

MOTMOTS are among the few feathered creatures that use their bills to trim or "improve" their plumage. In the art of self-adornment, they doubtless anticipated mankind by thousands of years. Yet they have little need of such "beauty parlor" treatment, for even with their feathers as they grow from the body they would hold a high rank among the world's loveliest birds.

The motmots form a small family of about eight species restricted to tropical America, exclusive of the West Indies. Their nearest relatives are the kingfishers—a great, nearly cosmopolitan family—and the charming little red-throated green todies of the Greater Antilles. Although in superficial appearance and habits motmots bear slight resemblance to the single kind of kingfisher familiar to most North Americans, their similarity to some of the numerous forest-dwelling kingfishers of the Old World Tropics is greater; and in their mode of nesting in burrows the two families show close agreement. Like kingfishers, motmots have three toes directed forward, as in the song birds, but with the difference that the outer toe is joined to the middle one for much of its length. The motmot's bill, in some species decidedly broad and flat, usually distinctly downcurved at the end, is hardly longer than the head, and differs strikingly from the long, straight bill of the kingfishers. The cutting edges

At the age of 26 days the turquoise-browed motmot wore the colors of its parents, but its tail feathers are still short and have not yet been trimmed.



A broad-billed motmot. The right of the long, central tail feathers is not yet full grown. The trimming of the left feather, however, has been nearly completed.

Motmots-Dandies of the Bird World

By ALEXANDER F. SKUTCH

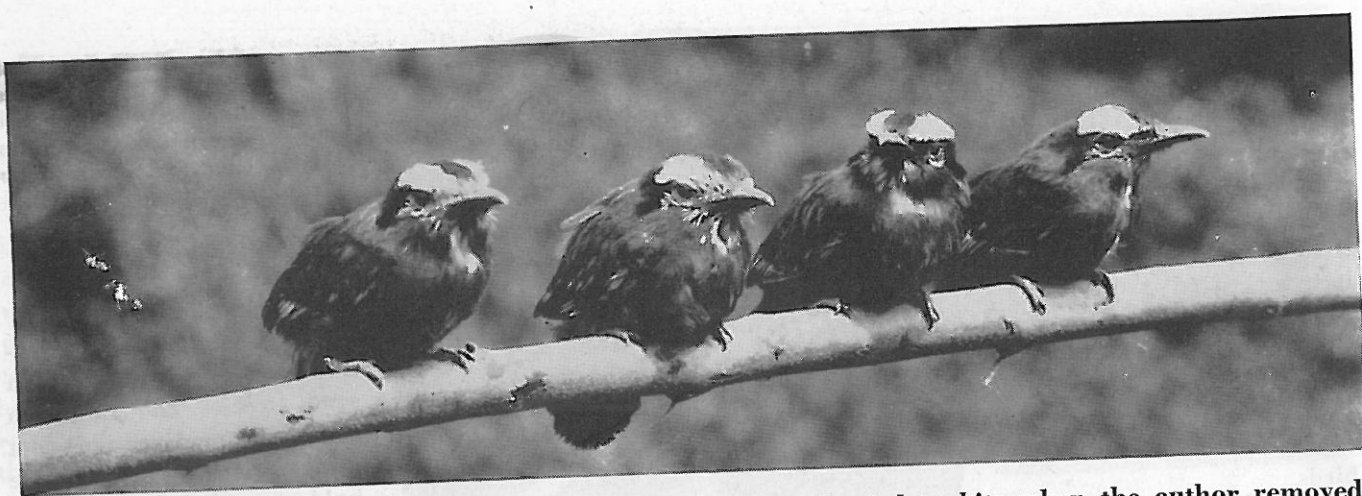
Photographs by the Author



of both mandibles are serrated or saw-like—coarsely in some species and finely in others—a modification that gives the birds a more secure hold upon their prey. In size motmots range from the little tody-motmot, about six inches long, to the big rufous motmots, which attain a length of twenty inches or more.

The colors of motmots are subdued rather than brilliant, but of shades so delicate and exquisitely blended that their refined beauty surpasses that of many a brighter bird. The upper plumage is predominantly green, varying in different species from parrot-green to olive-green, and the under surface of the body is often rufous or cinnamon. In some motmots the brightest color is the clear blue, or turquoise, that forms a broad band above each eye, or sometimes covers the whole crown. The wings and tail are often partly green and partly blue, and usually there is a tuft of black feathers over each ear and another on the lower foreneck. The sexes always wear the same colors and can not be distinguished by appearance.

An unusual feature of the motmots is the tail, the central feathers of which are, in the typical species, far longer than the lateral ones. As they grow out from their sheaths, the two middle tail feathers of most motmots are more or less narrowed just forward of their rounded tips. In this constricted region the webs or vanes are loosely attached to the feather-shaft,



These twenty-day-old turquoise-browed motmots screamed and tried to bite when the author removed them from their burrow to take their pictures. Although now clothed with feathers, they could hardly fly.

so that they readily break off as the bird passes its tail feathers through its serrated bill in preening. This leaves, at the end of the tail, a slender, naked stalk terminated by a roundish or oval expanse of web; the terminal portion of the tail comes to resemble a tennis racquet, or a ping-pong racquet, in miniature. In the elusive little tody-motmot, *Hylomanes momotula*, of the lowland forests of Central America, the middle tail feathers have at all times continuous webs and resemble those of more ordinary birds; and the same is true of the blue-throated green motmot, *Aspatha gularis*, which is an anomaly in a heat-loving family and braves the cold, thin air of the high mountains of Guatemala and Chiapas.

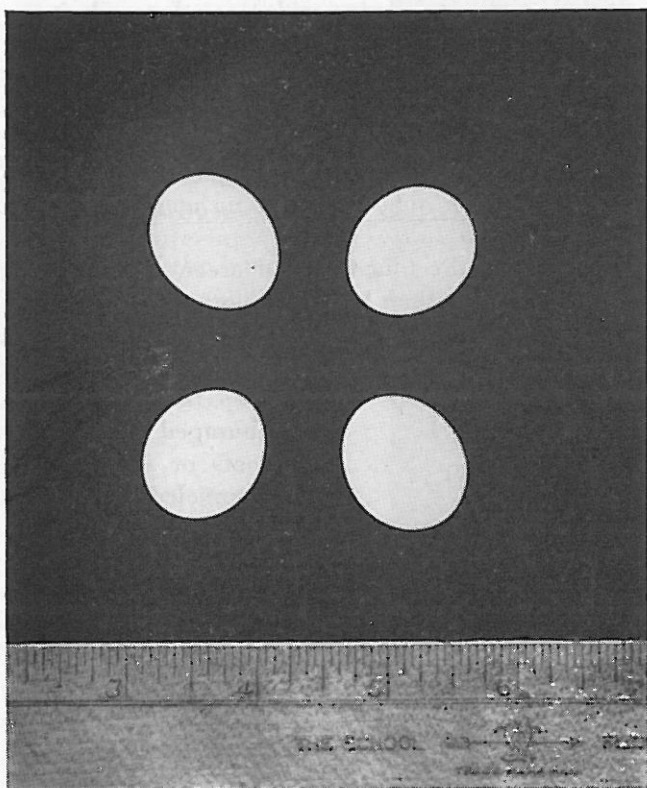
Motmots do not flock, but at least some of the species, including the blue-throated green motmot and the blue-diademed motmot, *Momotus momota*, live in pairs throughout the year. Their habit of resting quietly amid the foliage, often in the deepest shade of forest or thicket, makes these birds of subdued coloration extremely difficult to detect with the eyes. The blue-throated green motmot, although by no means rare amid the oak forests in parts of the Guatemalan highlands, is one of the most elusive birds I have ever studied. This habitual immobility, joined, in some of the species that have been less persecuted, with a degree of confidence in man—which all too often he fails to deserve—has earned for some of the motmots the name *pájaro bobo* or “stupid bird.”

Stupid or not, the motmot has extraordinarily keen eyesight, and when he espies something that promises to repay the effort he darts with surprising suddenness and speed to pluck the morsel from the air, the foliage, or the ground. Then, usually without having alighted at the end of his dart, he returns to his perch with his victim and, if it struggles, knocks it loudly against the branch until it becomes quiescent and is ready to be gulped down. The motmots' food consists of caterpillars, beetles, butterflies and other insects, spiders, lizards, worms and rarely a berry. I have sometimes been amazed by the distance at which a

motmot could detect a green caterpillar resting inconspicuously on a green leaf. But brilliant butterflies, winging swiftly past, also attract the hungry motmot, which easily overtakes them in the air. The larger and more spectacular butterflies are as a rule not relished by birds, which take little interest in them. Motmots, and dainty, glittering jacamars, are the chief butterfly-catchers among the birds of tropical America.

While perching, the motmots have a habit of swinging their tails from side to side, slowly, like a long pendulum. Or they may hold them for a while at the end of a sideways swing, tilted, like a pendulum defying the earth's gravitational pull. In their frequent about-faces while perching, their treatment of the long tail is delightful to behold. They lift it up and over the branch with an inimitable flourish, as though proud of this decorative appendage so different from that of any of their feathered neighbors, and careful not to rub and fray it against the bough. Even the blue-throated green motmot manages its untrimmed tail in this graceful fashion. Of the motmots I know, the most beautiful is the turquoise-browed motmot, *Eumomota superciliosa*, of northern Central America and southern Mexico. A large part of its surpassing grace consists in the more than usual length of the naked portion of the shaft of each of the middle tail feathers, which are exceptionally light and airy in appearance.

The utterances of motmots as a family are most varied. Like the peacock, that loveliest of motmots, the turquoise-browed, has a voice not in keeping with its elegant appearance. Its deep, throaty *cawaak cawaak*, seeming to be uttered with a full mouth, has in parts of Guatemala earned this bird the expressive designation of *toro voz*—“bull voice.” The broad-billed motmot, *Electron platyrhynchus*, has a similarly deep, dry and lusterless call—a full-toned *cwaa cwaa*. The widespread blue-diademed motmot voices a frog-like *hoot hoot* or *coot coot*, and other sounds somewhat weird and ghostly as they emanate from the



A set of four eggs of the turquoise-browed motmot temporarily taken from a burrow in Honduras. These eggs are a pure white.

deep shade of the forest's edge in the morning or evening twilight—for motmots are among the earliest of the purely diurnal birds to become active and the latest to retire at nightfall. This mystifying, ghostly, un-bird-like quality of voice is far more pronounced in the great rufous motmot, *Baryphthengus martii*. In the high rain-forest on Barro Colorado Island in the Panama Canal Zone, the call of this giant among motmots is one of the common dawn sounds of the dry season. The deep, muffled hoots pervade the slowly brightening forest, but rarely indeed is their author glimpsed amidst the clouds of foliage overhead.

Most melodious of the seven kinds of motmots that I have heard is the blue-throated green. As soon as they dart out of the long burrow in roadside bank, or wall of deep ravine, where they have slept together through the cold highland night, male and female lift their voices in unison to greet the dawn. A deliciously mellow piping, full, round and clear, arises from the birds, unseen amidst the still dusky foliage, and undulates afar over frost-whitened fields and through the silent oak woods in the dim crepuscular light. These melodious notes earn for the blue-throated green motmot a place beside the tinamous as one of the most gifted vocalists among feathered creatures that are not true song-birds.

It is believed by ornithologists that motmots originated in the area comprising southern Mexico and northern Central America, where today they are most abundant in kinds and apparently also as individuals.



A fledgling blue-throated green motmot, about five weeks old. A Guatemalan Indian boy found the bird and brought it to the author.

In the course of a good deal of bird-watching on both sides of the Andes in Peru and Ecuador, I saw not a single motmot. On my farm in the Térraba Valley in southern Costa Rica there is only one kind of motmot, the blue-diademed, which I often hear at my house at dawn, and frequently meet while riding my horse along roads bordered by woodland, especially in the early morning and late afternoon, when these birds most often venture forth from the depths of the forest or thicket where they lurk. But one must go to Guatemala or southern Mexico, especially in the more arid regions, to find motmots really plentiful. In the semi-desert middle reaches of the Motagua Valley in the former country, turquoise-browed and chestnut-headed motmots dwell among cactuses, prickly-pears and low, thorny trees that provide slight concealment. Here they are among the abundant birds of the region; one cannot miss them as he walks along the dusty roads between the forbidding cactus hedges. The walls of ravines, and rises of the terraces on the barren hillsides, are penetrated by innumerable nesting burrows, which appear to have been made by these two species of motmots.

Motmots dig their burrows into the banks beside streams, roads and railroad cuts, and sometimes, also, they nest in caves or crannies in the sides of sink-holes in limestone formations. I have watched both turquoise-browed motmots and blue-throated green motmots excavate their tunnels, and in both instances the work was done by male and female taking turns. Neither member of the pair works unless the mate

waits close by. The birds loosen the earth with their stout bills and push it from the burrow with their feet. This last is accomplished almost entirely as they enter to resume work, when with vigorous alternating kicks they throw behind them two parallel, intermittent jets of loose material, which at first spurt out well beyond the mouth of the tunnel, but follow the bird inward and soon pass from the watcher's view. Thus each time a motmot visits the head of excavation it gradually shifts outward the earth previously loosened. The pair of blue-throated green motmots that I watched while they dug alternated in shifts lasting from three to twelve minutes and I could detect no inequality in the parts taken by the male and female, which, indeed, I could not distinguish.

But the situation was somewhat different with the turquoise-browed motmots that I watched dig their burrow into the bank of a lowland stream in Honduras. One member of the pair, which I recognized, temporarily at least, by a spot of dust on its plumage, or a disarranged feather, seemed far more eager to have its mate work than to toil in the burrow itself. When its turn came it would fly from the willow tree in which they rested down to the bank, where it would peck with its bill or scratch with its feet at the mouth of the burrow, or at a point near by, then look around to see whether the mate was paying attention, scratch and peck again, then fly back beside its partner in the willow tree without having done any real work. This wile often had the desired effect, and the mate would then enter the burrow for another spell of honest toil. Since the bird that was more eager to see his mate work than to work himself sometimes gave a caterpillar or similar morsel to the other, I surmised that it was the male of the pair.

In the loose, sandy soil of lowland stream banks the burrows of the turquoise-browed motmot are generally from forty inches to five feet, or rarely as much as eight feet, in length. As a rule they are nearly straight, curving gently to right or left just enough to make it impossible to see the enlarged chamber at the inner end, when looking in from the front with the aid of an electric torch. When studying these burrows, I found it easy to estimate the position of the end, and prepared them for future observations by sinking from the surface at the top of the bank a shaft that met the side or back of the chamber, into

which I made an opening wide enough to admit my hand. This was closed between visits with a board or stone, and the shaft covered over. But no matter how slight the alterations I made, the motmots would invariably desert if I disturbed their burrow before the eggs had been laid and the incubation well begun. The *pájaro bobos* were by no means so obtuse as the name implies.

Burrows of the blue-throated green motmots, dug into the hard earthen banks of mountain roads passing through the oak forests, were exceedingly crooked, often with several twists or sharp turns where the birds bumped into unyielding roots or stones while they tunneled. In length they ranged from about five to six feet. To locate the end of one of these burrows in advance of digging was largely guesswork, and in preparing them for study I frequently uncovered, while groping for the back of the chamber, portions of the entrance tunnel, or even the nest-chamber itself. Then it became necessary to roof over the exposed parts with pieces of wood before I could fill in the earth above them. But each pair of these highland mot-

mots had been using their burrow as a dormitory for many months before I opened it in March, and had become so greatly attached to it that they did not desert in spite of my extensive remodelling alterations many times greater than would be tolerated by the turquoise-browed motmots, which dig their burrows in the spring just before they lay and do not use them as dormitories.

A pair of blue-diademed motmots, which used as the starting-point of their excavation what was probably the burrow of some mammal near the foot of a steep, rather bare slope covered with tall bushes, made a sharp turn, of about 45 degrees, about midway the length of their 65-inch-long tunnel. I have known this species to dig its burrow also in the vertical wall of clay, more than head-high, lifted from the ground by the root system of a great forest tree that had fallen in a windstorm. The blue-diademed motmots remain paired throughout the year, and may begin in October or November to dig the burrows, which they will use for breeding the following March. They do not, like the blue-throated green motmots, employ these burrows as dormitories; but the early beginning of excavation forms an approach to the system followed by the high- (Continued on page 100)

In Memory of John Muir, Naturalist

By ADELAIDE COKER

Today I saw a country I knew well;
But one that I had never truly seen.
A country where high mountains race pell-mell,
To pierce the vaulted sky that forms a screen
Between the planet Earth and Heaven's throne;
A country where the thund'rous waterfalls
Are heard forever, as an undertone
To symphonies of rain, wind, and bird calls.
Ah, yes, I saw this man's beloved mountains,
And listened to their songs from which his prose
Was written; but more, I saw the marble fountains
Of wisdom spraying Nature's fragrant rose:
And all because his keen unspotted sight
Led me within the arc of beauty's light.

MOTMOTS—DANDIES OF THE BIRD WORLD

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land species.

Motmots never line the enlarged chamber at the inner end of their long tunnel, but lay their eggs directly upon the bare earth, as kingfishers do. The short, blunt eggs are pure white. Turquoise-browed motmots lay sets of four, or sometimes only three eggs. Blue-throated green motmots produce sets of three, depositing them at intervals of two days; and three was the number of young in the single burrow of the blue-diademed motmot that I investigated. Since it is usually impossible to open the deeply placed burrows of this species without destroying them, I have not examined the contents of more than one.

Among motmots male and female share the task of incubation, sitting alternately, as with kingfishers. By day blue-throated green motmots sit from three to six hours at a stretch, and by night both male and female sleep with the eggs in the burrow, which had been their nightly bedroom for the preceding nine months or so. But with the lowland turquoise-browed motmot a single parent, presumably the female, sleeps with the eggs in the newly dug burrow. One exceptional burrow in the bank of the Río Morjá in Guatemala was so straight that with an electric torch I could look in at the mouth during the night and see the bird while she slumbered. The yellow artificial light so transformed her colors that at the first glimpse I was alarmed, supposing that some gray-furred animal had stolen into the burrow, devoured the motmot and her eggs, and now rested curled up in her place. But closer scrutiny revealed the bright band of turquoise on her brow, and reassured me that I in fact beheld the motmot sleeping peacefully on her eggs. Her head was inward, at the back of the chamber, and her long tail extended forward into the entrance-tube, with the blue-and-black racquets at the ends of the central feathers so far in front of the remainder of the bird that they seemed not to be attached to her, but rather to be isolated discs of feathers caught up in the ceiling. On subsequent nocturnal visits I always found the motmot sleeping in the same fashion, her head inward and her long tail running outward into the tunnel, where alone it found ample space without becoming bent. This was the secret of how the birds preserved their long racquet-feathers clean and unbroken during the course of incubation.

While sitting in the nest, motmots regurgitate the glittering shards of beetles and other indigestible parts of the insects and other creatures they have eaten, along with a few seeds, until a considerable amount of this material accumulates on the floor of the burrow. During the

many months when blue-throated green motmots occupy their burrows as dormitories, this refuse forms a thick, firmly compacted layer. An occupied motmot's burrow can always be distinguished by the sharpness of the two parallel ruts made along the floor of the tunnel as the birds shuffle in and out on their short legs. After the motmots finish nesting, their burrows are often claimed by swallows; then the two deep furrows are replaced by innumerable fine scratches made by the swallows' toes.

Blue-throated green motmots' eggs hatch after twenty-one or twenty-two days of incubation, which is also the period of the Amazon kingfisher. The birdlings hammer at the hard white shells for three or four days before they succeed in pushing off the blunt end and squirming out. Pink-skinned, with relatively huge lumps on the sides of the head representing future eyes, as innocent of feathers or down as the eggs from which they have just escaped, newly hatched motmots give no promise of future loveliness. At the time of their birth the devotion of the parents is at its highest pitch. When the burrow is opened at the rear, they merely retreat into the entrance tunnel, remaining there close to their little ones, although they might easily fly out through the front door. At this period I even lifted an unresisting blue-throated green motmot from above its nestlings. After examining both parent and little ones, I returned all to their chamber and closed up the back door.

Both parents feed and brood the nestlings but are unable to remove the rather liquid excreta, which soon befoul the chamber in the earth, just as with kingfishers. As the youngsters shuffle around on their hard nursery floor, their heels are protected from abrasion by little oval pads of thickened skin. Reared in the hot lowlands, nestling turquoise-browed motmots are at no stage of development covered with down; their horny feather-sheaths become quite long while still guarding the feathers tightly enclosed. When the youngsters are twelve days old they fairly bristle with these long "pin-feathers", which now at last break open at the ends and allow the plumage to expand. During the following week the youngsters become well feathered, but linger in their snug underground retreat until they can fly well. When at last they emerge, at the age of twenty-eight days or a little more, they closely resemble their parents in coloration, but still lack the long racquet-shaped tail feathers. Their beautiful plumage, bright and fresh, bears no stains from the foul, maggot-infested chamber where it unfolded in darkness. After the flight of the fledglings, this chamber is abandoned by both parents and young.

The development of the blue-throated green motmots in the cool highlands

follows a somewhat different course. At birth they are quite as naked as their lowland relations, but by their tenth or eleventh day they have become fluffy balls of dark-gray down and contrast sharply with the bristly, porcupine-like turquoise-browed motmots of the same age. During the latter part of their life in the nest, these downy gray feathers are gradually overlaid by green contour feathers that develop more tardily; the young blue-throated green motmots change color with no loss of plumage, and before they emerge from the nest also closely resemble their parents in coloration. Both of the old birds continue to sleep with the nestlings until these are about three weeks old, after which their behavior varies. In some families one or both parents abandon the burrow as a sleeping place during the last week that the nestlings remain in it, possibly driven to do so by the terrible din that the hungry, importunate youngsters set up as soon as they awake at the first peep of day. But in other families one or both parents pass the nights with the nestlings until the latter take wing at the age of twenty-nine to thirty-one days, when they are quite competent in flight.

Then the unexpected happens. The parents as a rule return at nightfall to sleep in the old, dirty burrows; but the youngsters, who hitherto have led such sheltered lives, are left exposed to the cold rains which now, at the end of May, fall almost every night. When the young motmots have been abroad a month or so, and can find at least a part of the food they need, the parents take advantage of a lull in the rains to dig a fresh, clean burrow, usually between one and ten yards distant from the one that has been their home for the last year, and where their children were reared. Here, if everything goes well, the pair will sleep huddled snugly together through the rainy months from July to October, and through the frosty months from November until the beginning of April, when they will lay their three white eggs and rear another brood. I am not sure when the youngsters mate and dig their burrows; but the available evidence suggests that it is at about the same time of the year when their parents excavate—that is, when they are about two months old.