

BIRDS THAT USE TOOLS

THE WOODPECKER FINCH

Camarhynchus pallidus

The Woodpecker Finch is one of the Darwin's Finches of the Galapagos Islands, where it is quite common and occurs widely from sea level to high elevations.

This finch is noted for its ability to use a twig, stick, or cactus spine as a food-gathering tool. The Woodpecker Finch has a relatively short tongue, and has learned to use the twig or spine to dislodge insects and grubs from places in vegetation it cannot reach with its tongue. The tool is manipulated in a leveraging and spearing manner to extricate the prey. The same tool may be carried from tree to tree and may be used many times before it is finally discarded. The bird has been observed shortening the selected stick or spine to make it a more manageable size. A number of sticks or spines may be tried before an appropriate one for a particular use is found.

During the dry season, researchers have noted that Woodpecker Finches use tools for around half their foraging time, and that tools are used to acquire up to 50% of their prey. This means their tool use results in them obtaining even more food by this method than chimpanzees, the most proficient non-human primate tool users.

THE NEW CALEDONIAN CROW

Corvus moneduloides

The New Caledonian Crow is a tool-using species inhabiting New Caledonia and the Loyalty Islands. These crows are one of the few non-primate animals known to invent new tools by modifying existing ones, and then passing the modification to other individuals within their cultural group. They have also been observed making tools, of a kind used in the wild, from materials other than those found in the wild.

The ability to fashion tools had always been held as unique to primates. Thereby distinguishing humans and their closest relatives from (apparently) less intelligent creatures. However, scientist were amazed when footage recorded using tiny "crow-cams" on the tails of New Caledonian crows showed the birds creating advanced implements. One bird was filmed whittling twigs and leaves with its beak to fashion grabbers with which to pick grubs from the ground.

The New Caledonian Crow uses plant material to create hooks or barbs to extract grubs from inside logs and branches. This bird fills in the ecological

niche of the Woodpeckers and the Woodpecker Finch of the Galapagos Islands, as New Caledonia and the Galapagos lack woodpeckers. However, unlike the Woodpecker Finch, it does not simply stab a grub and slowly lever it out of a log or branch with a small twig but pokes the to agitate it into biting the twig.

The New Caledonian Crow is the only recorded non-human species capable of inventing new tools by modifying existing ones, then passing these innovations to other individuals in their cultural group. Gavin R. Hunt and colleagues at the University of Auckland studied the various tools the crows make out of pandanus (or screw pine) leaves:

“Crows snip into the leaf edges and then tear out neat strips of vegetation with which they can probe insect-harboured crevices. These tools have been observed to come in three types: narrow strips, wide strips and multi-stepped strips—which are wide at one end and, via a manufacturing process that involves stepwise snips and tears, become narrow at the opposite end.

The geographical distribution of each tool type on the island suggests a unique origin, rather than multiple independent inventions. This implies that the inventions, which involve a delicate change in the manufacturing process, were being passed from one individual to another.”

The New Caledonian Crow also spontaneously makes tools from materials it does not encounter in the wild, the only non-human species known to do so. In 2002, researcher Kacelnik and colleagues at the University of Oxford observed of a couple of New Caledonian Crows called Betty and Abel:

“Betty's toolmaking abilities came to light by accident during an experiment in which she and Abel had to choose between a hooked and a straight wire for retrieving small pieces of pig heart, their favourite food. When Abel made off with the hooked wire, Betty bent the straight wire into a hook and used the tool to lift a small bucket of food from a vertical pipe. This experiment was the first time the crows had been presented with wire.”¹

This learning ability was subsequently tested through a series of systematic experiments. Out of ten successful retrievals, Betty bent the wire into a hook nine times, and Abel retrieved the food once, without bending the wire. The process would usually start with Betty trying to get the food bucket with the straight wire, but then she would make a hook from it and

¹ Members may remember a video of these birds performing this trick being shown at a General Meeting.

bending it in different ways, usually by snagging one end of the wire under something, and then using the bent hook to haul up the tray.

In 2004, Gavin Hunt observed wild New Caledonian Crows making hooks, but Betty's adaptation to the new material of the wire was clearly both novel and purposeful. This type of intentional tool-making, even if it is generalising a prior experience to a completely new context, is almost unknown in the animal world. Chimpanzees have great difficulty in similar innovative tasks.

New Caledonian Crows have, through experimentation, recently been shown to be able to use one tool to affect another to achieve a task, at a level rivalling the best performances seen in primates.

One such experiment, conducted by the Auckland team, involved putting food in a box out of the birds' reach. They were then given a stick too short to reach the food, but long enough to be used to retrieve a longer stick from another box. The birds then used the longer stick to retrieve the food. This complex behaviour involved the birds' realising that by suppressing the urge to go directly for the food a tool could be used on nonfood objects to facilitate the desired object of food retrieval. This problem was solved by six out of seven birds on the first attempt.

New Caledonian Crows also use tools to investigate potentially dangerous objects.

R.V.C. with help from Wikipedia