

*Best of the Blogs*

## BIOLOGY

**A Feathered Innovator**

In a first for its species,  
a captive cockatoo creates a tool

Since the early 1960s membership in the club of tool users has expanded from humans to chimpanzees and beyond. To date, it includes elephants, dolphins, octopuses, crows, ravens, rooks, jays, dingoes and dogs (sort of). Among birds, tool use has been well documented in corvids (crows, rooks, jays, ravens), but evidence is scant in other bird families.

Now a parrot named Figaro may pave the way for admission into the tool-use club for his species, Goffin's cockatoo, also known as the Tanimbar corella or Goffin's corella (*Cacatua goffini*). Figaro is part of a captive colony of cockatoos in the department of cognitive biology at the University of Vienna. One day the male parrot dropped a pebble through an opening in the wire mesh surrounding the aviary in which he was housed, where it fell onto a wood beam. Figaro tried in vain to retrieve the pebble with his claw. Frustrated, he flew away, retrieved a small piece of bamboo and, holding it in his beak, attempted to use it to nudge the pebble back into his enclosure. He was unsuccessful. Luckily, a student observer noticed the exciting behavior and reported it to the researchers. No Goffin's cockatoo in the wild had ever been recorded using a tool, so the behavior was remarkable.

Yet was it a fluke? To find out, the researchers embarked on a series of experiments. In 10 different trials over the course of three days, they placed small cashews on the wood beam outside the aviary, just as the pebble was in the initial observation. In the first test, Figaro started by trying a stick that had been lying on the floor of the enclosure, but it was too short. He then broke a splinter off of a wood beam and, holding it in his beak, successfully retrieved the nut. In all, it took him 25 minutes to get his snack. Not only was he able to use a preexisting tool, he also spontaneously manufactured one. In the second through



Tool-using Figaro

10th trials, his performance was significantly faster. Ten times in a row, Figaro successfully found or fabricated tools to retrieve a cashew.

What makes this particularly exciting is that Figaro is a parrot, not a corvid. Corvids routinely use their beaks to modify twigs and sticks for nest building, so the cognitive leap to tool manufacture makes anatomical and ecological sense. Parrots, however, nest in naturally occurring cavities found in trees. Figaro's example shows that tool use can spontaneously develop in an individual whose intelligence had not been explicitly shaped by evolution for tool use.

As vocal-learning birds, parrots have long been studied for insights into language, but it seems as if the ability to use tools for solving problems also exists within their cognitive tool kit—at least under certain conditions. Identifying just what those conditions are now falls to the researchers, who are planning to see how different experiences throughout a cockatoo's development could contribute to tool-related abilities, as well as the extent to which tool use could spread to other cockatoos through social learning.

—Jason G. Goldman

Adapted from *The Thoughtful Animal* at [blogs.ScientificAmerican.com/thoughtful-animal](http://blogs.ScientificAmerican.com/thoughtful-animal)

## MARINE BIOLOGY

**Clever Coral**

Reefs recruit fish  
as bodyguards

Just below the ocean's surface, coral reefs are under constant assault by seaweeds that seek to take control by stealing the corals' prime sunlit location for themselves. Many of these plant invaders come equipped with deadly chemical weapons that knock down the corals' metabolism, which might come off as an unfair fight against a

seemingly unarmed foe. But corals are not defenseless: as a recent paper in *Science* shows, they have fish bodyguards at the ready to mount a defense.

Study co-author Mark Hay, a biology professor at the Georgia Institute of Technology, and his postdoctoral student Danielle Dixon were studying coral-seaweed interactions in Fiji. The scientists noted that when they introduced the toxic seaweed *Chlorodesmis fastigiata* to the reef-building coral *Acropora nasuta*,

small gobies would emerge within seconds from their hiding places to pick at and eat the seaweed.

To really understand what was going on, the scientists took a variety of water samples and exposed the fish to them in the lab. They found that gobies were drawn only to water from corals that had been damaged by seaweed but not to the chemical signature of an alga by itself. "We found that the gobies were being 'called' to the area damaged by the algae and that the 'call' was coming from the damaged

coral, not from the seaweed," Hay says. The gobies are not being entirely selfless. Gobies don't just eat seaweed—they also eat mucus from the coral itself. "The fish are getting a safe place to live and food from the coral," Hay notes. "The coral gets a bodyguard in exchange for a small amount of food. It's kind of like paying taxes in exchange for police protection." —Christie Wilcox

Adapted from *Science Sushi* at [blogs.ScientificAmerican.com/science-sushi](http://blogs.ScientificAmerican.com/science-sushi)