



N EARLY HALF A CENTURY ago, when northern Guatemala was still a remote region with scarcely any highways, I struggled across an abrupt, forested mountain called Cerro Putul, leading my horse because the steep, narrow trail, strewn with rocks where not deep in mud, was too rough for riding. As I descended through tall, broad-leaved forest where slate-colored solitaires sang enchantingly, a large bird shot out from treetops high above me and flew across the deep ravine below the trail, to disappear in the leafy crowns of trees on the farther side. His pigeon-sized body appeared black against the sky; his abdomen was deep crimson; the

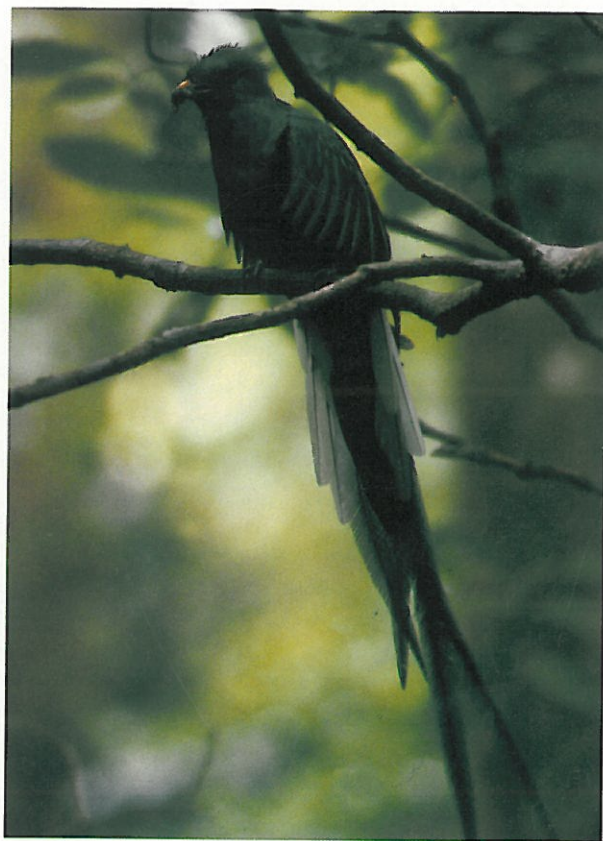
underside of his tail was white; and behind him two yard-long plumes rippled like slender pennants in the rhythm of his undulating flight.

Before the surprise and delight of this unexpected encounter had faded, a second bird, equally splendid, followed the first across the ravine. Instead of diving into the foliage, he obligingly alighted on an exposed branch, where, through my binoculars, I enjoyed a fleeting glimpse of his crested head and wonderfully iridescent green plumage. My first view of a living quetzal, the most spectacular member of the beautiful trogon family, by general acclaim the most gorgeous bird in the Western Hemisphere,

and certainly one of the most elegant in the whole world!

Before this meeting with quetzals in the northern part of the Department of El Quiché, I had already spent two years in Guatemala, much of the time in the highlands, to which these birds are restricted. During these years I had averted my eyes from many a stuffed skin in homes and shops—this was not the way I wished to see quetzals. The abundance of these lifeless specimens, along with the extensive destruction of the highland forests, helped me to understand why it had taken me so long to see a living quetzal. At the date of my sojourn, during President Jorge Ubico's ad-





## Resplendent Myth

*In the cloud forest of the Cordillera Central, ever bathed in mist, a legendary ornithologist came to know the legendary quetzal, by general acclaim the most gorgeous bird in the Western Hemisphere.*

*article by ALEXANDER F. SKUTCH  
photography by TOM BLAGDEN JR.*

ministration, Guatemala's national bird was protected by laws that were apparently well enforced; but, as too often happens, the species was not given legal protection until hunters seeking its glittering plumage had made it rare.

In addition to stuffed quetzals, I saw countless images of the graceful birds: on the medallion in the center of Guatemala's blue-and-white flag, on its postage stamps, on the walls of its public buildings, and, in more stylized form, on the lovely fabrics woven by Indian women and in textile factories. Guatemala has chosen as its national emblem a beautiful, peaceful creature that not only contrasts refreshingly with the

fiercely predatory animals and fire-breathing monsters that other countries have selected to symbolize their national spirit but, moreover, lends itself exceptionally well to decorative design; and Guatemalan decorators have made good use of it. Guatemala has named its monetary unit for its national bird. On my travels about the country, I had carried many monetary quetzals in my pocket, to pay hotels, fares, and porters, before I set eyes upon a living quetzal. Some of these quetzals were spent in Quezaltenango—the "place of quetzals"—the attractively quaint metropolis of the western highlands. But I failed to see a single flying quetzal in the neighbor-

hood of Guatemala's second largest city.

Before Europeans arrived, the quetzal figured prominently in the myths, symbolism, and decorations of the Indians. The great god Quetzalcoatl, rain deity of the Toltecs, is an intriguing image. On his back waved long plumes from the quetzal's train; in his hand he bore a peculiarly shaped staff, sometimes in the shape of a serpent; and his name is often translated as "Feathered Serpent," although more literally it is "Quetzal Serpent." In all nature no strife is more widespread and relentless than that between birds, many of the larger of which eat snakes, and snakes, the chief predators on the eggs and nestlings of birds.





"The forests in which quetzals dwell are watered by abundant rainfall and at all seasons are bathed in cloud-mist much of the time. The constant moisture favors the development of an epiphytic vegetation whose luxuriance is hardly imaginable by those who know only the woods of the North Temperate Zone.

Each larger tree upholds a mass of encumbering vegetation which must be estimated, not in pounds or in hundred-weights, but in tons." These photographs were made in Costa Rica's Monteverde Cloud Forest Preserve on the west slope of the Cordillera Central.

Why this union of creatures so antagonistic as bird and serpent—as though one were to make a single deity of God and Satan? Could it be that, as the prophetic vision of Isaiah saw the lamb dwelling safely with its enemy the wolf and the baby playing unharmed on the asp's hole, the old Toltecs symbolized by this puzzling combination an end of the strife of nature and the peaceful co-existence of all creatures? In any case, Quetzalcoatl, who gave the people maize, was a god of peace and plenty. Until his expulsion by the warlike Aztec deity Tezcatlipoca, the ancient inhabitants of the Mexican plateau enjoyed a golden age worthy of the pacific quetzal.

The quetzal plumes that reached Montezuma's capital, now the site of Mexico City, must have come from the southern parts of his dominions, for in Mexico the bird is now found only in the states of Oaxaca and, chiefly, Chiapas. The use of these plumes was restricted to royalty and nobility, who wore them in elaborate headdresses, as one can see on pre-Columbian carvings and representations of ancient scenes by

modern artists.

Male quetzals, who alone produce these long plumes, are said to have been caught, deprived of their coveted feathers, then released to grow new ones. Thus, the aborigines showed more concern for conservation than did the conquerors, who before long began to exploit the quetzal mercilessly. Apparently because it had already become so rare as to be regarded as mythical, this bird was neglected by Linnaeus when, in the mid-eighteenth century, he gave scientific names to the plants and animals known to him. It did not receive such a name until the year 1825 when Temminck published a painting of it with the designation *Trogon pavoninus*. Seven years later, the French ornithologist De la Llave gave it the name by which it is now known, *Pharomacrus mocinno*. The publicity that the quetzal received by scientific recognition did no good, for museums and private collectors now desired this spectacular bird for their exhibits and cabinets. To meet the demand, hunters ransacked remote mountain forests, especially in the





Verapaz of Guatemala, sending to Europe a stream of dry "skins" that further depleted the remaining populations of living quetzals.

While I traveled about their country, Guatemalans proudly told me that their national bird, symbol of liberty as well as peace, invariably wasted away when deprived of its freedom. The myth was too beautiful to be shattered; but, unfortunately, quetzals died in captivity only because they were not properly nourished. With greater knowledge of the bird's nutritional needs, modern zoological gardens exhibit them for long periods, far from their native forests.

AS OFTEN AS Guatemalans told me that the quetzal would not live in captivity, they volunteered the information that it nested in a hole in a trunk, with two openings, so that the male, who helped to incubate the eggs, could enter by one doorway and, when his turn of sitting ended, leave by the other, without turning around in the cavity, to the detriment of his plumes.

On the other hand, the only account of the quetzal's nesting by an ornithologist that I could find told of a nest in what appeared to be an old woodpecker hole. It had a single entrance, and its discoverer, Osbert Salvin (1861), opined that only the female incubated. To further complicate the picture, a Costa Rican *campesino* said that the male sits in the nest, presumably with head inward, with his long plumes projecting through the single doorway. Accordingly, when I left Guatemala in 1935, much myth and misinformation had gathered around the famous quetzal, but scarcely any accurate data was available.

The object of my study is now known as the resplendent quetzal, to distinguish it from the four related species, beautiful birds but less magnificent, that inhabit South America. From southern Mexico, the resplendent quetzal ranges through the mountains to western Panama. Altitudinally, it is found from about 4,000 to 10,000 feet. Like many highland birds with this distribution, the populations separated by the belt of lowlands across southern Nicaragua and northern Costa

Rica have, over the ages, diverged so much that they are now considered to be different races or subspecies. The quetzals to the south of the Nicaraguan Gap differ from the northern race chiefly in that the plumes of the male's train are substantially shorter and narrower. Nevertheless, they are hardly less lovely than their northern cousins. Not only do the Costa Rican quetzals continue to be more abundant than their relatives in Guatemala, but their prospects of survival are better, for they are protected in national parks and reservations that preserve much mid-level and high-altitude forest, especially Chirripó National Park in the Cordillera de Talamanca.

The forests in which quetzals dwell are composed of crowded lofty trees, those that form a canopy ranging from 100 to 150 feet or more in height. Oaks and alders are abundant in places, but more important for the quetzals are the numerous members of the laurel family, whose exceptionally nourishing fruits enter largely into their diet. These forests are watered by abundant rainfall,



and at all seasons they are bathed in cloud-mist much of the time. The constant moisture favors the development of an epiphytic vegetation whose luxuriance is hardly imaginable by those who know only the woods of the North Temperate Zone, or even those of the lowland tropics. Each larger tree upholds a mass of encumbering vegetation which must be estimated, not in pounds or in hundredweights, but in tons.

Montane forest of this type appears indispensable to the quetzal. While it often ventures beyond the forest to forage and nest in adjacent clearings with scattered trees, it is absent from areas where all the heavy woodland has been shorn. The almost total destruction of the original forest over the central valley of Costa Rica, and nearly all the *altos* or central highlands of Guatemala, no less than direct persecution by man, is responsible for the disappearance of the quetzal from these regions.

By 1937, when I was living in Costa Rica, forests still covered most of the country, but they could be reached only by trails that much of the time were forbiddingly muddy. To find a place to live in or near them, and study the quetzal, was far from easy. After much searching, I had the good fortune to rent an unexpectedly comfortable little cottage that stood on a ridge overlooking a vast expanse of primeval forest, at Montaña Azul, on the northern slope of the Cordillera Central, between active Volcán Poás and quiescent Barba, at an altitude of about 5,500 feet.

In the year that I dwelt there, not only did I learn much about the quetzal and other birds of the mountain forests, but, equally important for a proper understanding of their lives, I felt in my own flesh the climate in which they lived. Through much of the year, the northeast trade winds, sweeping in from the Caribbean Sea across the forested lowlands to the north, drove the clouds over our mountain, for weeks together obscuring the sun and bathing everything in a cold mist. Although at this altitude frost did not form, the saturated atmosphere was so penetratingly chilly that I repeatedly consulted the thermometer to convince myself that the temperature was well above the freezing point. During the stormy months late in the year, when I rarely saw a quetzal, it was difficult to avoid depression and preserve hope that in due course I would



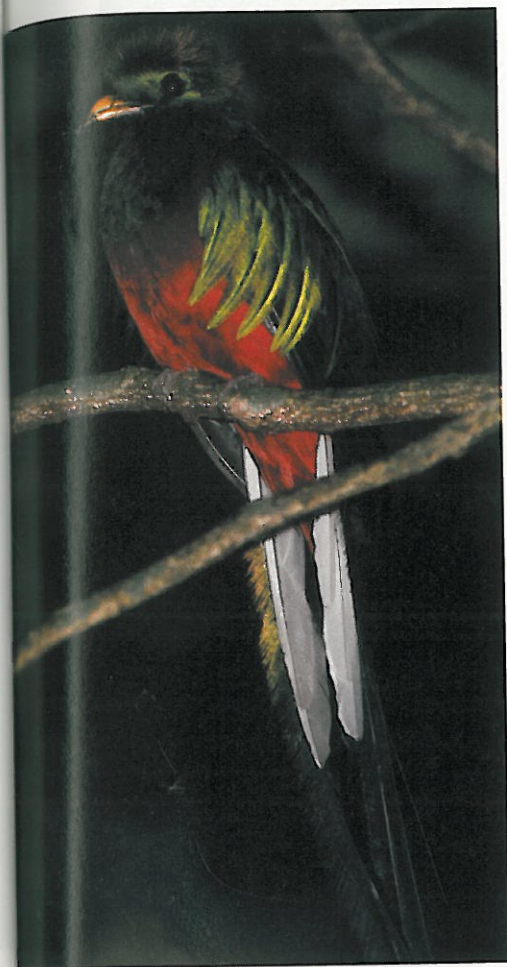
*The female quetzal, "far less beautiful than her exquisite mate."*

find them nesting. But when at last the welcome sun rose into the bluest of skies, illuminating the bright colors of a stupendous wealth of orchids and other epiphytes that burdened all the trees and stumps, cold and mist were forgotten in the joy of living in a land so unimaginally fair. In this region of alternate gloom and delight I studied the quetzal, the prong-billed barbet, the emerald toucanet, and their neighbors amid the dripping forest.

The loveliest inhabitant of these forests was the quetzal. The frowsy mounted specimens that one too often sees convey no conception of the magnificence of the living, vibrant bird. It is

difficult to find a photograph or painting that does full justice to it. Accordingly, I shall give here, with only slight verbal changes, a word-picture that I wrote in my journal on April 28, 1938, when I had the living birds daily before me: "The male is a supremely lovely bird, the most beautiful, all things considered, that I have ever seen. He owes his beauty to the intensity and arresting contrasts of his coloration, the resplendent sheen and glitter of his plumage, the elegance of his ornamentation, the symmetry of his form, and the noble dignity of his carriage. In the simplicity and restraint of his ornamental plumes is a chaste and classic elegance, which





The male, "a supremely lovely bird."

contrasts pleasingly with the oriental or arabesque profusion and superabundance of decoration of some of the more ornate birds of paradise. His whole head and upper plumage are an intense and glittering green. His lower breast, belly, and under tail coverts are the richest crimson. The green of his chest meets the red of his breast in a line that is convex downward. His head is adorned by up-standing bristly feathers that form a narrow, sharply ridged crest extending from the forehead to the hindhead.

"The dark central feathers of his tail are wholly concealed by the greatly elongated tail coverts, which are golden-green with blue or violet iridescence, and have loose, soft barbs. The two middle and longest of these covert feathers are longer than his body and stretch far beyond the tip of his tail, which is of normal length. Slender and flexible, they cross each other above the end of the tail, and thence diverging gradually, form a long, gracefully curving train which hangs below the bird while he

perches proudly upright on a branch, and ripples lightly behind him as he flies.

"The female quetzal is far less beautiful than her exquisite mate. She is one of the few female trogons whose upper plumage is green like the male's, instead of brown or slate-colored. Her head is dark smoky gray, more or less tinged with green, and bears no trace of the male's crest. Her bill and large eyes are black. The green of her back and rump is less intense than that of her mate. The upper coverts of her wings and tail are green and elongated like his, but not nearly as much. The tips of her wing coverts scarcely extend beyond the margins of her folded wings, and her longest tail coverts only slightly exceed her tail in length."

**F**ROM THE COTTAGE on the ridge, I often watched quetzals emerge from the forest in the ravine to eat the large, green, one-seeded fruits of a huge *ira rosa* tree. They plucked the fruits in the usual manner of trogons, by darting up, seizing one in the bill, and pulling it off without alighting. Such fruit-catching, spectacular in any trogon, was especially delightful to watch when practiced by a male quetzal with a long, rippling train. I noticed that when a male left his perch, he did not fly forward, as most birds do, but dropped off backward. Thereby he avoided dragging his long plumes over rough bark, which would soon have frayed them. Females, without plumes that would be damaged, sometimes took off in the same way. Between flights, the quetzals perched very upright, with their tails directed downward or even inclined slightly forward beneath the branch, as is usual with trogons. When alarmed, agitated, or suspicious, both sexes rapidly spread their tails fanwise, sending forth evanescent flashes of white from the outer feathers.

From my arrival at Montaña Azul in July until the last days of February, I attributed only a single kind of call to the quetzal. This was a loud, startled-sounding *wac-wac, wac-wac* that it often voiced in flight. In late February, as the nesting season approached, I began to hear very different notes. In March, the quetzals called much, revealing a varied vocabulary, including notes of rare beauty. They were most vocal in calm, cloud-veiled dawns, and late on misty afternoons; in bright weather they called

less, and on windy days rarely broke silence. At its best, the quetzal's voice is softer yet deeper, fuller, more powerful than that of any other trogon I have heard. The notes are not distinctly separated but slurred and fused, producing a flow of mellow sound that is indescribably beautiful as it floats out of the misty forest.

At times, especially at the outset of the nesting season, quetzals voiced notes of a whining, complaining character, which seemed to be mating calls. Later, when they were incubating, both male and female often delivered rather similar nasal or whining notes, as each came to replace the other in the nest. In May, I became aware of an utterance very different from all of the foregoing calls—a high, soprano, sliding *whoow*, not especially loud—a surprising performance which, when first heard, I was inclined to attribute to a mammal rather than to a bird.

The flight display of the male quetzal is accompanied by an utterance all its own, obviously a modification of the flight note. From March to July, the male occasionally flies up well above the treetops, circles around in the air, then descends into sheltering foliage. His flight on these sallies is strong, swift, and direct, often with little of the usual undulatory motion; but if he rises very high, it may at the end become strongly wavy and jerky, suggesting that he has reached his limit. As he soars up into the air, he shouts loudly a phrase which at various times I wrote as *wac-wac, wac-wac, wac-wac*, but often as *very-good, very-good, very-good*. These spectacular ascents spring from pure exuberance; they appear not to be used in courtship and are certainly not for the purpose of finding food. I know of no other trogon, nor any bird of dense tropical forest at whatever altitude, which indulges in similar exercises. The high flights of quetzals are another expression of the abounding vitality that has produced their elegant plumes, the approach to male coloration in females, although this is unusual among trogons, and the long breeding season extending into inclement months.

One afternoon in early March, I stood in a narrow clearing in the forest, in the midst of which was a tall decaying trunk, where a pair of quetzals were interested in a possible nest site. As the sun sank low, I heard mellow calls min-



gled with whining notes float out of the bordering woodland. Presently a male rushed out into the clearing—in a wild, dashing, irregular flight, his long, loose wing covert and tail covert plumes lashing about—shouting *wac-wac-wac-wac way-ho way-ho*. This appeared to be a different kind of flight display, accompanied by a slightly different call.

Not until late February or early March did quetzals appear to become abundant in the neighborhood. Possibly they had arrived from elsewhere; but their apparent increase may have been caused by their greater activity and, above all, more frequent use of their voices. By early March, they seemed quite generally to have paired. I doubt that quetzals form true flocks, which appear not to occur among the American members of the family.

**T**HE QUETZAL NESTS in a hole in a decaying trunk, upright or slightly leaning, which may be situated in the forest or in an adjoining clearing, sometimes as much as one hundred yards from woodland. The six nests that I found in 1938 ranged from fourteen to about ninety feet above the ground. In size and form, the cavities closely resembled those of the larger woodpeckers. The single entrance at the top was irregularly round, about four inches in diameter. A freshly carved hole extended only four and a half inches below the doorway and contained broken eggs. Another nest, old and weathered when the quetzals began to use it, was eleven inches deep and six inches wide. Although the other nests were inaccessible, it appeared, from the positions of the birds when incubating or feeding nestlings in them, that most were much deeper than the shallow one with the broken eggs.

The trunk in which quetzals nest is sometimes in the last stages of decay. One nest cavity was thirty feet up, in the top of a massive but very rotten stub standing in a pasture. Since I had not seen a lower nest, I tried hard to glimpse its contents by standing on the next-to-highest rung of a tall ladder and holding a mirror at the doorway, still above my head, while the interior was illuminated by an electric bulb. While I was engaged in this foolhardy venture, a visiting naturalist prophesied disaster. I could see nothing in the hole, yet I dared not step



upon the topmost rung and depend for support on the trunk alone. Later, after the nestlings had flown, we put a rope around this trunk, cut some of the supporting prop-roots, and pulled it over in order to examine and measure the cavity. When it struck the ground, the upper part fell into a formless heap of rotten wood. We could not even find the place where the nest had been. Not infrequently, a woodpecker hole remains intact and sound after falling from twice or thrice the height of the quetzals' nests.

I did not in any instance see quetzals actually carve their nest chamber. But the shallow cavity already mentioned had been freshly carved in decaying wood still considerably sounder than that which collapsed into a heap when it fell. The man in front of whose cabin

it stood told me he had seen the male and female quetzals taking turns at carving it. This is the way that most, if not all, species of trogons make their nests.

Early in March, a pair was interested in a tall, branchless, decaying trunk that stood in a pasture near the forest's edge. The female clung upright in front of an old, long-abandoned woodpecker hole near the top of the stub. She braced her spread tail against the trunk, revealing the white outer feathers narrowly barred with black, and bit at the decaying wood around the doorway, tearing off fairly large flakes and dropping them, while her mate rested nearby. She continued this occupation for a minute or less, then both returned to the forest. This pair finally nested in an old hole in the top of a neighboring dead trunk.





*The male quetzal at its nest hole: "The trunk in which quetzals nest is sometimes in the last stages of decay."*

Over most of the quetzal's altitudinal range, only smaller woodpeckers breed. Before it could occupy one of their nest holes, the quetzal would need to enlarge it, especially the doorway. I believe that this is what the pair I watched had started to do, but they abandoned the undertaking when they found something that could be made to serve with less effort. Whenever an old hole of their own remains sound enough to hold their eggs, even if in a precarious state of decay, they appear to use it again. And when still available, the cavity in which the first brood was raised is cleaned out and occupied for the second. When they can find nothing ready-made, the quetzals appear to carve their cavity from the beginning, in soft, decaying wood, as do other trogons.

The female lays her eggs upon loose fragments of wood on the unlined bottom of the cavity. I saw only two sets, one in May and the other in June. The eggs in the May nest had been broken, and feathers scattered around revealed the work of a predator. There had been at least two light blue eggs. The one still whole enough to be measured was 38.9 by 30.2 millimeters. The June nest also contained two eggs.

ON APRIL 5th, I was elated to find a male quetzal sitting in a cavity high in a massive trunk beside the forest. I wrote in my journal: "He sat facing outward, with his head and shoulders projecting through the aperture. His tail was at the back of the cavity, but one of the long feathers of his train was bent double and projected through the entrance, above the bird's left shoulder. Where, then, is the Guatemalan story of the nesting cavity with two entrances, so that the male quetzal's tail can project through the rear one? Or the Costa Rican version that the bird sits in the nest with head inside and tail dangling through the single doorway?"

Three days later, I first found the male quetzal apparently incubating, as his body was wholly invisible. I approached very quietly, so that he did not hear me and look out. All I could see was the projecting ends of the two longest plumes of his train. Had the trunk been covered with epiphytes, these feathers might have been mistaken for the green fronds of a fern.

On subsequent visits to this and two other nests, I learned that I could always detect from a distance the presence of the male by the ends of these long cen-

tral tail coverts, which projected from six inches to a foot into the outer air. These plumes made a good barometer. When the weather was fair and calm, they pointed straight outward and were motionless. When a breeze blew, they fluttered gracefully. When the raindrops burdened the loose barbs, they drooped forlornly. In the wet year of 1938, I saw them all too often in this dejected attitude.

It was early evident that both sexes took substantial shares in incubating the eggs. In order to learn in more detail how they divided the day between them, I watched the nests for about fifty-eight hours during this period. I made records covering all hours of the day while my first pair incubated both their first and second sets of eggs and while my second pair incubated their second set.

The records for all three nestings showed substantial similarity in the division of the day between the male and female. She incubated every night and during the middle of the day. The male took a long turn on the eggs in the morning and again in the afternoon. Each sex was in charge of the nest twice in every cycle of twenty-four hours.





*Life and death in the cloud forest: a decaying leaf, epiphytic plants, tree ferns, and delicate orchids—Cattleya skinneri, the national flower of Costa Rica. Montane forest of this type is indispensable to the quetzal.*



Their turns were not always continuous but might be interrupted by short absences, during which the eggs were unattended. The female most probably slept in the nest continuously through the night, for quetzals, like other trogons, appear to be strictly diurnal. Although the basic pattern was the same for all the nests, I noticed minor variations from nest to nest, and on different days at the same nest.

There was no set nest-relief ceremony. Less closely synchronized than mated birds of certain other kinds, one member of the pair might come before its mate was ready to go; or one would go before the other came. Nevertheless, in spite of inconsistencies, they managed to get through their three-shift day without leaving the eggs exposed for many minutes. After incubation was well started, the nest was rarely left unattended for more than a half-hour at a stretch.

For many trogons, entry into the nest is a protracted procedure. They cling be-

fore the doorway, peering cautiously from side to side, often for several minutes, before they slip in. If they notice something that excites their suspicion, they dart away, to return later and repeat the time-consuming performance. The quetzals entered with less hesitation, often hardly delaying in front of the doorway, or at most making only a brief survey from this position.

While I watched them, the quetzals did not often need to drive intruders from near their nests. Soon after they began to incubate, the male and female of my first pair joined to chase a trespassing female of their kind. Later, I saw this male pursue an emerald toucanet, who might have eaten his eggs, and he twice chased a masked tityra, who seemed to be prospecting for a nest cavity in the same trunk. Another pair of quetzals were worried by a pair of sulphur-bellied flycatchers who were building a nest near their own.

Only at the second nest of the second pair of quetzals could I see the eggs and

learn the length of the incubation period. The parents started to incubate on June 23rd or 24th, and the nestlings hatched on July 11th, after an incubation period of seventeen or eighteen days, which agrees closely with the periods of other trogons.

**L**IKE OTHER TROGON hatchlings, those of the quetzal bore no vestige of down on their pink skins. Their eyes were tightly closed. Each had a prominent white egg-tooth near the tip of its upper mandible, which was slightly shorter than the lower. Their heels were studded with the short protuberances typical of birds that grow up in nurseries with unlined wooden floors. When I first saw the two newly hatched young, only a few fragments of blue eggshell remained in the nest.

During their first few days, the young quetzals were brooded much of the time. They were nourished almost if not quite exclusively with small insects; not until





later did fruits become abundant in their diet. The parents at first kept the nest clean, removing all droppings, which they must have swallowed, for I saw none carried away in their bills. This attention to sanitation was eventually relaxed. Nevertheless, quetzals do more to keep their nests clean than the other trogons I have studied, who did not even remove empty shells.

When the nestlings were two days old, the sheaths of both body and flight feathers were emerging from their pink skins. At four days, the chicks showed slight change, except that they were bigger and their pinfeathers were longer. When they were five days old, their eyelids began to separate. At eight days, they could open their eyes, although much of the time they rested with their eyelids closed. The nestlings were ten days old before the remiges and rectrices began to expand, a day after the wing coverts had reached the same stage. Their bills and feet were now becoming blackish.

At this stage, the young quetzals always rested side by side on the bottom of the chamber, with their heads supported against the wall and their bills pointed almost straight upward. They did not appear to be comfortable unless their heads were in this position; even when removed from the nest and placed where they lacked a chin-support, they held them turned abruptly upward. From time to time, when they appeared to be hungry, they stretched up their necks, opened their mouths, then sharply closed them with a snap. Evidently, like young woodpeckers and motmots, they took food from their parents in this abrupt fashion, instead of holding their mouths passively open, in the manner of passerine nestlings.

Until their tenth day, the young quetzals seemed to be nourished almost wholly with animal food. On their eighth morning, their mother came with a golden beetle about an inch long. Everywhere a shining golden color, it was the most splendid coleopteran I had ever





seen, among beetles what the quetzal is among birds, and appropriate food for nestlings that would develop golden glints in their plumage. After two weeks, fruits, especially those of trees of the laurel family, became increasingly prominent in the nestlings' diet.

When the nestlings were eleven days old, buffy spots appeared on their wing coverts. At two weeks, their bodies were well covered with feathers, at least when their wings were folded; but the feathers of their heads had only on the preceding day begun to escape their horny sheaths. The contrast between the well-clothed body and naked head was striking, and gave the young quetzals a slightly vulturine aspect. From the age of two weeks onward, green became increasingly prominent in their plumage. This change was accomplished by covering the dull early plumage by brighter feathers that expanded later.

When the nestlings were sixteen days old, their mother began to behave most unaccountably. She ceased to brood them by night, although they seemed too young to be left uncovered in that inclement climate, and by day she fed them less and less. Such early cessation of feeding by the female may be frequent among trogons, as I have noticed it in two other species, the vermilion-breasted and the black-throated.

To the male quetzal, then, fell the whole task of attending the two nestlings during their last five or six days in the low hole. With his plumage showing signs of his strenuous activities and the long feathers of his train broken off short, he was an Apollo in the service of King Admetus. He no longer brooded, but the young birds' cloak of feathers made this unnecessary now. Nor did he clean the nest, with the result that the growing accumulation of big, regurgitated seeds and other waste slowly raised the level of the floor, and the young stood each day higher in their nursery, nearer the doorway, where it was easier for them to reach up for their meals.

I watched from six to nine o'clock on the morning when the nestlings were nineteen days old. Their mother failed to appear, but their father came seven times. On three of his visits he regurgitated a second item, making ten feedings in three hours. This was not many, but he brought such substantial items, including big fruits and lizards, that the young appetites were soon satisfied. By

half-past seven, the nestlings took their meals sluggishly. When hungry, they would appear in the doorway and snatch the food in a trice; but when satiated they remained in the bottom of the chamber, making a low, sizzling sound as nourishment was presented to them. Then their father would enter and coax them to swallow what he had brought. Even when he went inside, he was not always successful in delivering the meal. He would emerge, fly to a nearby tree, and rest there, patiently holding the article in his bill for many minutes, while the nestlings' digestive juices acted upon earlier contributions. After a while, he would go again to the nest with the same piece of food, and at length a nestling would swallow it.

ON THE MORNING of August 1st, when the nestlings were three weeks old, I first saw one stand on the doorsill, looking out, for a few minutes after its father had fed it. Two days later, I removed one of the young from the cavity and placed it on a mossy log beside me, while I wrote a description of its plumage. Neither of the nestlings had ever tried to use its wings when taken from the nest in the past, and at first this one made no attempt to fly. But after standing quietly beside me for a while, it suddenly spread its wings and flew about twenty-five feet on a horizontal course, to alight upon another fallen log. Its father, who had been watching us from a tree in front of the nest, followed immediately and alighted close beside it on the log. After remaining there for a minute, he moved to a low perch a short distance beyond the nestling. When I approached to retrieve the young quetzal, it did not try to escape me.

When I took the fledgling to its nest, the other was in the doorway, looking out. As I mounted the ladder toward it, this bird took wing and flew down the slope in front of the nest, covering about one hundred fifty feet on a slightly descending course, to alight about twenty-five feet up in a small Yos tree. Its first flight was direct but slow. Its father darted after the fledgling and followed it closely, in the manner of parent birds of many kinds when their young first fly.

When I returned early in the afternoon, the second fledgling was resting in the tree in front of the nest, where it repeated over and over a beautiful, low,

soft whistle. The other, who had flown first, had moved farther down the slope to perch high in a tree at the edge of the woods. Here its father brought it food, and rested close to it when not off foraging. While this fledgling received as much as it could eat, the other called and called for attention in vain, although its soft whistles were faintly audible at the edge of the woods where its father perched. All afternoon it lingered in the same tree in front of the nest, and the parent did not come near it.

At five o'clock, despairing of attracting attention where it had so long perched, the second fledgling flew down the slope, in the direction where it had last seen or heard its parent. Alighting in a small tree, it continued to call tirelessly. Now it varied its whistles, uttering some that were longer and slightly sharper than those I had previously heard and others that sounded pleading and mournful. Still nothing was brought to appease its hunger.

At a quarter past five, the neglected fledgling continued down the slope to the edge of the woods and perched in a cecropia tree covered with a dense tapestry of climbing bamboo. But the other fledgling, accompanied by its father, had long since gone farther into the woods, and neither was now in view. The neglected young quetzal continued to call ceaselessly, until at half-past five its father at last brought it the big green fruit of an ira, which quieted its pleas. For the next half-hour, the parent, doubtless tired after a long day devoted to hunting food for his young, rested quietly on a nearby branch, without bringing another meal to the fledgling. As night fell, he flew into the woods, leaving the young bird alone on the cecropia branch, where it still perched quietly when I departed in the rainy dusk. Here it passed its first night in the open. After my arrival at a quarter to two, it received no food except the single fruit brought to it nearly four hours later. Just as happened with broods of the mountain trogon and the black-throated trogon, the fledgling who remained behind was for hours neglected while the male parent attended the one who flew first.

At dawn, I found the second young quetzal on the cecropia bough where it had passed the night. Soon its faithful father fed it, then led it deeper into the woods, thus ending my long association with the quetzals of Montaña Azul. ▲