ITS MANY-CHAMBERED NEST

BY ALEXANDER F. SKUTCH

As WE SPED ALONG the four-lane super-highway from Caracas to Valencia, we noticed great oblong masses of interlaced sticks hanging conspicuously from trees by the roadside and in the surrounding fields. "Those," said my companion and guide, Paul Schwartz, veteran photographer of South American birds and recorder of their voices, "those are nests of the bird you have come to Venezuela to study, the Rufous-fronted Thornbird." We saw scores of such nests, some even on service poles, before at last I glimpsed one of the little, wren-like, brown birds that build them. To study nests that are easier to find than the birds that make them would be a novel experience. Locating the nests of tropical birds, even of those that in one way or another make themselves conspicuous, is usually a difficult matter, involving much patient hunting through forests or thickets.

The Rufous-fronted Thornbird (*Phacellodomus rufifrons*) is a member of the Furnariidae or ovenbird family, whose 209 species inhabit South and Central America and tropical Mexico. Nearly all of these small or middle-sized passerine birds are clad in shades of brown, with occasional patches of warm chestnut or rufous to diversify their plain attire. But they compensate for their monotonous coloration by the exciting variety of their architecture; no family of birds has more diversified nidification. In Central America I had found nests of numerous species: great castles of sticks hidden in thickets; bulky globes of green moss hanging from trees and vines in the mountain forests; inverted pockets of moss skillfully fastened to mossy logs, or else smaller structures hidden in burrows in banks or holes in trees. Each of these nests was attended by a single pair of birds or, rarely, by a lone female. None of the Central American ovenbirds builds a prominently hanging structure of sticks that is the abode of a whole family, or perhaps of several families. Long ago I was fascinated by W. H. Hudson's too-brief accounts, in *Birds of La Plata*, of firewood gatherers and thornbirds whose great nests of sticks were apparently the permanent abode of the industrious birds that made them. Now, at last, I had come from Costa Rica to Venezuela to study the northernmost representative of this interesting group of ovenbirds.

Less than a week after our arrival in Venezuela, my wife and I were comfortably settled at "La Araguata," a large farm belonging to the bird artist Walter Arp, situated among the hills of the state of Carabobo, some 20 miles south of Valencia. On my first evening here I watched a bulky thornbirds' nest hanging from a tree in a fence line between pastures, close to the farm buildings. Nearby the Diesel engine that drove the electric generator was chugging noisily. Daylight, and my hope of finding this nest occupied, had all but died away when I heard repeated sharp *chips* coming from the weeds along the fence. Presently several thornbirds appeared, making their way through the low herbage toward the nest, undeterred by the engine's noise and pungent fumes or by my unconcealed presence. When near the nest they flew up to it, one after another, until I had counted six. They entered at

Rufous-fronted Thornbirds are plainly attired creatures but they compensate for dull coloration with an ability to construct many-chambered nests up to seven feet long and at tree heights of 12 to 50 feet.

least two of the rooms in the three-chambered structure, and when the last had vanished inside it was nearly dark.

The following morning, as it was growing light, I watched these six birds leave their dormitory. After flying down, they called a few times while travelling along the fence line toward the nearest thicket. Then, from amid low, dense vegetation along a neighboring stream, I heard their song, a rapid sequence of loud, ringing notes, all quite similar, except that sometimes the series ended with lower, mellower notes. In the weeks that followed, I came to love this simple performance, always so bright and animated, so suggestive of a cheerful nature. Often, especially while building their nest, the male and female duetted, standing side by side with bodies stretched up, bills pointing skyward, and downwardly directed tails beating time to their notes. Sometimes the song of one pair or family stimulated neighboring groups to raise their voices.

All day the thornbirds foraged, in pairs or family groups, through low thickets and weedy fields, where they were difficult to follow. Most of their food was gathered on the ground, where they hopped with feet together. Rather than flicking leaves aside in the manner of many ground-foraging birds, they pushed their heads under the litter to see what was there. Sometimes they quite vanished beneath dry fallen leaves, to reappear on the other side. They also investigated dead leaves caught up in bushes and vine-tangles, sometimes pulling out a leaf and dropping it. Like other ovenbirds, they subsisted largely, if not wholly, upon insects, their larvae and pupae, with an admixture of spiders and other invertebrates; I never saw them eat any fruit.

AFTER WATCHING the thornbirds make their way to the thicket where they foraged, I examined an old, fallen nest near the house. Composed of interlaced sticks, it was about 30 inches high by 10 to 14 inches wide, not including the ends of the sticks which stuck out far on all sides. It contained four more or less spherical chambers, placed one above the other in a single series, and separated from each other by partitions of sticks. The chambers did not intercommunicate, but each had its separate opening to the outside. The longest stick measured 21 inches. Those over 12 inches were numerous and ranged in thickness up to that of a lead pencil. Most of the sticks were fairly straight, but some were branched. At "La Araguata" there was abundant rainfall during the wet season, thus only a minority of the sticks used by the thornbirds were thorny. Doubtless in more arid regions, where the vegetation bristles with spines, the thornbirds gather enough thorny sticks to justify their name.

The fallen nest was an amazing construction for a bird only six inches long. Not the least surprising thing about it was the lining. In the four compartments I found scraps of cellophane, fragments of paper, bits of tinfoil, colored candy wrappers, and pieces of plastic bags up to six inches square, as well as feathers, narrow strips of fibrous bark, flakes of stiff bark, brown vegetable fibers, and chips of wood. Nests built farther from human habitations are lined chiefly with fibrous or papery materials from wild plants, curved rachises of compound leaves, and the like. Often they contain scraps of snakeskin. The Venezuelans say that the place to look for a lost love-letter is in the nest of "guaití," as the thornbird is called.

The four-chambered structure was a nest of moderate size. Newly-completed nests commonly contain two compartments, one above the other. The upper one may remain for a good while unfinished, with a loose covering of sticks; occasionally it is still uncovered when eggs are laid in the lower chamber. In other cases, the birds continue to build until they have started a third room above the second. Then, after a rest, they add new chambers from time to time. The limit of size seems to be set by what the usually slender supporting branch will bear. Sometimes the bough snaps under the growing weight, and sometimes an angle or sharp curvature makes further upward extension impracticable. It was doubtless no accident that the tallest nest we saw was attached to a long, slender, dangling vine that seemed to invite the thornbirds to build up and up. This inaccessible nest was estimated

to be seven feet high and to contain eight or nine chambers, with as many doorways, all facing the same way. Other shorter nests are more massive; one exceptional structure contained two compartments side by side in the top but only one below. Some thornbirds' nests are said to weigh hundreds of pounds.

ALTHOUGH thornbirds forage in thickets, they prefer their nest site in a tree standing in the open, in a pasture, a cultivated field, a dooryard, or beside a road. The tree may be separated from the nearest thicket by 50 yards of open ground, over which the birds fly rapidly when approaching or leaving their home. If no isolated tree is available, they build on the more exposed side of one growing at the edge of a woods or thicket. The slender, leafy branch chosen for the attachment of the structure may be horizontal or even upwardly inclined, but far more often it slants downward, and it may even hang vertically. As the weight of the nest increases, the branch sinks, and often the foliage drops off, so that the larger, older nests, which most often catch the attention of the hurried traveller, generally swing from vertically descending naked boughs, giving a false impression of the kind of site the thornbirds habitually choose. Most of the nests that I saw were from 12 to 50 feet up, the extremes being seven and about 75 feet. Since the structure is built around the branch, embedding it in the wall of sticks, it rarely falls unless the supporting branch breaks off or the sticks decay.

Often I watched the thornbirds build. Nearly always they worked in pairs, the two taking equal parts; sometimes a third bird gave much help, and occasionally there was a suggestion that a fourth was contributing. They built most actively early in the morning, after an interval for breakfast. Soon tiring of their arduous toil, by the middle of the morning they were ready to rest, but later in the day they built sporadically, and frequently they worked a little just before retiring in the evening. Although occasionally the birds tried to break twigs from trees, only small ones well advanced in decay yielded to their effort. Most of their sticks were gathered from the ground, seized, always singly, near the middle in the bird's slender bill. At times the builder flew directly up to the nest with its burden, but the heavier the piece, the more likely it was to hop and flit upward through neighboring shrubs and trees, showing great skill in maneuvering a stick two or three times its own length past obstructing branches. After attaining a point level with the nest or even above it, the bird flew across the intervening open space, sometimes with a load so heavy that it could hardly remain airborne. The thornbirds showed indomitable perseverance in carrying the sticks to their nest, often following to the ground one which fell and raising it again by a circuitous route.

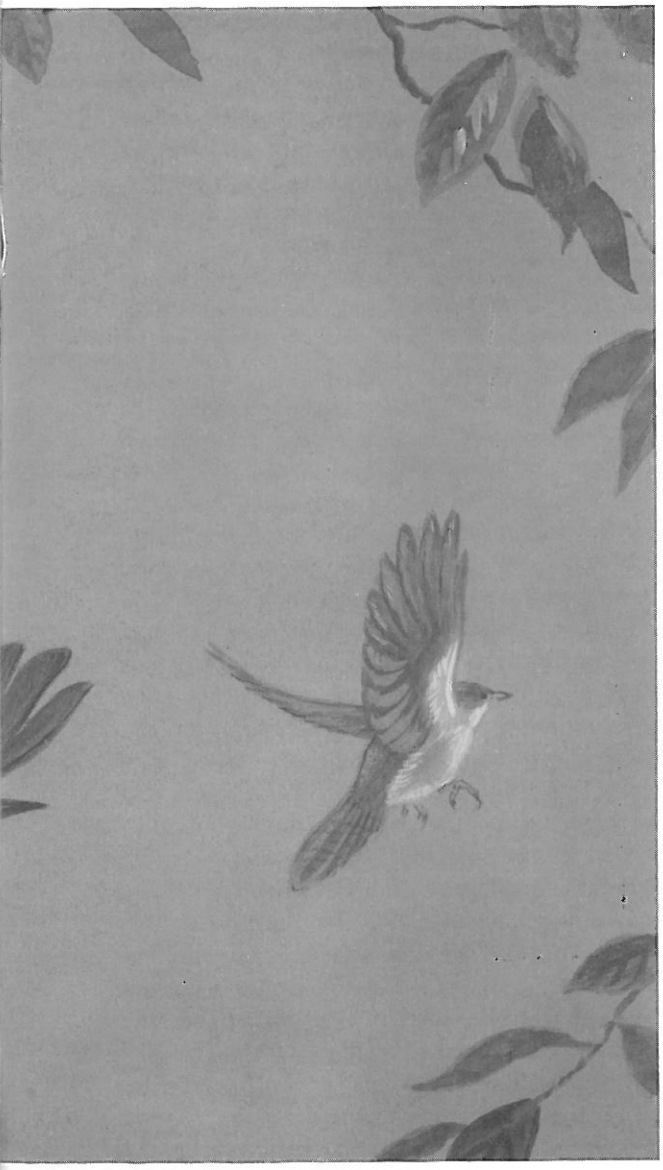
Reaching the growing nest with a stick, the builder held it with one end lower than the other and made sideward, apparently random movements with its head until the nether end slipped into a space between the other sticks. If the stick did not fit tightly, it might be pulled out and placed somewhere else. After depositing a new stick, the bird often tested a number of others, tucking in more firmly those that were loose. Even after the eggs were laid, the thornbirds continued to inspect their nest and push in falling sticks. Thus, by a simple technique, and without any cement of binding material, they made a fabric so strong that I could hardly open it with my fingers. To see the eggs or nestlings in the well-enclosed chamber, I forced a stout, pointed stick through the wall, making a hole large enough to insert a small electric bulb and mirror. After each visit of inspection, I closed the orifice.

Building thornbirds had no special time for lining their nests. If they found a feather or some other attractive material while their structure was still an open platform, they would deposit it there. While incubating their eggs, they brought much additional lining, and occasionally they brought a piece while feeding nestlings.

From March to May, before any nestlings had fledged, I made a census of the thornbirds' nests in the vicinity. In each of three nests, six grown birds slept nightly. One nest had five occupants, and in another I found sometimes four and sometimes five. There were

three nests with three sleepers. Fourteen nests, or 64 percent that I investigated, were inhabited by a single pair.

How did the larger groups of thornbirds arise? To answer this question, it was necessary to study their breeding habits. Although a number of flycatchers, tanagers, and other birds that gathered their food in the air or amid foliage nested at the height of the dry season in March and April, thornbirds, as is usual with ground-feeders, waited until the returning rains had soaked the ground litter and vitalized the small creatures that live in it, thereby providing an abundance of food for the nestlings. One pair established on low, damp ground was already feeding nestlings when the weather turned wet in mid-May, but most thornbirds delayed laying until late May or June. The few sets that I could reach consisted of three eggs, which were pure white, as is usual with ovenbirds. The eggs were nearly always laid in the lowest compartment, even when the nest contained newer chambers at the top.

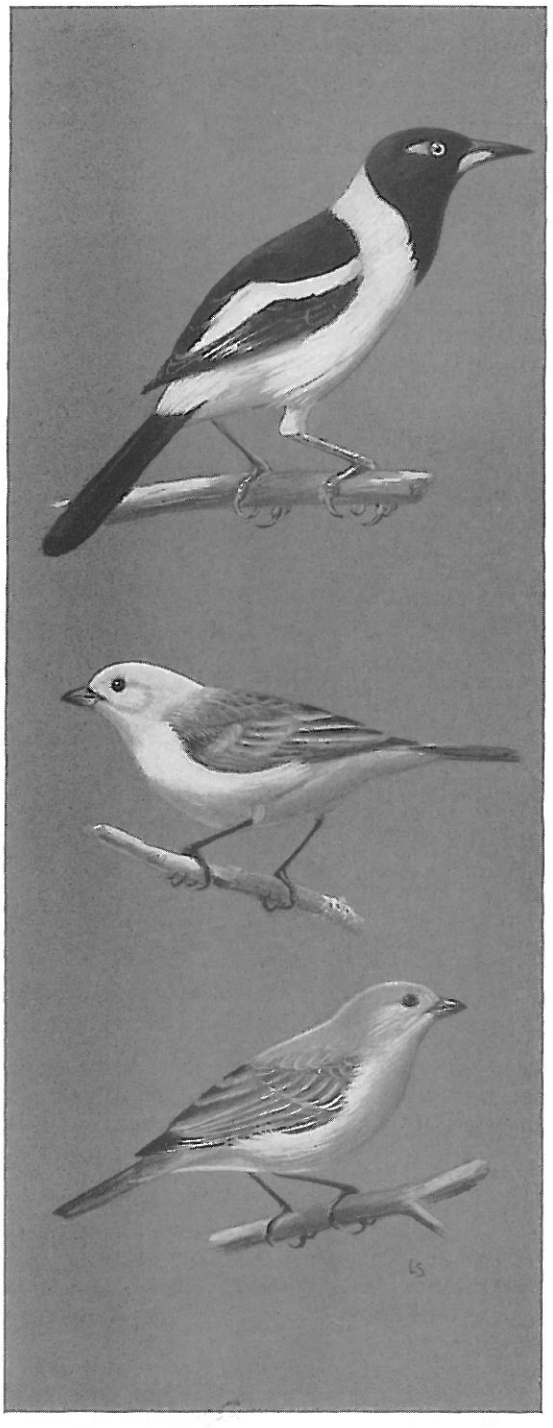


The Troupial—the black, white and orange oriole that is Venezuela's national bird—appears to be most injurious to thornbirds; tearing wider holes, it often will take over a thornbird nest for its own use.

One breeding pair consisted of a normal bird with a mate who remained quite tailless for four months. Since the sexes of thornbirds are not readily distinguishable, this provided an unusual opportunity to learn the parts each parent took in caring for the eggs and young. During incubation they replaced each other frequently, rarely sitting as long as 50 minutes at a stretch, but between them keeping their three eggs covered most of the time. As one relieved the other, they often joined in a duet, and while sitting in the nest, they sometimes sang loudly. Their eggs hatched after 16 or 17 days of incubation. As at other nests, the mated pair always slept together in the chamber with the eggs and nestlings.

Both parents brooded and fed the pink-skinned, sparsely-downy nestlings, bringing many small, brown pupae as well as green caterpillars, small grasshoppers and other insects, and occasionally a spider. On each parental visit only a single article was brought, held conspicuously in the tip of the bill. The parents worked hard, feeding three nestlings, about 12 days old, 255 times in the course of an active day of nearly 13 hours. Although the nestlings were fairly well feathered at this age, they remained in their swinging nursery another ten days. When finally they left, at the age of 21 or 22 days, they were as large as their parents and resembled them closely. On their very first flight they covered 100 feet with good control.

In the evening of the fledglings' first day in the open, the parents led them back to sleep in the nest. The young evidently continue to lodge with their parents until the following breeding season, or even longer. Since some pairs raise two broods in a season, a family group of seven or eight might grow up, if there were no losses. Thornbirds are so strongly territorial that two pairs and their descendants are not likely to occupy the same nest, even when it contains four or five rooms. When more than two grown birds sleep in a nest they are normally parents with their self-supporting offspring, but this is not the whole story. Thornbirds who have lost their nests sometimes seek admission to those of other families. Since the owners of these nests repulse them, they wait outside until it is nearly dark, then force their way in at a time when the resident birds probably cannot distinguish the intruders from members of their own family.



The Troupial (top) will evict a thornbird from its nest, while the Blue Tanager (middle) and the Sayaca Tanager (below) will take over an abandoned or partially abandoned thornbird nest for their own.

These interlopers are sometimes exceedingly persistent in their demand for a night's lodging. When a branch overladen by a large nest snapped off, the four tenants were left homeless. Two disappeared, but the mated pair promptly started a new nest in the same tree. While building, they had no roof to shelter them on rainy nights, so the nest of a neighboring pair was sought. One member of the homeless pair pushed in against strong opposition, after the moon and stars were shining brightly, but the other, more timid, preferred to sleep on the still roofless new nest. This continued for several nights, and the intruder developed a maneuver to meet the situation. When repulsed at the doorway, it turned its tail to the hostile birds inside, repeating this in the failing light until, it seemed, the ones within grew drowsy and permitted it to enter.

Nests so large and commodious as those of the thornbirds are coveted by less industrious birds of other kinds. Among those that have been found breeding in them are the Saffron Finch, Blue Tanager, Sayaca Tanager, Troupial, Piratic Flycatcher, and Firecrowned Flycatcher. Of all these birds, the Troupial — the melodious, black, white and orange oriole that is Venezuela's national bird — appears to be the most injurious to the thornbirds. Although most of the other secondary tenants of thornbirds' nests breed in them only occasionally and may be satisfied with old abandoned nests or dilapidated parts of nests, the Troupial regularly takes over wherever the two species occur together. Moreover, it demands a sound chamber, perhaps one still occupied by the thornbirds. Much larger than the builders, it cannot use their doorway but tears a wider opening in the side of the chamber, an undertaking for which its finely pointed bill seems far too delicate. While raising a single brood, a pair of Troupials stole three thornbird nests, one of which contained eggs and another nestlings. In one of these nests the female Troupial laid three eggs, after lining the chamber more adequately than the thornbirds had done. The other two stolen nests were used as dormitories by the adult Troupials, who always slept singly. Although thornbirds may continue to lodge in another chamber of a nest occupied

by Troupials, I doubt whether they could raise a brood so close to these aggressive intruders.

Many-chambered nests, occupied by a number of breeding pairs, are built by the Social Weaverbird of southern Africa, the Palm-Chat of Hispaniola, and the Gray-breasted Parakeet of southern South America. It was natural to assume that the large nests of thornbirds were also avian apartment houses, but this proved wrong; the territorial thornbird does not admit such close neighbors. Why, then, almost alone among the birds of the world, do single pairs build nests with two or more compartments? The answer is that the upper chamber sometimes serves as a bedroom for the older young while the parents attend eggs or nestlings; although the older offspring may try to join the parents in the brood chamber, they are at times violently repulsed.

The additional compartments may also make it more difficult for predators to find the eggs or nestlings. While incubating or attending young, the parents enter empty compartments with confusing frequency, so that often one must watch a long while to learn the exact location of the eggs or nestlings. Flightless mammals or reptiles, approaching along the supporting branch, come first to the usually upper chambers. Even if their failure to find anything edible here does not cause them to abandon the search, the delay may give feathered nestlings time to escape from the lowest compartment. And in the event of a night attack, such a delay might save the sleeping adults from being surprised and eaten. Nevertheless, many thornbirds lose eggs or nestlings to predators such as arboreal snakes slender enough to enter their nests without tearing open the wall.

But whatever practical advantages the nest with several chambers may have, I do not believe they provide the whole explanation of why the thornbirds construct them. In the ovenbird family, as among wrens, there is a strong tendency to build superfluously as a pastime or outlet for excess energy. In the Rufous-fronted Thornbird, as in certain related species, this propensity has reached its highest point.

Top-to-bottom—Piratic Flycatcher, Fire-crowned Flycatcher and Saffron Finch are among several species of birds that take over deserted thornbird nests for either temporary shelter or seasonal housekeeping.