

Raging Dove





Bullfinches flit into the kitchen, skipping fearlessly from bread crumb to bread crumb on the table. At a hotel bar, bananaquits perch on a sugar bowl, unperturbed by the sunburned tourists lounging only a few feet away. As the afternoon tea cools in fancy china cups, the bananaquits drink the sweetened liquid: this is, after all, "Little England," one of the nicknames given to the West Indian island of Barbados, where piping-hot tea is served at five, even when the temperature tops eighty degrees.

For bird lovers, Barbados is both the Garden of Eden and one of the most boring tropical islands imaginable, Boring, because the country lacks the luxuriant diversity usually associated with the Tropics. Essentially a tiny, fourteenby-twenty-one-mile stack of coral terraces. Barbados is too flat to harbor rain forests, too porous for streams and swamps, and too far east of the other Caribbean islands for avian migrants to push their way there against the everpresent trade winds. The island has been covered almost coast to coast by sugarcane fields since the 1600s and is inhabited today by some 300,000 people.

The Edenic side of the island lies in the remarkable tameness of the few avian species that have made Barbados

Clockwise from top: Before a fight, Zenaida dowes face off at the border between their territories and threaten each other with naised wings. Fights are usually brief but violent. Often all the observer can make out is a blur of outstretched, flapping wings. During more peaceful moments, the purple neck patch characteristic of the species is visible. Other avian residents of Barbados include the Lesser Antillean builfinch, which like many of the island's birds shows a keen interest in "umatural" human habitats.

their home. Just why they are so tame is unclear. Is it because natural predators were also unsuccessful in making the long journey from the Lesser Antilles and South America? We can't know for sure, but the result is a flurry of wings and hopping feathered bodies an arm's length away from any human handout slipping tea, yes, but also kingbirds zooming down to pick up guppies from an overflowing gutter, grackles noisily scavenging around picnic tables and garbage cans, ground doves skittering over manicured English lawns.

But the most remarkable feathered convert to life around humans is the Zenaida dove (Zenaida aurita). Whether finishing off breakfast toast on a hotel balcony, pacing under tables in a seaside restaurant, searching the streets of Bridgetown for a discarded piece of sandwich, or waiting near a statue in the park for a kindly, elderly lady to offer a morsel of bread, this plump little dove appears at first to behave like any city pi-

The little Zenaida dove of Barbados is tame around humans, but often ferocious with its own kind.

geon in the world. (Both the Zenaida dove and the city, or rock, pigeon—Columbia livia—belong to the family Columbiae.) One key difference, however, separates it from its larger columbid cousins of Trafalgar Square or Piazza San Marco: while hundreds of city pigeons can swarm around a few pieces of bread, walking all over one another with hardly a peck of aggression, the Zenaida dove of Barbados is a ruthless defender of its personal space.

The dove a symbol of peace? Not this one. Spectacular battles sometimes crupt on hotel balconies, on restaurant tables, and at picnic areas year-round, from the parched dry season (December to June)

to the lush rainy season (which peaks in October). Like cocks in a pit, the doves face off at the border of their territories: utter low, wheezing calls; peck furiously at the ground in front of them; and then lunge at one another with outstretched. flapping wings, which collide with the sound of snapping towels in a beach fight. All this generally takes place just a few feet away from the astonished human who happened to throw a piece of bread in the wrong spot-the border between territories that mated pairs of resident doves have been hammering out for years. At the Bellairs Research Institute of McGill University, in Saint James Parish, Barbados, I have watched the same neighbors beat each other up day after day, with the sole territorial gain of six inches over two years.

Watching the battles roused my curiosity about how Zenaida doves learn where and what to eat. Species that have successfully adapted to city life are often good learners; it is no coincidence that pigeons and rats, two of the animals best adapted to cities, are staples of the Skinner boxes in learning laboratories. Rats have complex olfactory mechanisms to transmit information about food to others in the colony. Much learning in pigeons consists of observing other flock members and avoiding the places, food types, and feeding strategies used by too many pigeon competitors.

Unlike the gregarious pigeons, territorial Zenaida doves have little chance to learn from other doves. Our studies have shown that they, too, learn by watching, but the objects of their attention are other species of birds, such as the Carib grackle, with which single or paired Zenaida doves forage peaceably.

Trap a wild Zenaida dove, bring it to the learning laboratory (as my students and I have done with 111 territorial adult males and females over the years), place it with a dove trained, for example, to lift the opaque lid on a dish containing seed, and it will just stand there, pacing nervously, oblivious to information a pigeon would use to open its own food dish. Give the territorial dove a trained grackle as demonstrator, however, and the difference is spectacular. The dove suddenly becomes interested in the feeding apparatus, solves the problem, and gets the energy it needs to reclaim its territory from intruders when we release it, generally two weeks later at the end of the experiment.

For researchers interested in the ecology of learning, Barbados offers a bonus: a small population of Zenaida doves whose behavior differs radically from that of the other doves on the island. Like any temperate-zone port with grain storage facilities, Deep Water Harbour in Bridgetown swarms with columbids flocking down to feed on the pounds and pounds of corn, soybeans, and wheat that get spilled around the warehouses. The difference is that in Barbados the birds are almost all Zenaida doves, perching on warehouse roofs and fluttering down in groups of up to a hundred birds. And here, in contrast to the squabbling we see among Zenaida doves elsewhere in the island, there is very little fighting among flock mates.

What explains their peaceableness? In part, the answer is simply that they use each other to find food. Grackles are few and far between at the harbor, and the best way to locate a spill is often to follow the fluttering mass of dove wings.

And as might be expected, experiments in our laboratory showed that these harbor doves fail to learn foraging tricks from trained grackles but learn rapidly when placed with a trained dove.

Other experiments showed that in the absence of trained demonstrators, harbor doves learn faster than territorial doves presented with the same problem.



The tameness of its birds makes Barbados an Eden for bird lovers and researchers alike.

This may be because a territorial dove's main feeding strategy is not so much to get to food quickly as to keep others away from it, while the goal of a groupforaging bird-competing with a hundred other birds for the same pile of grain—is simply to get to the pile and start eating. The premium is on speed and learning, not fighting.

Several studies have shown that species that differ in feeding ecology also differ in learning ability-and in the brain structure underlying learning. For example, birds that store and later retrieve food, like the black-capped chickadee, have both a better spatial memory and a larger (and seasonally developing) hippocampus (the part of the brain specialized in storing information about landmarks) than do birds that consume their food right away.

Genetic divergence may very well explain such differences at the species level, but the differences between our groupforaging and territorial doves may be more a case of learning to learn, a flexible adjustment to local variation in feeding ecology. A bird growing up on its parents' territory quickly learns the hard way that paying attention to a feeding neighbor brings pecking attacks and wing slaps, but rarely food. Paying attention to grackles, however, may be more rewarding; they are noisy, curious, quick







to try out any new feeding opportunity, and tolerant of others. Growing up at the harbor has very different rewards and punishments. Grackles are less common, while the activity of other doves is pretty good indicator of freshly spilled food. Regular cleanups by harbor employees, however, and competition with

other doves demand speed in foraging.

Support for this idea comes from the territorial Zenaida doves of Brandon Beach, a public recreation area next to Deep Water Harbour. When tested, these birds learn equally well from both doves and grackles. This could be because they have mixed foraging experi-

Patrons of Barbados's many open-air restaurants are likely to be joined by birds looking for a handoud, above. If none is forthcoming, the remarkably tame birds—perhaps a thirsty bananaquit (opposite page, center), grackles vying for crumbs on a table top, or a bullfinch flying in to investigate—may just help themselves. Around the wurehouses of Deep Water Harbour, flocks of Zenaida doves feed peaceably on spilled grain, far left. The doves often find fresh spills by keeping an eye on one another. Elsewhere on Barbados, Zenaida doves tend to be highly territoday, Learning about new food sources more quickly from other species, such as grackles, left, than they do from one another. ence: once in a while some of the Brandon birds fly to feed with the nearby harbor flock; similarly, when a sudden bonanza of food appears at a Brandon picnic table, the territorial resident may be forced to share it with a temporary influx of harbor birds. In any case, individual doves do move back and forth between the harbor and Brandon Beach, making interbreeding likely and genetic divergence unlikely.

Much remains to be learned about the feeding education of a Zenaida dove. But already, the little dove of Barbados has taught us a lot about learning and adaptating to "unnatural," urbanized habitats. And the tameness of the island's birds makes it difficult for the researcher to find anything to complain about; you can sit quietly in the shade of a redflowered flamboyant tree, sipping a local rum punch, with the Zenaida doves and grackles milling around just a few feet away, ready to be trapped, whenever you're rested and feel like getting back to work.

