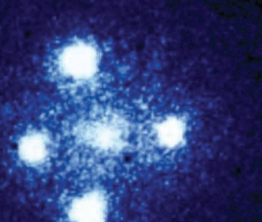
*J. Chem. Educ.* 10.1021/ed5003042 (2014).

## BLACK HOLES

### The spinning heart of the Einstein Cross

Supermassive black holes power entire galaxies from their cores, but how they grew so large is uncertain. When astronomers describe a black hole, they rely on two features: its mass and how fast it spins. The spin rate provides information about how the black hole grew, but it is tricky to measure. Reynolds *et al.* have determined the spin for the most distant quasar yet, a source called the Einstein Cross. This source got its name because the quasar’s light is bent around a massive galaxy and reimaged four times. The high spin rate suggests that several dramatic accretion events produced the black hole rather than many small ones. — MMM

*Astrophys. J. Lett.* 10.1088/2041-8205/792/1/L19 (2014).



# Science

## Collaborating on assessments

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