

*Most Beautiful of All - -*

# The Turquoise-browed Motmot

By ALEXANDER F. SKUTCH

UNLIKE THEIR RELATIVES the kingfishers, which are of almost world-wide distribution, the motmots are confined to the mainland and closely adjacent islands of tropical America. With their softly blended colors, set off by bright markings on the head and foreneck, they are lovely birds, and their beauty is enhanced by their peculiar tails, which in most species have the central pair of feathers far longer than the outer ones. These central tail feathers have a length of naked shaft which ends in a racquet-like expansion, so that their terminal portion seems to be joined to the more basal part by a stiff wire. The central tail feathers do not grow out of the body in this peculiar form, but at first they bear vanes throughout their length, although they are often somewhat narrower just behind the terminal expansion. In this region the barbs which form the vanes are loosely attached, so that they readily wear away, or break off as the motmot preens its tail feathers, until only the central shaft remains. It is probably not true that the motmot deliberately undertakes to adorn itself by trimming its tail, but the structure of the feathers makes this result inevitable. These distinctive tail feathers facilitate the recognition of the typical motmots.

Although South America is the headquarters of many of the families of birds peculiar to the New World, including tanagers, toucans, puff-birds and jacamars, the motmots belong pre-eminently to Central America and tropical México, where most of the eight species which make up this small family are to be found. I spent nearly a year travelling widely in Perú, Ecuador and Colombia without meeting a single motmot. But in the lowlands of northern Central America



gram cannot be predicted. Several entomologists have suggested that the upset in insect populations as a result of the program will create new pests, as their normal predators will be eliminated.

This possibility is very likely, as the only real control of insect populations at the present time is being done by other insects and disease. Biological control, by manipulating insect populations and culturing specific disease organisms, is a promising field which has not been given a full opportunity to demonstrate its potentialities. Very often introduced insects are troublesome because they no longer have the normal controls which kept them in balance in their native lands. A study of their normal parasites, predators and diseases which attack them there usually enables us

Many workers in the field of insect control have asked us to compile the known facts, evaluate the merits and disadvantages of pesticide use, and on the basis of what is known, advise the American people. The Society and the Foundation are in an ideal position to do this. Whereas we are dedicated to the protection of wildlife and natural environments, we are also concerned with the problem of increasing productivity of our resources through management so as to raise the general welfare of the world's people.

If pesticides can be used without endangering fish and wildlife, wild environments and human health, our societies will welcome them. If, on the other hand, their use gives only temporary advantage while poisons accumulate in our soils and living creatures and the insect targets become immune, then we must make every attempt to oppose them.

Whatever the answer, we still don't have it. But we *must* get it.

***This picture indicates the size of the mounds built by fire ants. They are most common over open areas such as cultivated fields and pastures, parks, lawns, meadows. They are a pest!***

*Photo: Agricultural Research Service, USDA*



to introduce a few which will cheerfully carry on their work for us in this country.

The use of pesticides is being studied by the New York Zoological Society and its affiliate, the Conservation Foundation. After many discussions of the problem by the staff and officers of our two organizations, it would seem that we can play an important and needed role in contributing to the formulation of an impartial objective judgment concerning pesticide use.







**Left — A Turquoise-browed Motmot in our collection, showing the tail vanes stripped. Above — The Tela River in the Caribbean lowlands of Honduras. Motmots nested in the banks along this shallow river.**

*Upper photo by the author.*

and southern México, no one with an eye for birds can go far without seeing these beautiful creatures and falling under their spell. They are especially prominent in the hot, arid regions, in part because the sparse vegetation provides relatively little concealment, in part, no doubt, because they are actually more abundant than amid the heavier growth of the humid lowlands. Of these motmots of dry or deforested country, the most widely distributed is the Turquoise-browed (*Eumomota superciliosa*) which ranges from northwestern Costa Rica and eastern Nicaragua through the lowlands of both coasts to Oaxaca and Veracruz in México.\*

I may be prejudiced in favor of the Turquoise-browed Motmot because it was the first member of the family that I knew intimately, but in my opinion it is the most beautiful of all the motmots. It owes no small part of its outstanding

loveliness to its tail, which has the vaneless portion of the shafts much longer than in most other species, and this imparts to it an airy grace beyond that of its relatives. The softly blended colors of its plumage, subdued greens, blues and rufescent browns, seem to have been applied with pastels rather than enamels. Its brightest color is the broad band of exquisite turquoise which arches above each eye, bordered on the lower side by a black stripe passing through the eye. On its foreneck it wears, as a sort of badge or insignia, an isolated patch of black bordered on each side by turquoise blue. Its strong, broad, black bill is provided with fine serrations which give it a surer hold on its prey. As in the allied kingfishers, a single toe is directed backward, and of the three forwardly directed toes the outer is joined to the central for much of its length.

The Turquoise-browed Motmot is an inactive bird, resting motionless for long periods, in the shade of a thicket, on a bough overhanging a stream or, in the banana-producing districts of northern Central America, on a telephone wire beside a railroad track. Here, if the observer re-

frains from approaching too closely, he may admire at his leisure the lovely plumage suffused with morning sunshine. From time to time the contemplative bird sways its long tail from side to side like a slowly swinging pendulum, and often it is held tilted sideways. When the motmot executes a sudden about-face, it carefully twitches its tail up and over the perch with a graceful flourish that saves the plumes from abrasion.

Their habitual immobility has earned for the motmots as a family the designation *bobos* (fools) in Spanish-speaking countries, but their only folly is the avoidance of unnecessary exertion in a hot climate. Although the turquoise-browed bird much of the time appears immersed in a trance, it has not severed contact with the outer world. Nothing that moves in the circle of its vision seems to escape its large brown eyes. With surprising suddenness it breaks its long period of immobility with a rapid forward dart, perhaps to pluck a green caterpillar from a green leaf a dozen yards away. Returning to its perch, it beats its prey resoundingly against the branch before swallowing it. One sometimes hears the loud whacks coming from a thicket where the motmot rests unseen. Its diet includes beetles, caterpillars and other insects, as well as spiders, worms and small lizards. Often it overtakes winged insects in the air, in the manner of a flycatcher. Motmots and jacamars are among the very few birds which habitually prey upon the larger and more brilliant butterflies.

The motmots' flight is swift and undulatory but rarely long sustained. Unfortunately they have not, like the orioles, voices as lovely as their plumage. Rather silent through much of the year, with the onset of the mating season in March they frequently call *cawak cawak*, almost invariably twice together, or sometimes a single, long-drawn *cawaaalk*, all in a deep, throaty voice, as though they talked with a full mouth. In the scrubby thickets, male and female call to each other in their thick, lustreless voices, rest motionless side by side on the same branch, and at intervals fly down to examine the banks where they will soon dig their burrows.

In country underlain by porous limestone, as much of the Yucatán Peninsula is, the Turquoise-browed Motmots are said to nest and to pass

much of their time in caverns, grottoes and wells, laying their eggs in suitable crannies in the pitted walls. In the regions where I have studied them, such subterranean retreats are not available and they excavate their burrows in banks, much in the manner of kingfishers. In some of the dry interior valleys of Guatemala where cacti and thorny scrub form the dominant vegetation, as along the middle reaches of the Río Motagua, the walls of barrancas and escarpments on the barren hillsides are perforated by many tunnels, apparently made largely by this species and the equally abundant Russet-crowned Motmot. Nearer the coast, where the magnificent rainforest is tall and heavy and clearings left by the shifting cultivation are rapidly overgrown by lush, impenetrable thickets, the Turquoise-browed Motmots nest chiefly in the banks of streams at the season when the current is low, although they also take advantage of the sides of railroad cuttings and similar vertical exposures of soil. If an extensive area of tangled second-growth vegetation, such as they favor in this region, contains few suitable nest sites, a number of pairs will perforce breed close together. I remember a railroad cutting where seven pairs dug their tunnels within a few yards of each other and proceeded with their nesting despite frequent interruptions by pedestrians and the noisy passage of an occasional train. But where river banks provide an abundance of nest sites, each pair prefers to rear its family at a distance from its neighbors.

When I found my first motmots' nest in the bank of a Honduran stream, it already contained eggs. With a view to following the course of events, I carefully uncovered the chamber, then equipped it with a glass roof protected by a wooden lid. But the motmots would not tolerate such extensive alterations to their burrow. They abandoned their nest and three days later set about to excavate a new tunnel in a neighboring part of the bank. I was not displeased with this unintended result of my interference, for it provided an opportunity to study the motmots' nesting operations from the very beginning. The sexes were alike in plumage, and at first I could not distinguish the male from the female. But when one presented an insect or a spider to the other, I made the assumption that the attentive one probably was the male, and by a disarranged

feather or a dust spot on the plumage, I could then distinguish the twain for brief periods, despite their changes in position.

It soon became evident that although both sexes participated in the labor of excavation, they did not take equal shares, but the female did most of the work. Each time she entered the boring she kicked vigorously, using her short legs alternately and sending back two intermittent, parallel jets of sand, which at first shot out of the tunnel but fell short of its mouth as they followed her inward. Apparently she used her strong bill to loosen the earth at the head of excavation, then gradually kicked the soil outward each time she returned to her task, for she never moved back to the entrance pushing the loosened material before her. After two to eighteen minutes in the burrow she emerged and flew to perch in a willow tree beside her mate, who after a few minutes flew in turn to the excavation, such alternation at the task of nest building being the rule in motmots, kingfishers, jacamars, woodpeckers, trogons and many other hole-nesting birds. But the male's spells in the boring were much shorter than his mate's, and sometimes instead of getting along with the work he would delay in the doorway, scratch a little with his feet or peck with his bill, look around at his partner, kick out a little more earth, look around again, and finally fly back to perch beside her without having accomplished anything of account. It certainly seemed that by his symbolic digging and his gifts of food he was coaxing and encouraging the female to intensify her efforts, without doing a fair share of the work himself. Of course, since I could not identify the sexes except by their conduct, it is not impossible that the male motmot was the earnest toiler, the female the food-giver and the coaxer, but this is unlikely.

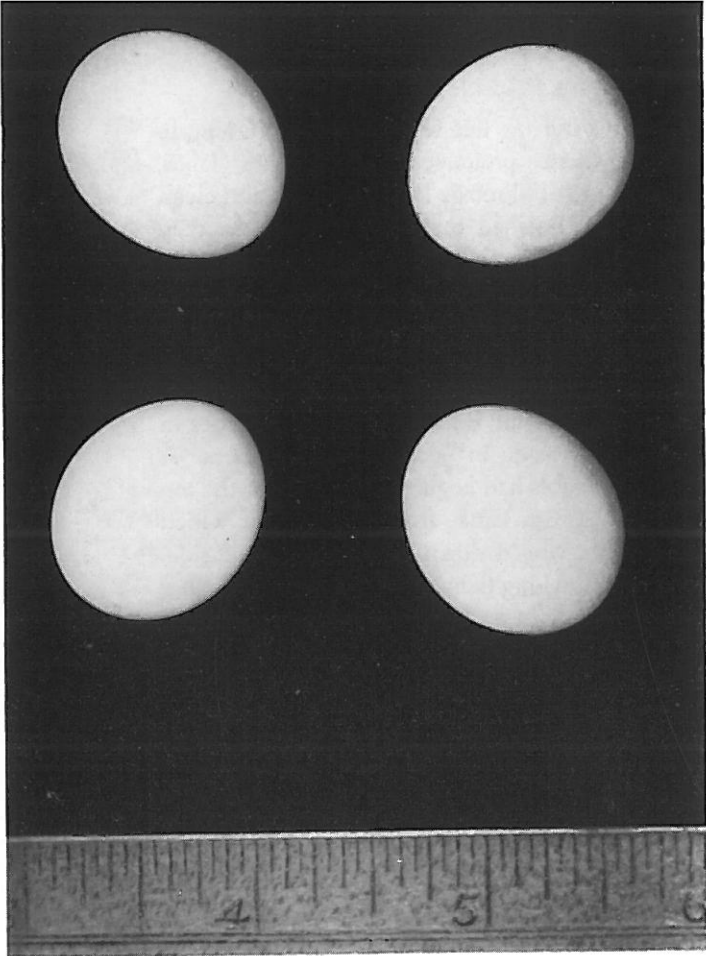
The motmots worked a long day, continuing until about five o'clock in the evening, and on some days they lengthened their tunnel by as much as fifteen inches. At first they backed out tail first after each spell of work, but after four days they emerged head first, indicating that they had now made an enlargement which permitted them to turn around. This expansion at the inner end of the tunnel was the chamber where they would lay their eggs and rear their young. In somewhat less than five days these two birds

had dug a burrow five feet two inches in length. Despite their prolonged subterranean labor, their beautiful plumage looked as fresh and clean when they finished their tunnel as when they began it.

Four other burrows that I measured were between fifty and sixty inches in length, but burrows up to eight feet long were long ago found by Robert Owen in Baja Verapaz, Guatemala. The shortest of my burrows, only forty inches in length, was made in peculiar circumstances. A pair of motmots had begun to tunnel near the top of a low stream bank, from the edge of which the ground sloped down on the landward side, so that before long they found themselves digging out into the light and air. One can imagine their surprise and disappointment. But they lost no time in starting a second burrow near by, and since the season was now far advanced and the female's need to lay was evidently pressing, they contented themselves with an unusually short tunnel. This was so straight that from the mouth I could look right into the expanded chamber at the inner end. Most burrows curve gently to the right or left, so that the brood chamber cannot be seen from the front.

The motmots take no soft lining into their burrow but deposit their eggs on the earthen floor of the nest chamber. The set consists usually of four, but sometimes of only three, short, blunt, pure white eggs, which in the Caribbean lowlands of northern Central America are laid chiefly in late April and early May, when the rivers are low. Both sexes incubate, each sitting for an hour or more until relieved by its mate. The partner arriving to take its spell on the eggs perches above the entrance of the burrow and calls in a low voice until the other comes out, so that only one is within at a time. While sitting in the nest they continually regurgitate the shards of beetles and other hard, indigestible portions of their food, until at length the accumulated ejecta are compacted into a firm floor beneath the eggs and young.

At the short tunnel made by the pair that had earlier dug out into the sunlight, I could look in and see the motmot sitting on the eggs, but of course I could learn its normal position while incubating only by stealing up in the night while it was asleep. My first nocturnal visit brought me a



great surprise, for when I directed my electric torch into the tunnel its rays picked out a creature unfamiliar to me. A gray, furry animal had entered the burrow and slept there, probably digesting the eggs it had eaten! Such was my first startled impression, and only by noticing the turquoise on its brow and the blue on its wings could I convince myself that a motmot was present, slumbering peacefully on its eggs. Its body plumage was fluffed out so loosely, and its subdued colors were so transformed in the yellow artificial light, that it seemed to be clothed in fur rather than in feathers. The motmot, whose sex I could not learn, slept with its head inward and its long tail running straight forward into the tunnel, and in this orientation I found it on all my subsequent visits. Thereby it avoided bending its tail while it sat for long hours, and it preserved its ornate racquet-feathers clean and unbroken while performing its parental duties.

Because the motmots so readily deserted burrows which I prepared for study before they had finished laying, I could not determine the exact

length of the incubation period. One set of eggs, which I reached while they were still so fresh that the yolk showed through the translucent shell, hatched seventeen days later. But the full incubation period may well be a few days longer than this, for in the Blue-throated Green Motmot it is twenty-one days.

The newly hatched motmot bears not a trace of down or feathers on its pink skin. Its eyes are represented by prominent protuberances on the sides of the head. It peeps in a weak, hoarse voice. Soon after emerging from the shell it can hold itself erect, standing on its heels and supporting most of its weight on its swollen abdomen. Although its eyes are tightly closed, it is already sensitive to light, and if the rear of the nest chamber is opened it shuffles, along with its brothers and sisters, into the entrance tunnel, where it is difficult to reach. Both parents brood the nestlings and nourish them with brilliant butterflies, green mantises, caterpillars, many small



insects of diverse sorts, and lizards up to six inches in length. The attendants are most wary about entering the burrow, often delaying for many minutes on a perch some distance in front of it, holding the food in their bill and knocking it briskly against the branch as long as it continues to struggle. Inside the burrow, the soft parts of the lizards are somehow extracted from the skin, which is then allowed to lie on the floor until it decays. Since motmots give no more attention to their nest's sanitation than kingfishers and no waste matter is ever removed, the nursery chamber soon becomes infested with maggots and is disgustingly foul.



The young develop slowly and are about a week old before their eyelids start to open and their pinfeathers to push through the skin. At the age of twelve days they bristle with the long pinfeathers, from whose tips the plumage is beginning to emerge. When about twenty days old they are decently clad in feathers. They are now most difficult to remove for examination, for when their chamber is opened at the rear they retreat into the middle of the tunnel, beyond reach of either end. Sometimes by shining a light into the front of the burrow they can be driven back within reach. When they are from twenty-five to twenty-nine days old and can fly well they come forth into the outer world. They now closely resemble their parents in coloration, although their tails are far shorter and still lack the racquet-like tips. However, while perching the youngsters already sway them from side to side in the manner of their elders, at the same time making indescribable throaty noises which bear a recognizable resemblance to the adults' calls. Although their bills and feet are often caked with dirt, their plumage is as fresh and neat as if they had grown up in a nursery that had been kept scrupulously clean. One marvels

that such loveliness should have come into being in a putrid hole in the ground.

I have never had the good fortune to surprise them trimming their tails. But I am sure that the vanes are not merely worn away from the subterminal portion of the shaft as the birds move through dense vegetation, as some have imagined, for the denudation of the shaft begins while the central feathers, which alone undergo this transformation, are no longer than the lateral ones, so that they are shielded by them from contact with surrounding objects. In early June I found a young motmot, still attended by its parents, whose central tail feathers projected only an inch beyond the others, yet the shafts were already naked for a short distance above the terminal racquets. On another occasion, at the beginning of the breeding season, I saw an adult motmot, apparently just completing its molt, whose central tail feathers did not project at all beyond the lateral ones, yet the shafts were already vaneless for at least a short distance. Thus in the Turquoise-browed Motmot the falling away of the vanes begins long before the central tail feathers have reached their full length, and I have never seen an individual with fully grown feathers which did not have a long stretch of naked shaft. But in other motmots, such as the Broad-billed and the Blue-diademed, the central tail feathers reach nearly or quite their full length before denudation begins; and in these the vaneless portion of the shaft is always far shorter than in the Turquoise-browed Motmot.

**Upper left — Eggs of the Turquoise-browed Motmot. A set usually consists of 4, and they are pure white. Left — A nestling 12 or 13 days old. Below — All four eggs hatched; the babies are now 20-21 days old.**

*All photos by the author.*

