RESEARCH HIGHLIGHTS

MATERIALS SCIENCE

Carbon on display

Nano Lett. doi:10.1021/nl080649i (2008)

Lumps of graphite are sooty; its constituent layers of graphene, however, are transparent, a property that researchers have used in a liquid-crystal device. Kostya Novoselov at the University of Manchester, UK, and his co-workers have shown that an electrode made from a thin graphene film can switch a device from opaque to transparent.

Most optical display devices have indium tin oxide as the transparent conductor, but this compound is apt to degrade because its ions are mobile. Graphene films, by contrast, are chemically stable and strong. The researchers find that the films can be cheaply spray-deposited onto glass from a suspension in an organic solvent.

ORGANIC CHEMISTRY

Flushing out HIV

Science **320,** 649–652 (2008)

The possibility of adding prostratin to antiretroviral therapies has been held back because it is scarce in nature, an impediment that the chemical's laboratory synthesis has just removed. Prostratin activates latent HIV viruses even in patients with undetectable viral loads, flushing out viruses that would otherwise be hidden. Including it in drug regimes might make patients who stop treatment after a few years less likely to experience 'viral rebound'.

Paul Wender and his colleagues at Stanford University in California found that they could make prostratin by first cleaving and then re-establishing the ring of three carbon atoms in phorbol, which is readily available. The process of putting the ring back together involves four steps that can be tweaked to produce various similar chemicals.

P. STEFANSSON/REUTERS

Climatic volcanoes

Geophys. Res. Lett. doi:10.1029/2008GL033510 (2008)

The Vatnajökull ice cap in Iceland lost about a tenth of its mass during the twentieth century. As a result, the crust around its edges has risen and this, according to new research, has led to the rapid build-up of significant volumes of magma.

The finding suggests that melting glaciers can increase local volcanic activity over time periods that are relevant to humans. Carolina Pagli of the University of Leeds, UK, and Freysteinn Sigmundsson of the University of Iceland in Reykjavík calculated the rate of change of pressure decrease in the mantle beneath the 8,000-square-kilometre Vatnajökull ice cap. They then built a model that estimated the extra magma produced in the area to be 1.4 cubic kilometres per century. Taking the last major eruption below the ice cap as a metric, that would be equivalent to an eruption every 30 years if all the magma were ejected.

M. LANE/NHPA WRITEIMAGESPECS

DEVELOPMENTAL BIOLOGY

Antler insight

PLoS One **3,** e2064 (2008)

Hans Rolf of the University of Göttingen in Germany and his colleagues report that they have found evidence of stem cells in the antler 'growth zones' of fallow deer (*Dama dama*; pictured left). They hunted for stem-cell 'markers' such as STRO-1 in several tissues located inside regenerating antlers and in regions called pedicles at the antlers' bases, pinpointing their quarry in several tissues.

The annual regrowth of antlers has long been considered the only case of complete appendage regeneration in mammals, and so this finding may prove useful in regenerative medicine.

NEUROSCIENCE

Bird brains

Science **320,** 630–634 (2008)

The babbling calls of baby songbirds involve separate brain circuitry from that used to generate more complex adult song, report neuroscientists at the Massachusetts Institute of Technology in Cambridge.

Michale Fee and his team gave adult zebra finches a drug that stopped the "high vocal centre" — a brain region that enables birds to sing melodious 'syllable' sequences — from working. The birds reverted to the stereotypical babblings of one-month-old chicks within 20 minutes, but regained their tuneful adult song when the drug wore off. Another brain region called the lateral magnocellular nucleus of the nidopallium proved necessary for juvenile babbles but not for adult song.

MICROBIOLOGY

A genetic monster

Proc. Natl Acad. Sci. USA **105,** 6730–6734 (2008)

A gargantuan bacterium carries tens of thousands of copies of its genome, researchers have found.

One species of the cigar-shaped bacterium *Epulopiscium* lives in the intestines of the unicornfish *Naso tonganus*, and can grow to more than half a millimetre in length. Esther