nunbirds

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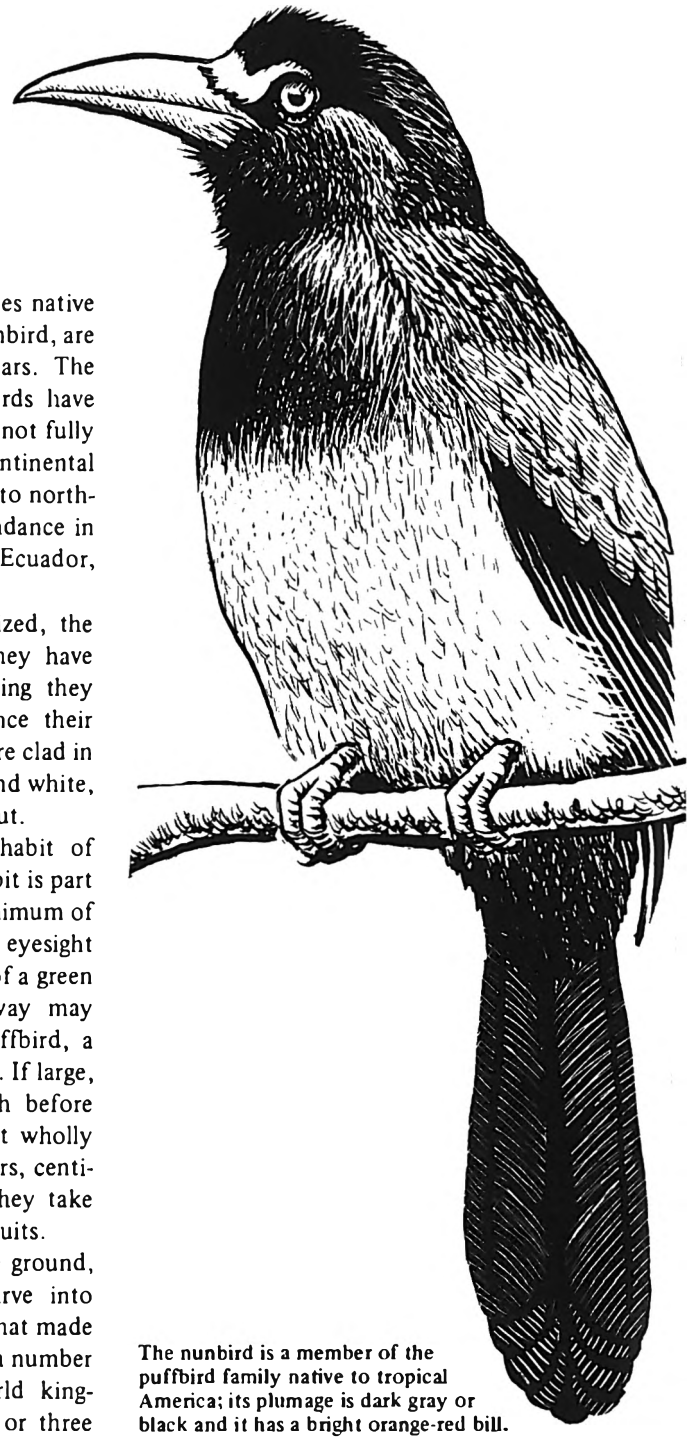

The nunbird is a member of the puffbird family native to tropical America; its plumage is dark gray or black and it has a bright orange-red bill.

The puffbirds, a family of some 30 species native to tropical America and including the nunbird, are related to the woodpeckers and jacamars. The habits of less than a half-dozen puffbirds have been studied in detail, and even these are not fully understood. Puffbirds are confined to continental tropical America, from southern Mexico to northern Argentina, with their center of abundance in the Amazon basin of Brazil, Colombia, Ecuador, and Peru.

The smallest puffbirds are warbler-sized, the largest about as big as a blue jay. They have relatively large heads, and while perching they sometimes puff out their plumage, hence their name. Puffbirds lack brilliant colors and are clad in varying patterns of black, gray, brown, and white, and in some cases, bright rufous or chestnut.

The puffbirds are noted for their habit of perching motionless on branches. This habit is part of a pattern of foraging that entails a minimum of lost motion and wasted energy. Puffbird eyesight is exceedingly keen, and the movement of a green insect amid green foilage 20 yards away may release, in an apparently somnolent puffbird, a sudden swift dart that results in a capture. If large, the victim is pounded against a branch before being swallowed. Puffbirds subsist almost wholly upon insects, with an admixture of spiders, centipedes, and other invertebrates. Rarely they take small frogs and lizards. They seldom eat fruits.

Some puffbirds nest in burrows in the ground, others in cavities which both sexes carve into termitaries still inhabited by the insects that made them – a custom which they share with a number of jacamars, trogons, parrots, Old World kingfishers, and other birds. They lay two or three

white eggs, which are incubated by both sexes.

Of the puffbirds whose habits are fairly well known, the most sociable are the nunbirds of the genus *Monasa.* These rather large puffbirds owe their English name to their plumage of deep gray or black. The bill of a nunbird is not so drab, being bright orange or red. The four species of nunbirds inhabit the heavier forests from Nicaragua to Bolivia and Brazil.

My first meeting with nunbirds was in 1940 on the Rio Yavari, which separates Brazil from Peru. Here the rubber survey party on which I served as botanist went ashore at a tiny settlement which someone with a longing for coldness and a sense of humor had called Islandia (Iceland). While we examined a young rubber tree growing in a plantation near the forest, a small flock of black-fronted nunbirds *(M. nigrifrons)* perched in the branches above us, uttering soft, musical murmurs while they twitched their tails from side to side. This brief encounter convinced me that nunbirds had unusual habits that would well repay study, but nearly 30 years were to pass before I could prove the correctness of my surmise.

Finally, in 1967, my long-standing desire to study nunbirds was realized in the Sarapiqui lowlands of northern Costa Rica, where the white-fronted nunbird *(M. morphoeus)* inhabits the tall, epiphyte-laden rain forests. The bird's deep gray and black plumage is relieved by short, stiff, outstanding white feathers on the forehead and chin, from the midst of which its orange-red bill springs. Its large, soft eyes are brown.

In early April 1967, Dr. Dennis Paulson, who was in the Sarapiqui region studying dragonflies, brought the good news that he had found a nunbird nest. He had seen three nunbirds with food in their bills fly across the swamp from the nearby cacao plantation and, following them, had discovered their burrow in a forested hillside.

It was then late in the afternoon, and we delayed visiting the nest until the rain that was falling the next morning had stopped. As we approached the nest site through the dim, dripping forest, we saw a large mound of freshly dug earth in front of a yawning hole. Some animal had utterly ruined our chance to examine what was apparently the first nest of the white-fronted nunbird ever to be found by a naturalist. For the next two months, we searched fruitlessly for another nunbird nest.

Early in the following April, an assistant and I discovered three occupied burrows. All were in heavy forest, amid the undergrowth of low palms, ferns, shrubs, and woody vines. From the opening in a moderate slope or nearly level ground, the tunnels descended into the earth with a slight inclination. The shortest tunnel was only 40 inches long and so straight that, with the aid of a flashlight, we could see right to the end. The other two were 55 inches long and slightly curved, so that it was not possible to see the far end and learn exactly what the tunnels contained. A thorough examination of the long burrows would have required excavation, which would have jeopardized our studies.

Around the mouth of each burrow the nunbirds had placed a collar of dead leaves, sticks, and other trash. This collar was thickest at the burrow in the most level ground, where it helped to conceal the elongated opening of the tunnel.

Soon after discovery each of our three burrows held nestlings. In the shortest burrow there were three young birds still blind and quite naked, with no down on their pink skin. They rested on a bed of brown, fragmented dead leaves, which lined the enlarged chamber at the far end of the burrow. With admirable devotion, the parent who brooded the young stuck to its post while we looked in with a flashlight, made notes, and even inserted a ruler to measure the length of the tunnel.

We were led to the discovery of these burrows by hearing the rippling, trilling, or purring call by which the nestlings' attendants announce their arrival with food. Often they repeat the call for two or three minutes, and much longer if they are distrustful, before they descend to the burrow's mouth. Searching for the inconspicuous burrow openings during incubation, when the parents probably sit still for hours at a stretch, is like looking for the proverbial needle in a haystack. Although I have watched several kinds of puffbirds excavate their nest chambers in termitaries, how and when the ground-nesting species prepare their burrows remain a mystery. Perhaps, like certain motmots, they dig them half a year before they lay their eggs in them.

In striking contrast to the excessive wariness shown by many tropical forest birds while attending their nests, the nunbirds were amazingly fearless in our presence. Although there were considerable individual differences, some birds would descend to the burrow's mouth while we stood, unconcealed, only five to ten yards away.

Feeding of the nestlings was a most interesting performance. Each adult brought no more than a single item of food at a time, usually an insect (often a cicada). The bird held the prey in the tip of its orange-red bill. After repeating the undulatory approach call a variable number of times, the

The white-fronted nunbird inhabits the tall epiphyte-laden rain forest of the Sarapiqui lowlands of northern Costa Rica.

The mouth of the nunbirds' burrow is surrounded by collar of dead leaves and sticks to conceal the opening the tunnel.

adult flew to the burrow's mouth and stood there on the ground, silently waiting for a nestling to come and take the food. If a nestling did not soon appear, the adult began to call, the notes growing louder the longer it had to wait, until they became a sharp *click click click* . . .

Only if it intended to brood, which was seldom, did a parent carry food inside the burrow. Even the youngest nestlings that we found, at most a few days old, took their meals at the doorway. Looking past the adult standing in front of the opening, we could see the little pink nestling come toddling down the tunnel, bobbing its sightless head and waving its rudimentary wings. After seizing the prey, it backed out of sight into the darkness of the burrow. In the longer burrows, the round trip between the chamber and the doorway was eight or nine feet.

This method of taking meals, which is practiced also by white-whiskered puffbirds, continued as long as the young remained in the burrow. Older nestlings, when very hungry, sometimes called *tuwee tuwee* as they approached the adult that offered the meal. Two nestlings rarely came simultaneously for food. It was even more rare to see two adults together at the burrow's mouth. After each adult delivered the meal, it promptly flew into the trees.

At each of the three nests we studied, three or four adults brought food. Apparently one, two, or more non-breeding birds assist in the parental offices. The helpers are probably yearlings who would not mature sexually until a subsequent breeding season. In many instances, no doubt, the extra birds were older brothers and sisters of the nestlings they attended. Such yearling helpers are known to occur in certain species of wrens, jays, and other families. At one burrow three attendants could be distinguished individually by broken or frayed tail feathers. However, we very frequently had three food-bearing adults in view at the same time, and occasionally four came in such close succession that we were fairly certain that none had repeated. About the time nesting began, or a

member of a family group, doubtless the laying female, was liberally fed by several companions.

The three nestlings in the only burrow where we could see the whole brood at once were the same age and seemed to be the offspring of one female. Accordingly, we dismissed the idea that the nunbirds nested communally with several females laying their eggs together.

In contrast to certain other puffbirds, whose weak voices are seldom noticed, nunbirds have such a variety of calls that, whenever in the forests of Sarapiqui I heard a loud, unfamiliar bird note, I was inclined to attribute it to them. Often I proved to be right. Loudest and most surprising of their vocal performances is the chorus, which we heard from late March into June, but most frequently from mid-April to late May. Then the family groups attend more mature nestlings or fledglings already on the wing.

To deliver a chorus, the three or four adults of a family, or sometimes as many as eight or ten grown birds, would gather in a compact group well up in the forest, more rarely in a tree in an adjoining clearing. They would perch a few inches apart, often in a row on a slender horizontal branch or a vine stretched between two trees. The dusky participants would tilt their heads upward and cry together in loud, ringing, almost soprano tones, with so much gusto that their whole bodies shook. The chorus swelled or waned, as birds joined in or stopped singing, but for 15 or 20 minutes there would be only brief intervals of silence.

No other bird that I know performs in a similar manner. We heard these unique choruses chiefly around midday. The function of these social exercises is not clear, but they seem to strengthen the bond between the several members of a family group, much as in many species of tropical birds duetting or antiphonal singing helps to bind together the members of a constantly mated pair.

Once a chorister held an insect in its bill. At the conclusion of the performance it flew off toward a nearby nest, followed in single file by the three other attendants of the nestlings – an impressive sight. At times, when eight or more nunbirds perform together, the chorus may help to define their territorial boundaries, or it may be just a friendly gathering of neighbors. I never saw a nunbird display hostility.

Unlike nestling jacamars, which often sing in their burrows, the young nunbirds remained quietly out of sight in their subterranean nursery, and we rarely heard or saw them except momentarily, when one came to the entrance for a meal.

Once, however, I happened to be looking into the shortest burrow when an attendant alighted close behind me, giving the approach call. Although nestlings do not ordinarily respond to this call, on this occasion they must have been very hungry, for they started to run up the tunnel toward the doorway, and I easily caught the one which arrived there first. Its plumage was just expanding. I noticed that its heel joints were coverd by callose pads, which were smooth rather than spiked as in nestlings that grow up in holes in trees and termitaries. These pads protect the heels, which bear much of the nestling's weight, from abrasion against the unlined or poorly lined floor of the brood chamber. When I replaced the young nunbird, it promptly ran down to join its siblings at the inner end of the burrow.

A few days later, this short burrow was dug out by some powerful animal, possibly a tayra. While I stood contemplating the melancholy spectacle of the ruined nest, the four attendants arrived with food in their bills. One by one, they stood on the mound of freshly dug earth in front of the pit where their burrow had been and called the lost nestlings. Low at first, their notes rose to almost frenetic intensity as they were repeated over and over without a response. For at least 24 hours after the nestlings were taken, some of the attendants brought food for them.

In a longer burrow, the nestlings remained for about a month. Emerging from their subterranean abode, they promptly rose high into the great forest trees, where it was difficult to see them. Their bills were pale rather than orange-red, their foreheads and chins orange-buffy instead of white, and their body plumage darker than that of adults.

After the juveniles were older and could fly well, their parents sometimes led them into the shade trees of the cacao plantations and other clearings,where we could watch them being fed. After catching an insect or some other small creature, and perhaps beating it against a branch, the adult would not pass it to a juvenile, as many birds do. On the contrary, the attendant continued to perch, holding the food conspicuously, while the youngster flew up, and without alighting snatched the article from the adult's bill. Birds with such well-controlled flight seemed quite capable of foraging for themselves, but perhaps they still had difficulty recognizing appropriate food. This spectacular method of taking their meals provides excellent practice in the mode of foraging typical of puffbirds, which combines motionless perching, sharp-eyed scrutiny, and sudden bursts of highly effective activity.