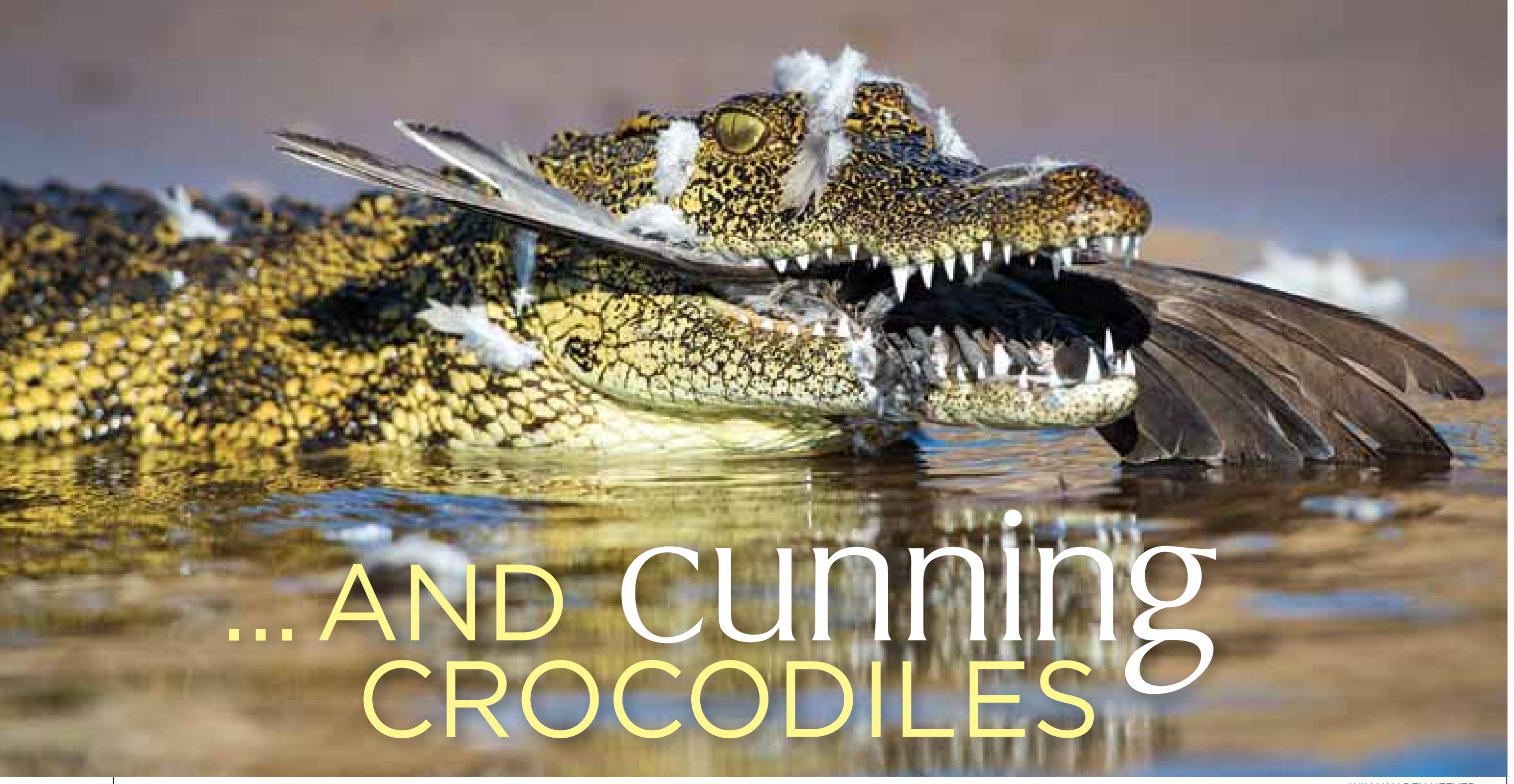

... AND cunning CROCODILES

WIM VAN DEN HEEVER

A recent issue of *African Birdlife* highlighted how some birds use lures to attract prey (vol. 1(3), p. 47). This seemingly intelligent behaviour is known from only a handful of birds, and relatively few other animals. There have been no well-documented records of tool use at all from reptiles and amphibians.

Saltwater crocodiles have been suspected to use scraps of fish prey to attract birds with the intention of adding them to the menu, but it was not clear whether this behaviour was deliberate or accidental. Now a recent paper by Vladimir Dinets and colleagues (*Ethology, Ecology & Evolution* 2013, doi: 10.1080/03949370.2013.858276) reports how American alligators in the southern USA and mugger crocodiles in India apparently use lures to catch birds.

In both cases the crafty crocs balance sticks on their snouts to entice nest-building herons, egrets and other colonial waterbirds to come close enough to snatch and eat. Amazingly, the crocodiles only make use of this technique during the birds' breeding season, and mainly at the start of the season when competition for twigs to build nests is most intense.

The crocodiles also focus their efforts close to heronries, where the chance of success is greatest. The authors report how crocodilians lie in wait for hours with twigs balanced carefully on their snouts, keeping them in place if they move to a new spot.

A paper by Sean Doody and colleagues (2012, *Ethology* 119: 1–9) shows how people tend to dismiss reptiles as being largely non-social animals, when in fact there is increasing evidence of social interactions among many species. And crocodiles appear to be among the most social and intelligent of reptiles. Their long-distance underwater communication system has been little studied, as have their often complex mating systems. Communal breeding and sharing of nest-guarding duties has been recorded in at least one species, and bi-parental care described for other species. Some crocodiles have even been recorded to hunt in groups, with individuals assuming different roles in the hunting party.

PETER RYAN

DO INTELLIGENT BIRDS **STRESS LESS?**

In the past decade it has become clear that birds with larger brains – especially those with larger forebrains associated with learning and behavioural innovation – have higher survival rates and are better able to adapt to changing conditions than small-brained birds. This is despite the fact that developing and maintaining a large brain is energetically expensive, and being innovative is often costly, resulting in higher endoparasite loads and potentially an increased risk of predation. It is not a coincidence that large-brained passerines tend to be the most successful invasive bird species globally, and in the UK brain size predicts bird population trends over the past few decades.

The conventional explanation for the success of large-brained birds is that their behavioural flexibility allows them to better adapt to changing circumstances than species with smaller brains. However, there might be an added advantage to having a large brain. A paper by Ádám Lendvai and colleagues (*Proceedings of the Royal Society B* 280: 20131734) suggests that large-brained birds are better able to cope with stress associated with novel stimuli.

Birds, like all vertebrates, react to stressful events with the neuroendocrine stress response. This releases glucocorticoid hormones, which focus the body's physiology on immediate survival functions such as the 'fight or flight' response. However, persistent elevated levels of these hormones may impact survival and reproduction through reduced immune function and impaired metabolic efficiency.

Lendvai and his colleagues found that birds with large brains relative to their body size had lower levels of glucocorticoid hormones than species with small brains. They argue that the evolution of a large brain, and the associated behavioural flexibility associated with it, buffers birds against stressful stimuli, and that intelligence represents a general alternative to the neuroendocrine stress response.

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