



BEYOND THE looking glass

Gang-raping dolphins? Young elephants murdering rhinos? Baboon sons copulating with their mothers? This is not the stuff of B-grade movies, but observed and observable animal behaviour in the wild. Ethology, the science of animal behaviour, throws some unexpected curves that are perplexing, even to scientists. To us non-scientists, such behaviour can seem weird, abhorrent, maybe even pathological. But what's the scientific logic behind it? Is there such a thing as 'pathological' animal behaviour, or is it human projection – anthropomorphising – to view it that way? **Melissa Siebert** chatted to some experts about why animals behave the way they do.

Four related aspects or questions explain why an animal behaves a certain way at a given time, argues author and zoologist Dr Peter Apps. Causation addresses the environmental stimulus and change within the animal that has triggered a certain behaviour; development looks at whether the behaviour is innate or learned; function asks what the behaviour is for; and evolution examines the ancestral behaviours that led to what we see today.

The lens through which we, as non-scientists, view and assess 'pathological' and other behaviour is psychology. But, says Apps, zoologists interpret animal behaviour according to its contribution to evolutionary fitness – or how successfully the animal passes copies of its genes to subsequent generations. When this biological imperative to reproduce oneself is threatened – through food or mate scarcity, or other changes in the environment – animals can behave bizarrely. Dr Justin O'Riain, a behavioural ecologist at the University of Cape Town (UCT), cautions against using 'pathological' to characterise animals behaving badly, or strangely.

'I'd stay away from "pathology" – that's a very strong word,' he says. "'Maladaptive" is a better one – though things that appear maladaptive usually turn out to be strongly adaptive.' O'Riain cites the theory of evolution

and inclusive fitness as the primary driver behind animal behaviour. 'Everything in biology is dead simple: all it involves is the number of copies of genes left behind.'

Like a detective, O'Riain has investigated numerous cases chronicling strange behaviour across many species. He relates the well-reported story of a lioness in the Samburu National Park in Kenya that, between 2002 and 2003, sequentially 'adopted' six oryx calves after her presence had driven away their biological mothers. Analysts attributed the lioness' behaviour to

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unfulfilled maternal instincts, among other things; some claimed she was barren, or was still young and just hadn't come into oestrus yet.

'This was big news, the press loved it,' O'Riain says, referring to the first of the reported 'adoptions', which lasted 16 days until a male lion killed and ate the calf. 'There is a hormonal predisposition towards mothering,' he con-

tinues. 'This young oryx ran up to the lioness as a baby, with no fear. It saw a large brown thing and thought it was its mum, and the lioness adopted it. Of course it died, so it wasn't such a nice story after all.'

And the explanation behind it? 'It all comes down to hormones and predispositions,' says O'Riain. 'It's universal. You show a picture of a baby seal to students and it's mostly the girls who go "Ahhh!"'

Hormones make a lot of adaptive sense in the animal world. Prolactin, for instance, is the 'hormone of parenting', O'Riain says. 'One study of wolves showed that prolactin levels increase in all pack members, males and females, with the arrival of a new litter. The hormone drops aggression levels, effectively enhancing parenting. You've got the alpha pair breeding and a whole lot of other adults who could eat their offspring – you need them to be favourably predisposed towards the new pups. Increased levels are prolactin – very important for parenting and alloparenting, or parenting offspring that aren't yours.'

Here at work again is the inclusive fitness theory: wolves in a pack are generally related, so they share genes with one another's offspring as well. And any behaviour that enhances the survival of pups that are related to you is adaptive. ▶

OPPOSITE A herd of elephants moves through the lush Caprivi vegetation.

BELOW Young hyaenas. Siblings will start to nip and gambol with each other within hours of birth to establish rank.

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But sometimes even the animals' drive to reproduce themselves goes awry. A lot of weird animal behaviour happens in the context of mating rituals, especially if potential mates are few or uncooperative. O'Riain describes what he calls 'gang-raping' dolphins – a far cry from the playful image usually associated with these marine mammals.

'There are pods of bachelor dolphins which, when they want to reproduce, need to gain access

there are pods of bachelor dolphins which will **ISOLATE A FEMALE FROM HER POD AND BEAT HER WITH THEIR NOSES UNTIL SHE SUBMITS**

to females. And, sometimes females travelling together may not choose to mate with these young outlaws,' O'Riain says. 'The males will then isolate a female from her

pod and beat her with their noses until she submits. There's a hell of a lot of reproduction going on in the animal world that, to some extent, is forced.'

A good example is the case of the male scorpion fly, an insect found in many parts of

the world, which engages in rituals that are not unlike human courtship – up to a point.

'If there are lots of females available,' O'Riain says, 'the male courts one by presenting her with a dead food item or, if that fails, a saliva ball – a nuptial gift. If the gift is good, it is a sign of his quality and the female will mate with him. If there is no food available, or not enough females around, the males will force copulation. There's no nuptial gift and, rather than going into a receptive position, the female fights to get away. The male subdues her because he's stronger, and has his way.'

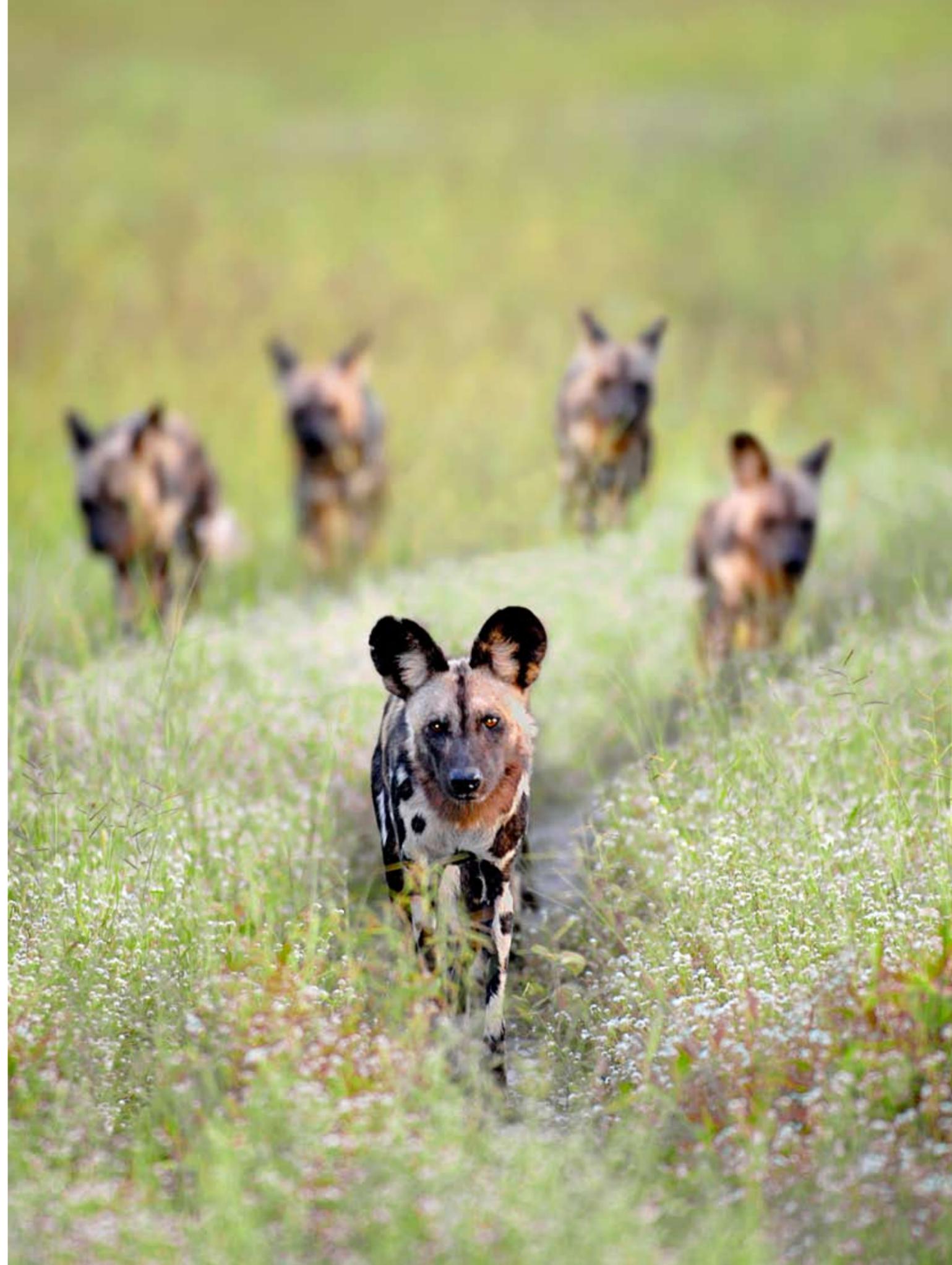
'It all turns out to be dependent on prey availability and the number of females,' continues O'Riain. 'When these are in perfect ratio, the boys do what is normal – they present their gifts. But when they don't have gifts and there are not enough females, they resort to this [forced copulation].'

The insect world is full of peculiar mating behaviour, but perhaps strangest of all is the praying mantis. When the female decides to mate with a male, she must sever a cervical ganglion so he will ejaculate – she bites his neck off. 'She's got his good genes, she doesn't want him mating with other females,' explains O'Riain. 'It's a way of ensuring mate fidelity, the ultimate mate fidelity.'

From a human perspective, some mating patterns in the animal world seem to border on incest or promiscuity. Here again, though, there's a natural logic at work. O'Riain cites the case of baboons; he heads up the Baboon Research Project at UCT and spends many hours with them. 'Female baboons mate with a lot of males,' he says. ▶



DALE MORRIS (2)





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'The females will even let their sons copulate with them, although often the son is young and not yet producing sperm. Why? A very nice answer to this is that if many males think they might be a father of your offspring, they will be favourably predisposed towards it. If anyone picks on your baby, you might have five males saying, "Hey, that's my child!" and defending it. The female is just looking after her future investment.'

While mating habits such as these might raise a few eyebrows in the

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human world, probably the most abhorrent animal behaviour – to the average person at least – is infanticide. The adult males of a number of species – lions, leopards, hippos, tree squirrels, baboons, vervet monkeys and zebras, for instance – kill youngsters, usually in situations where mates take over breeding groups. Adult females kill infants (usually the offspring of others) far less frequently, although it has been documented in zebras, social mongooses and African wild dogs.

But as with most other seemingly deviant animal behaviour, nature has a rationale. A male lion bent on taking over a pride has good reason to kill the cubs before mating with the lionesses. 'The male lion wants his genes passed on,' says O'Riain. 'The drive to commit infanticide is very strong. Why should you wait for the cubs to stop nursing before the best females are ready to copulate? They won't come into oestrus until they get rid of the cubs. You, the male lion, can accelerate that process.'

Lionesses resist this male drive by leading solitary lifestyles for roughly three weeks after their cubs are born – hiding them in the bush to protect them and even mating with the usurper to dupe him into thinking the cubs are his.

Certain species cause others to behave pathologically, in some cases driving them towards self-destruction. In what is known as 'host manipulation', some parasites cause their hosts to make themselves more vulnerable so that the parasite can move on to the next stage of its life cycle. One example, says O'Riain, is a parasite-infested snail. 'The snail should stay hidden during the day, but this parasite changes its behaviour so it emerges from its hiding place and exposes itself to predators,' he says. 'Then the parasite travels to its eyes and causes them to pulse colours – it's like a neon sign flashing "Eat me, eat me!" So the snail has not only climbed out and made itself spatially vulnerable, it's flashing eyes will attract a bird to come along and eat, thereby helping the parasite to complete its life cycle. It's only when you figure out that the driver of the behaviour is a parasite that you understand what natural selection can get up to.'

This biological opportunism drives a lot of animal behaviour that humans might regard as cruel. Female evictions – animal moms kicking their offspring out of the family group – 'crystallise the whole conflict between the individual and the collective in animal societies', says O'Riain. 'Almost all cooperative behaviour has selfish underpinnings.' As witnessed in meerkat groups and graphically depicted in the television series *Meerkat Manor*,▶

OPPOSITE The Chyulu Hills are at the centre of a cattle- and people-free conservation area which will eventually link them with both the Tsavo and Amboseli national parks, establishing a major corridor for wildlife in the region.

BELOW Joel Talala, like the other Maasai *morans* who work on the Mbirikani Group Ranch, is committed to helping to conserve his land for future generations by monitoring lion movements and water usage, and forming anti-poaching patrols.



DALE MORRIS

boys behaving badly

One of the most famous episodes of manifestly deviant animal behaviour occurred in South Africa's Pilanesberg Game Reserve between 1992 and 1997, when young male elephants in musth chased and killed more than 40 white rhinos. Musth, a heightened state of aggression and sexual activity triggered by surges in testosterone in male elephants, usually first occurs when the bulls are aged between 25 and 30. But when these youngsters, the orphans of culls, were translocated to Pilanesberg in the 1980s, they entered musth earlier and started breeding at the age of about 18. Eventually they started attacking the local white rhino population.

'When the rhino backed away, de-escalated, the elephants did not stop – to de-escalate would be normal in such interactions,' says conservation ecologist Rob Slotow, director of the Amarula Elephant Research Programme at the University of KwaZulu-Natal. 'Instead, they chased the rhinos for long distances, kilometres in some instances, stabbing at them with their tusks and eventually killing some of them. This would be abnormal, and the interaction/chasing was compulsive. I would therefore classify this as pathological behaviour.'

The cause of the problem, Slotow explains, was an absence of older male elephants, whose presence would have suppressed the onset of musth in the youths. Once scientists identified the physiological basis of the pathological behaviour, they were able to correct it. How? When six older males were introduced to the reserve, the young male elephants came out of musth to preserve themselves – and their reproductive fitness – by deferring to the higher-ranking, more mature males.

booting out your daughter may not seem like maternal behaviour, but slots in nicely with the inclusive fitness principle.

'As the dominant female in a meerkat family group,' explains O'Riain, 'you kick out your daughter and she becomes a satellite. Perhaps she joins up with males from another group and forms a new one. Now you're breeding and she's also breeding and making puppies, but not on the same territory. Your daughter is making copies of your genes somewhere else. That's a brilliant thing; you are expanding your gene representation. So the "nasty" behaviour of eviction has a very satisfactory long-term explanation.'

A possible epilogue eases the blow of being cast out: should the daughter not find a mate or a new group, she is generally welcomed back to help babysit her mom's new pups and forage for food.

Some scientists describe 'pathological' animal behaviour solely in connection with captivity. 'The only situation where you get pathological animal behaviour,' says Dr Nigel Bennett, a comparative physiologist

animal social systems are different to human ones **AND THERE IS NO LOGICAL BASIS FOR IMPOSING HUMAN MORALITY ON ANIMAL BEHAVIOUR**

based at the University of Pretoria, 'is when you take an animal out of the wild and house it in a small cage. Then the animal starts to show displacement behaviour in the form of pacing or other repetitive actions. I think it must cause mental illness in higher-thinking organisms.

'I often think humans attempt to anthropomorphise animal behaviour,' he adds. 'In human society for example,

(well, in most modern societies) cannibalism is frowned upon, but in the animal kingdom it is common in many taxa. It is not surprising, as consumption of a resource, even of the same species, is a valuable commodity.

The adults of many reptile species consume the young of the same species. In several spiders and the praying mantis, the male is consumed by the female. Homosexual behaviour is seen in many animal species – dogs often mount other dogs. A male rabbit may mount and copulate with another male. Is this homosexuality, or do animals simply get the wrong message? Do we try to attribute human values to such behaviours?'

Apps argues that we do. 'The pathology label for human behaviour is socially constructed,' he says. 'A wide range of behaviours that are labelled as "pathological" when humans do them are also seen in animals, but in animals these behaviours are usually not associated with pathologies in either cause or outcome. Animal social systems are different to human ones, and there is no logical basis for imposing human morality on animal behaviour.

'This also applies the other way,' he adds. 'The behaviour of animals does not provide moral lessons for humans, although it might provide suggestions about what underlies human behaviour, both desirable and undesirable.' ■

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TIM JACKSON