

One worm, two worms, three...

ROBINS appear to have an eye for numbers, at least when it comes to choosing the biggest meal.

"Discriminating between two large groups of objects that are close in number would be pretty exceptional for any animal or human, but that's exactly what the robins did," says Alexis Garland at Victoria University of Wellington in New Zealand.

Garland let 36 wild North Island robins choose one of two wells after seeing different numbers of mealworms dropped en masse into each. Most picked the fuller well as long as the ratio was below 0.75 - correctly selecting, say, 64 over 32 worms. The mechanism at work here is called ratio-based representation and involves guessing which large group of items has the bigger bulk.

The robins did even better when the worms were dropped into the wells one by one and covered so that the masses could not be compared: they managed a ratio of 0.88, albeit with a smaller number of worms. For the largest trial at this ratio - 14 versus 16 worms - most robins chose correctly (*Animal Cognition*, DOI: 10.1007/s10071-012-0537-3).

Other animals tested like this have only managed to track about four items. Robins hide multiple food items in several places so it may be advantageous to distinguish more from less quickly, says Garland.



GUILAUME BOUTELOUBIS/PHOTO/FLPA

Natural immunity may protect Peruvians from rabies

HERE'S a study with bite. A group of Peruvians thought to have survived untreated rabies infection have bucked the notion that the virus is lethal to humans.

A team led by Amy Gilbert of the US Centers for Disease Control and Prevention, collaborating with Peru's Ministry of Health, visited two communities in a remote part of the Peruvian Amazon. Outbreaks of rabies infection caused by bites from vampire bats have been documented regularly in Peru over recent decades.

When the team sampled the

blood of 63 people from these communities they found that seven of them had rabies-virus-neutralising antibodies. One of these people had received a rabies vaccine but the other six had not, though they reported having been bitten by bats in the past.

The antibodies are produced when the body is directly exposed to rabies or exposed to a vaccine for the virus. The team concluded that the six unvaccinated people with the antibodies must have been exposed to rabies without dying from it, suggesting they

have a natural immunity (*American Journal of Tropical Medicine and Hygiene*, DOI: 10.4269/ajtmh.2012.11-0689).

The researchers admit that they don't yet know whether these people actually developed symptoms of an infection and recovered or were exposed to a small dose of the virus which they were able to fight off. Regardless, if further studies confirm that there are populations of people with a greater natural immunity to rabies, the discovery could pave the way for new treatments.

Moons of Uranus race to their doom

A PAIR of star-cross'd lovers orbit Uranus, and when they rush to meet their fate, the duo could leave the cosmic stage littered with bodies.

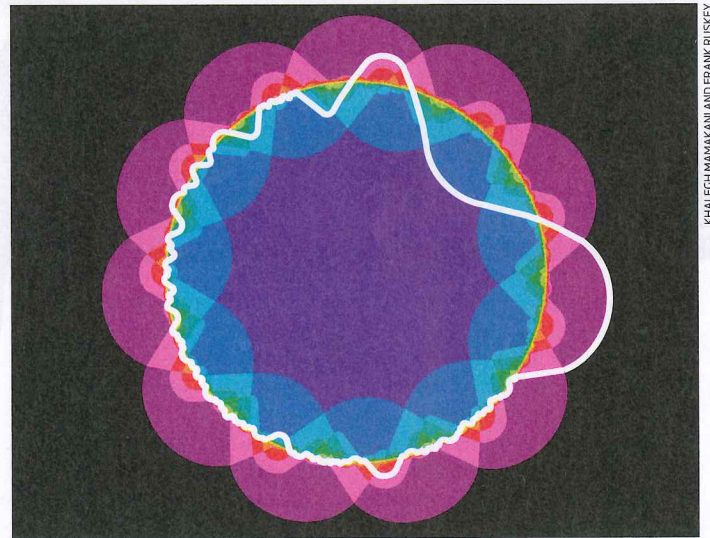
New orbital simulations predict that several of the planet's small inner moons are on collision courses. But the chaos might not mean the final curtain for these satellites. It may instead be part of a cycle of death and rebirth.

According to the models from the SETI Institute, the small moon Cupid is doomed to collide with larger Belinda in as little as 1000 years.

"Almost no matter what assumptions we make, Cupid is going to die," says Robert French of SETI. Four more of Uranus's moons seem destined for similar untimely ends.

That may not be the full story. Uranus has a small, faint ring just inside Cupid's orbit that should have coalesced to form a moon, says French. And Cupid has such a short life expectancy, he says, that he's surprised it hasn't already broken up.

He suggests that the moons and rings are constantly recycling in a process similar to what happens in Saturn's F ring.



KHALEGH MAMAKANI AND FRANK RUSKEY

Logic blooms with new Venn diagram

IN THE garden of mathematics, a new rose has blossomed: a Venn diagram for 11 sets of objects.

Invented in the 1880s, Venn diagrams use overlapping circles to show all possible relationships between sets. But diagrams for more than two or three sets often require circles to be distorted until they are too elaborate to be useful.

Mathematicians have proved that symmetrical diagrams, which are easier to understand, are possible only for prime numbers. They also say that for purity's sake, diagrams must be "simple", meaning no more

than two curves cross at any point.

Combing through computer simulations of various configurations, Khalegh Mamakani and Frank Ruskey at the University of Victoria in British Columbia, Canada, hit on the simple, symmetric 11-set Venn diagram above (arxiv.org/abs/1207.6452). One of the sets is outlined in white, and the colours correspond to the number of overlapping sets. The team called their creation Newroz, Kurdish for "the new day".

"After searching for them for so long, the big surprise was to find one at all," says Ruskey.