

Red-throated Caracara—

## THE SCOURGE OF THE WASPS

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**One of the mysteries of the feeding habits of the Red-throated Caracara is why it is not unbearably stung on the bare skin around its head when it attacks a nest of the "guitarron" wasps. It seems to disregard the wasps that buzz around.**

*Drawings by Lloyd Sandford*

**C**acáo ca ca ca ca cacáo sounded loudly far above me as I wandered through primeval forest in the middle of the Isthmus of Panama. My head far back, I peered into the crowns of the majestic trees until I caught sight of the author of these alarming cries, resting high up on a leafless bough. It was a large, long-tailed, hawk-like bird, nearly everywhere black with a blue-green gloss, except its snowy white abdomen and under tail-coverts. In contrast to the plainness of its plumage, its featherless parts were vividly colored: its naked cheeks were deep crimson, its bare throat red, its bill yellow with leaden blue cere, its legs bright orange-red. From the description I then wrote, I identified this bizarre bird as *Daptrius americanus*, the Red-throated Caracara, a peculiar member of the falcon family.

While I watched, the caracara changed to a different call, no less raucous than that which

had first arrested my attention. Its cries now reminded me of the loud, harsh, forced laughter of a boorish person in a derisive mood. It repeated this rude *ha ha ha* over and over, all the while holding in its bill something which resembled a fragment of brood-comb from a wasps' nest. After I had examined it carefully through my binoculars, the noisy bird flew off over the tree-tops and vanished, but I continued to hear the raucous cries that had at first startled me.

The following year, when I dwelt in a narrow valley amid the high mountains of southern Costa Rica, I learned from the country people to call this hawk the "cacáo"—an excellent rendering of its loud call. At the beginning of the dry season in December and January, when evidently they were forming pairs and preparing to nest, these birds were especially noisy, frequently shouting raucously from the tree-tops. In January, I watched a lone cacáo who perched on a

dead branch, as usual high above the ground, and acted in a ludicrous fashion, flapping its black wings loosely about its body as it uttered a variety of unmelodious cries. During the remainder of the year the caracaras were less noisy and conspicuous, but they always drew attention as with labored wingbeats they flew high above the valley from forested ridge to forested ridge, calling *ca ca ca cacáo* as they went. Often three travelled together, but I have never seen caracaras in larger flocks.

Another remarkable creature with which I became familiar in southern Costa Rica was a large, blackish wasp, which attached its conspicuous nests to the trunks and thicker branches of trees and not infrequently to the walls of houses. These vespiaries, sometimes reaching four or five feet in length, are enclosed by a stout envelope of gray or brownish carton, strengthened by pronounced transverse corrugations. The wasp, a species of *Synoeca*, was well known to my neighbors, who called it the "guitarrón," probably because the cross-markings in the walls of its nest reminded them of the fretted handle of a guitar.

The guitarrón wasps won my admiration and respect one year when they shared the rough, unpainted cabin which I rented in the Valley of El General as a base for my field work. Early in February, a swarm of them settled down and proceeded to build on one of the pillars that upheld the tiled roof at a corner of the little front porch. When neighbors warned us that these wasps have a most painful sting, my companion, a young entomologist, advocated that we follow their advice and smoke them out. But I argued in their favor, pointing out that it would be interesting to follow the construction of the nest. We finally agreed to permit them to remain as long as they preserved the peace.

They built their hexagonal brood cells in a single layer, securely attached to the surface of the wooden post, and at the same time they set about constructing the envelope to enclose them. For building material they tore fine fragments from decaying or even sound wood, making considerable noise as they attacked the edges of softwood boards with their strong mandibles, and they somehow cemented these bits together, possibly with a secretion from their mouth parts. Beginning at diagonally opposite corners of the

square pillar, they at first built the corrugated walls outward, but soon they made them curve inward, until the edges of the two sheets of carton approached each other above the center of the nest. It seemed to me that even a man, given ruler, calipers and other measuring devices, would have difficulty in bringing the two sides together while preserving the smooth sweep of the original curves, but without any aids of this sort the wasps accomplished this perfectly, finally cementing the two sheets tightly together along the middle line, about ten days after they began to work.

After the envelope was completed, the only entrance to the vespiary was through a round opening, about an inch in diameter, at the end of a short spout at the top of the nest. If the community prospers and grows, the guitarrón wasps enlarge their nest by building at the top a similar section, the lower end of which overlaps the doorway of the older part, and such additions may be made repeatedly. The enclosed portion of the next older segment is then removed, with the result that the nest always consists of a single elongated space containing a continuous sheet of brood cells and entered through a single aperture at the upper end. But irregularities in the outer wall enable one to count how many times the structure has been enlarged.

The wasps on our porch never stung us, thanks largely to the signals which gave us ample warning that we were annoying them. If we engaged in some noisy occupation close by, or experimentally struck the supporting post, those within the nest produced a loud rustle by vibrating their wings and perhaps also by striking them against the enclosing carton, which acted as a resonance box to intensify the sound. If the disturbance





*It was on a Spanish plum tree at the edge of this forest in the Valley of El General in Costa Rica that the author first saw a Red-throated Caracara tearing holes in the wasp's nest and eating larvae.*

*Photo by the author*

were continued, they sallied forth to defend their citadel with long stings barbed like those of the honey bee — a formidable weapon such as few wasps possess. Even at dawn, when after a clear night in February they were too cold to fly, our wasps whirred their wings threateningly and came pouring out if their nest were molested. But they could then only crawl stiffly over the outside, and those that attempted to fly beat their wings so slowly that they fell ignominiously to the ground, where they lay helpless until after sunrise, when rising temperature made them more active. Thus we and our guests preserved a sort of armed neutrality over a period of nearly five months.

It requires years of patient observations to become familiar with a few of the multitudinous creatures of the tropics, and even more slowly does one discover some of the interactions between them. The scene again shifts to the fourth of my abodes in the Valley of El General, the farm where I have dwelt for the last eighteen years. When I settled here, there was a large

nest of the guitarrón wasps attached to the lower side of a thick, ascending branch of a Spanish plum tree that grew near the forest's edge, not far from the house I was building. One afternoon in November, loud, hoarse, raucous cries drew my attention to a caracara standing on the base of the branch that supported the vespiary. The bird had somehow made two small punctures in the carton wall, and while it rested there the big, angry wasps swarmed around it. Some apparently attached themselves to its plumage, for it shook its head, scratched its body with a foot and seemed to pluck one or two from its feathers. But on the whole it did not appear to take much account of the insects. It was clear that its chief problem was to make a breach in the citadel's wall, not to avoid the attacks of its defenders. When the big bird bent far over the side of the stout branch to peck at the side of the wasps' nest, it would slip down and regain its balance with difficulty. But finally it succeeded in making the holes large enough for its purpose.

Now, clinging back downward below the wasps' nest with its toes in the perforations it had made, the caracara began to tear large, papery flakes from the upper part of the corrugated envelope of the hive. Soon its head was inside, hidden from my view, but I had no doubt that it was enjoying a feast of tender white larvae and pupae. White belly upward, tail half spread, wings partly open and hanging in random attitudes, the caracara reminded me of a dead hawk hung up by a gamekeeper to frighten away others of its kind. It kept the merest toe-hold on the edges of the perforations in the side of the nest's envelope, and I was amazed that carton so thin could sustain in this fashion a bird so large and heavy. From time to time the caracara would shift its position, tear away more of the nest's covering, always working downward, then again bury its head in the interior, to proceed with the feast. I now judged that I could advance closer without risking the interruption of the process

that I was eager to study. Through my binoculars, I could clearly see the big wasps hovering around the despoiler of their home, but they preserved a slight distance from it and none alighted on its glossy, blue-black plumage. Many were already settling down on the surrounding foliage.

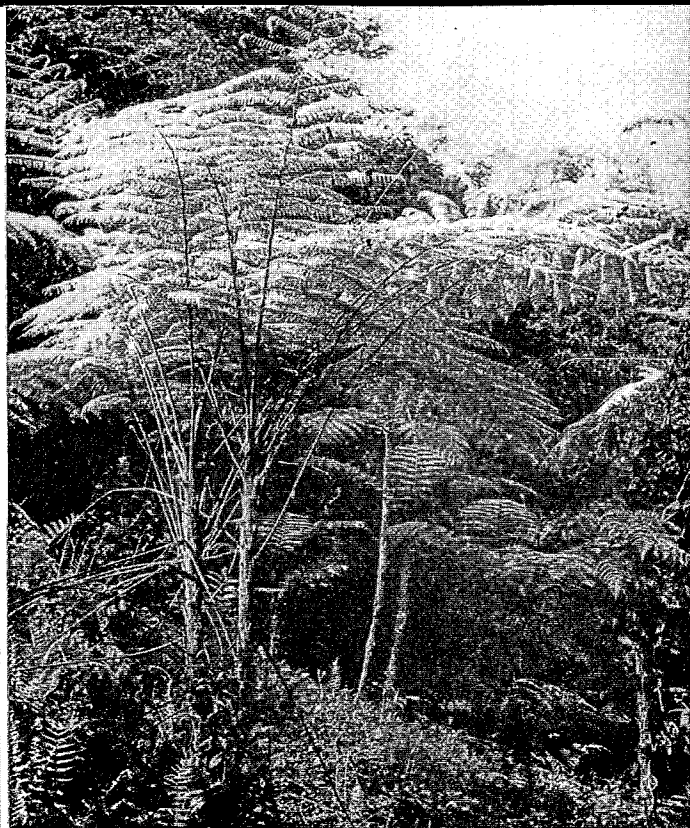
When, proceeding in this fashion, the caracara reached the bottom of the nest, it experienced greater difficulty. Its foot-hold gave way and it fluttered down into the bushes on the slope below the Spanish plum tree. Then it flew off to perch in a tree in the neighboring pasture, but after a brief rest it returned to the attack, uttering its raucous war-cry. Again its footing failed before the meal was well resumed; it fluttered down, flew off to perch and rest, then promptly, with renewed shouts, returned to the vespiary — with precisely the same result as before. Seven times the caracara attempted to cling to the nest, only to have its toe-hold promptly break away. Apparently this lowest part of the corrugated envelope, being oldest, was not as tough as the newer portions toward the top. At last becoming

discouraged, the noisy bird flew to the tall trees beside the river, to rest and digest its meal.

It had left very little that was edible in the vespiary. All the brood cells, save a few in the lowest part of the nest, were open and empty. A whole city of wasps had been destroyed to supply one meal for a caracara! The insects still crawled dispiritedly over their pillaged domicile, but I had little doubt that, like the companions of Aeneas after the sack of Troy, they would re-establish their city in a new site.

The black swarm migrated only about fifty yards to the front wall of my house, where they added another type of structure to the fascinating variety of wasps' nests that already made the walls and rafters of my recently built home interesting to a naturalist. Some of these vespiaries were from time to time torn open for their larvae and pupae by wintering Summer Tanagers from the North, who plied the same trade as the caracaras but on a more modest scale. I never saw one of these shy red visitors molest a nest of the guitarrón wasps. But the latter were not immune from the attacks of the army ants which periodically swarmed over and through the house, driving most of the smaller wasps from their nests, and carrying the white grubs down the walls and out across the dooryard in their endless streams of hurrying marauders. When the *Eciton* ants attacked the guitarróns' nest by day, the big, black wasps lined up inside their doorway, with heads just visible in the aperture, and pushed back the attackers, without — so far as I could see — the infliction of injury by either party. When the ants succeeded in opening a small breach in the carton, the wasps defended the gap in the same way.

But by night the diurnal wasps were no longer a match for the sightless ants, which work equally well in light or darkness. One night the guitarróns flying in to my lamp apprised me that something had gone amiss with their nest, and going out with an electric torch I saw that the army ants had invaded the vespiary. For hours thereafter they filed down the outer wall of my dining room bearing heavy white burdens — the same food that the caracaras preferred. Even many of the adult wasps were trapped by this nocturnal raid and carried out by as many ants as could take hold of them, marching at a snail's pace.



bird with its foreparts in the vespiary was taking punishment as the price of a meal, the other had no motive to remain so near the angry swarm. The fact that it stayed there was rather convincing evidence that the insects were not hurting it.

A little later, two of the caracaras were at the wasps' nest, while the third waited close by. These social birds share their feasts. The garrulity of the caracaras and other hawks which do not prey on birds, including the Laughing Falcon which subsists largely on snakes, and the Large-billed Hawk that catches lizards, contrasts

**Tree ferns at the edge of the rain forest in Costa Rica. It was near here that the author made many of his observations.**

*Photo by Don R. Eckelberry*

**Mr. Skutch (left) is an authority on Costa Rican birds. With him at the Skutch home is Don Eckelberry, the animal artist.**

*Photo by Mrs. Skutch*

After the ants had withdrawn with their spoils, the surviving wasps returned and replenished their empty cells with a new brood.

Although I found a number of nests of the guitarrón wasps which had been torn open, apparently by caracaras in the manner I had witnessed, eight years passed before I again saw the avian plunderers in action. Walking through a pasture one afternoon in early December, I found three of the noisy birds in a Spanish plum tree that supported a very large nest of these wasps. As I came into view, two of the caracaras flew into a neighboring grove but one continued to tear open the corrugated covering of the vespiary. Soon another returned and perched a few feet from the nest and its feasting companion. The spectator raised a great outcry, calling *cacáo c' c' c' cacáo cacáo* . . . as it loosely shook its wings in ludicrous fashion, and meanwhile the third member of the party was equally vocal within the grove of trees. A swarm of enraged wasps buzzed around both of the caracaras in the Spanish plum, but the birds took little notice of the insects, which would have stung a man beyond endurance. From time to time the resting caracara scratched its head, possibly to dislodge a wasp that I could not see. Although conceivably the

strongly with the dour silence of those fiercer hawks which strike down other feathered creatures.

When we see an animal preying on some powerful creature or one with formidable weapons, as the caracaras on wasps and the Laughing Falcon on serpents (and sometimes venomous ones), we are at first amazed by their temerity and the risk they incur. A little reflection, however, makes it clear that the risk must be exceedingly slight. Since most animals eat at least once daily, if these predators were seriously injured by their particular prey as often as once, on the average, in every hundred encounters, few would survive to reproduce their kind. They are of necessity specialists so well equipped for their hereditary mode of life that they run scarcely any risk — although even in the safest occupations of free animals, no less than of men, accidents sometimes occur, as when an Osprey sinks its talons deeply into a fish large enough to pull it beneath the surface and drown it.

No less surprising to me than the caracara's boldness in attacking the guitarrón wasps was the failure of the latter to put up a more effective defense of their home and immature offspring. Certainly only a pusillanimous creature refuses to

employ powerful weapons to protect its young. But the wasps' apparent cowardice is the counterpart of the caracara's assurance in plundering their nest. If the bird were not master of the situation, it could not afford to take the risk of molesting the vespiary; because the bird is clearly master, the best defense that the insects could make would be ineffective. Since they will inevitably lose their larvae and pupae, it is to the advantage of the species that the adults refrain from futile attacks and preserve their lives to rear another brood.

We do not know the stages by which the ancestral caracaras developed their peculiar mode of life and acquired their apparent immunity from the stings of wasps. Doubtless there was a time when to molest the hive of the larger stinging hymenoptera was for a caracara a precarious

mode of foraging and the insects' attacks less often availed to save their nests, those which desisted from stinging the bird survived to reproduce their kind, those which foolishly strove to defend their brood were exterminated. Natural selection set a limit to their parental devotion; and this process was probably accelerated by the circumstance, noticed by Phil Rau, that the barbed stings of guitarrón wasps become so firmly embedded in the victim that the insects cannot release themselves without tearing away part of their viscera. At the present time, the wasps' attacks are effective against occasional disturbers of their nests, not against professional plunderers like the caracaras. And since animals in their hereditary environment do not, unless at times of dire need, try to procure food by perilous means, it seems likely that the guitarrón wasps rarely employ their powerful stings, except now and then to send off some blundering animal which has no intention to harm them, but fails to heed the insects' warning whirr.

After I had watched the caracaras pillaging the nests of the wasp most dreaded by man in this region, to find them preying on the far smaller potter wasps was an anticlimax. These little wasps covered with black and yellow bands attach their curious nests to slender twigs of trees in dooryards, orchards, shady pastures and other places outside the forest. Roughly the shape of a pear, brownish in color and rarely as much as nine inches in length, these structures are enclosed in a thin envelope of clay so treated that it does not dissolve beneath the heaviest rains. The narrow round opening, at one side of the bottom, is always guarded by a number of striped heads looking out. In plundering these vespiaries, the caracara follows a procedure which would hardly be applicable to a guitarrón's nest. After tearing off the clay bottom of the urn, it detaches one of the flat combs which the *Polybia* wasps build, layer above layer, in its interior. Carrying the comb up to some high branch, the bird holds it down with a foot while with its bill it pulls the structure apart and extracts the larvae or pupae.

I have not succeeded in learning anything about the breeding of the Red-throated Caracara. Apparently it nests high up in the great trees of the tropical rain-forest, which guards its secrets no less stubbornly than the depths of the ocean.



undertaking, possibly to be done only under the stress of hunger in times of scarcity. At this stage the wasps might often have put up an effective defense. But as with the passage of the generations the caracaras became better adapted to this