Neuroscience

Depression and gene expression

Proc. Natl Acad. Sci. USA **101,** 15506–15511 (2004)

Major depressive disorder is a serious affliction for all too many people. Using microarray technology, S. J. Evans *et al.* show that changes in certain gene transcripts could help to explain the molecular basis of this condition.

The authors assessed levels of gene activity in post-mortem samples of brain tissue from patients who had suffered from major depressive disorder, as well as another mood disorder, and from control subjects with no history of psychiatric problems. They found altered expression of fibroblast growth factor (FGF) in the depressed group only; in fact, in people with major depressive disorder, several genes encoding FGFs were coordinately disrupted. These findings support the hypothesis that altered growth-factor activity in the brain contributes to mood disorders.

Evans *et al.* also demonstrate that certain antidepressants might have a moderating effect on changes in the levels of some FGF transcripts: these changes were less profound in patients taking drugs known as 'specific serotonin reuptake inhibitors'. The researchers accordingly point out that the FGF system could be involved in the mechanism by which antidepressants operate. **Roxanne Khamsi**

Animal behaviour

Tools and termites

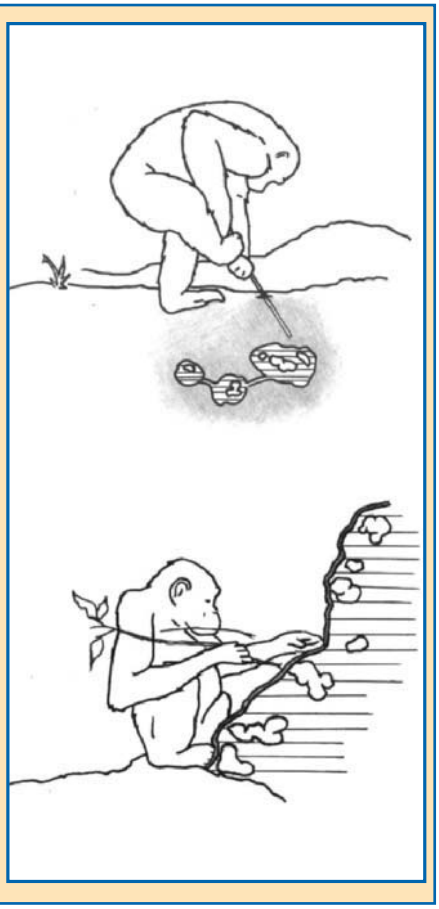
Am. Nat. **164,** 567–581 (2004)

Tool use by apes is well documented. But according to Crickette Sanz and colleagues, who have followed the behaviour of groups of chimpanzees in the Nouabalé-Ndoki National Park in Congo, there is more to be discovered.

Over six months, Sanz *et al.* used remote video recording to observe how chimps tackled the tempting meals of termites to be found in nests both below and above ground. The lower drawing shows an adult female, deep in concentration at a termite mound, and summarizes one of the authors' main findings.

They found that chimps used one kind of tool, a 'perforating twig', to open up sealed holes on the mound surface. As the termites rush to defend their home, the chimp switches to a more delicate 'brush-tip fishing probe', seen here in her mouth, to extract the termite dinner. Underground nests were breached with a different implement, a 'puncturing stick', as shown in the upper sketch. Subtle differences in practice between chimp groups raise the question as to what extent ecological factors or different group traditions are responsible. **Tim Lincoln**

Video recordings of chimpanzee performance are at www.journals.uchicago.edu/AN/journal/issues/v164n5/40471/40471.html



D. MORGAN, WILDLIFE CONSERV. SOC.

Astrophysics

Ageing dwarfs still active

Astrophys. J. Rapid release 6 October 2004

The hot, ionized gas swirling inside a star generates a magnetic field. This dynamo effect is characteristic of all but the coolest stars, and in the star's outer atmosphere, or corona, it can generate flares of material that emit a sudden burst of X-rays.

But brown dwarfs are different. These glowing cinders are 'failed' stars that do not have enough mass to generate the pressure needed for hydrogen fusion. Some astronomers believe that the dynamo switches off in older, cooler dwarfs, as their ionized matter becomes neutral.

B. Stelzer now reports an X-ray flare from an older brown dwarf (Gl 569Bab), and sustained X-ray emission from its corona. She claims that this is probably the first detection of quiescent X-ray emission from a brown-dwarf corona, although she notes the possibility that the X-rays are some kind of afterglow from the flare.

Only one previous example of an X-ray flare from an older brown dwarf is known. This new sighting not only confirms that even ageing brown dwarfs can sustain an active magnetic field, but also that they can produce a constant X-ray glow from a heated corona even in their chilly later years. **Mark Peplow**

Mechanics

On the rebound

Phys. Rev. Lett. **93,** 154301 (2004)

How can a ball bounce up from the floor at a steeper angle than that at which it struck it? Hiroto Kuninaka and Hisao Hayakawa show that this seemingly bizarre phenomenon has a perfectly rational explanation.

Their calculations and computer simulations show that it can happen when a hard ball hits a softer surface. Deformation of the surface — which is pushed into a little ridge behind the point of impact — causes some of the ball's horizontal velocity to be transferred to vertical velocity. This can produce a coefficient of normal restitution, e — in effect, the ratio of the final to initial vertical components of the velocity — that is greater than 1. Kuninaka and Hayakawa predict that for sufficiently oblique impacts (about 11°), e can be as large as 1.3.

These findings bear out earlier empirical observations showing that e could exceed 1 for glancing impacts. But as the wall must be softer than the ball, it won't work on the squash court. **Philip Ball**

Population biology

Cannibal cycling

Proc. R. Soc. Lond. B (suppl.)
doi:10.1098/rsbl.2004.0231 (2004)

The curious fluctuations in populations of the Indonesian 28-spot ladybeetle, *Epilachna vigintioctopunctata*, may have a rather grisly explanation. The cycles have a period roughly the same as the insect's development time to adulthood, and are only seen in juvenile stages. They are best explained, say Koji Nakamura and colleagues, by the larvae turning cannibal when food is short.

If the pattern were due to a natural enemy, such as a predator or parasite, both adult and juvenile populations of the ladybeetle would fluctuate. So Nakamura *et al.* propose that the cycles arise from within the beetle species — as larval populations grow, the larvae are forced to start eating the eggs of their fellow ladybeetles.

The authors examined data from *E. vigintioctopunctata* censuses taken in Indonesia in the 1980s and 1990s. At Padang, the beetles showed a generation time of 45 days, and their egg numbers rose and fell roughly every 50 days. This provides real-world support for the cannibalism theory, and mirrors earlier findings in lab cultures of the flour beetle *Tribolium*. **Michael Hopkin**