

WEEKLY | NEWS IDEAS INNOVATION

NewScientist

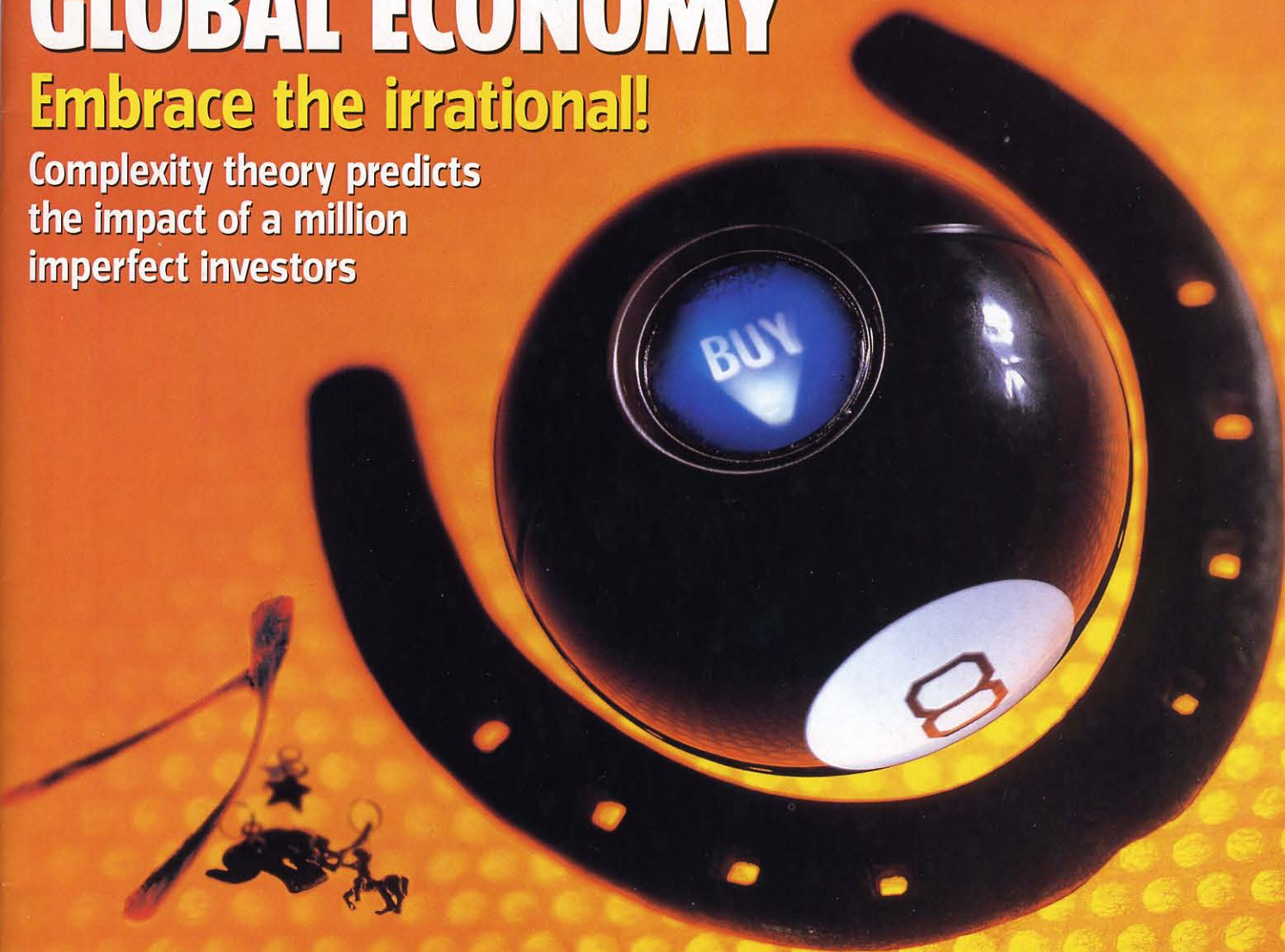
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"Brazil's deforestation rates are
skyrocketing and beef production
for export is to blame"

Have conservation groups taken their eye off the ball? page 14

SOUNDBITES

“In this administration, science strongly informs policy. It is important to remember, however, that even when the science is clear – and often it is not – it is but one input into the policy process.”

Presidential science adviser John H. Marburger III responds to accusations that the Bush administration has censored science to suit its policy (www.ostp.gov, 2 April)

“Republicans can’t stress enough that extremists are screaming ‘Doomsday!’ when the environment is actually seeing a new and better day.”

An extract from a **leaked email** sent to Republican press secretaries (*The Observer*, London, 4 April)

“The forest service in the UK is in Edinburgh because there’s not a tree left in England.”

Tasmanian premier Paul Lennon reacting to the call by some UK MPs for tourists to boycott Tasmania in protest against its logging of ancient forests (*The Independent*, London, 5 April).

“I believe Iraqi scientists are being targeted by foreign powers, most probably Israel.”

Usama al-Ani, director of Iraq’s Ministry of Higher Education and Scientific Research, on assassination claims (Aljazeera.net, 31 March)

“This should be a wake-up call that we need to take a closer look at how early media use affects children.”

Vicky Rideout of the Kaiser Family Foundation on a study suggesting the more television toddlers watch, the more likely they are to have attention problems at school (*USA Today*, 5 April)



Is the panda's end written in its cells?

Chromosome clock ticks out our fate

KATE RAVILIOUS

DID Charles Darwin get it wrong? A thought-provoking theory suggests that natural selection may not be evolution’s main driver after all. Instead, evolution and extinction may be controlled by an internal clock in every species.

Almost all the species that ever lived have become extinct. Mass extinction events account for only 4 per cent of this total, so what snuffed out the rest?

Reinhard Stindl of the Institute of Medical Biology in Vienna, Austria, is proposing that the protective caps on the ends of chromosomes, called telomeres, act like a timer, eroding slowly with each generation and inexorably counting the years toward a species’ doom. Natural selection is still important, he says, but it is telomere erosion that ultimately limits how long any species can exist.

Each time cells divide, they can never quite copy their telomeres completely, so the telomeres

gradually get shorter. In germ cells and young fetuses, an enzyme called telomerase rebuilds them. It is generally thought that this keeps telomere length stable from one generation to the next, but Stindl thinks there is a tiny reduction in the average telomere length with each generation.

If telomeres start out long in new species and gradually shorten over time, that could explain why their lengths vary so much between species (*The Journal of Experimental Zoology B*, vol 302, p 111). Some birds have telomeres up to a million DNA base pairs long, for example, while human telomeres are relatively short – just 10,000 or so base pairs.

After many thousands of generations, a species would have critically short telomeres. How long it takes would depend on the length of the telomeres at the start, and the species’ generation time. But when a species’ time was up, individuals would suffer from diseases related to chromosomal instability or limited tissue

regeneration, such as cancer and immunodeficiency. “A high incidence of telomere-related diseases could lead to a population crash,” says Stindl. “It could explain the disappearance of a seemingly successful species, like Neanderthal man, with no need for external factors such as climate change.”

After a population crash isolated groups are likely to survive, and Stindl suggests that inbreeding within these groups could “reset” the clock, elongating the telomeres and potentially starting new species. He is not sure how this would happen. But he points out that inbred lab mice have far longer telomeres than their wild ancestors.

The idea helps to explain some of the more mysterious patterns seen in evolution and extinction, such as the fits and starts in the fossil record. But some scientists will take convincing. “The hypothesis is interesting, and may even apply in some cases,” says David Jablonski, a palaeontologist at the University of Chicago. But it needs to be tested against other extinction mechanisms, he says.

Stindl agrees that more work needs to be done. One test would be to compare average telomere lengths of successful species with those of endangered ones. ●