



See whether you can see the rufous-breasted castlebuilder at its nest. The doorway to the nest is the round opening in the center of the pile of finer sticks in front of the bird. This doorway leads through a narrow tunnel to the nest-chamber at the left. Here rest the eggs and nestlings, protected from rain by the coarse thatch piled high above the chamber.

# The Castlebuilder

By ALEXANDER F. SKUTCH

OVER much of South America there is found a stout, long-legged, bright-brown bird slightly smaller than the meadow-lark. With mud or wet clay it laboriously builds, on the top of a fence post, or in the stout crotch of a tree at no great height, a substantial nest with a domed top and a round doorway in the side—a miniature of the clay baking oven of tropical countries. Hence the industrious builder is called *El Hornero* or “The Ovenbird”—a name to which it has far better right than the ovenbird of North America, a warbler whose nest, although oven-like in form, is built of materials that would not resist a fire.

The South American ovenbird has given its name to a large and exceedingly varied family of birds, the Furnariidae, abundant throughout South and Central America. Although in temperate South America they form one of the principal elements of the avifauna, strangely enough, members of the ovenbird family hardly pass north of the Tropic of Cancer, and are quite unknown in the United States. No other family of birds in the Western Hemisphere constructs such varied nests, nor those so large in relation to the size of the builders. Most, however, are made of sticks and other vegetable materials rather than of clay. Those who have fallen under the spell of that delightful book, W. H. Hudson's *Birds of La Plata*, will be familiar with many of these birds and their architec-

ture—treated, however, in the family Dendrocolaptidae, or Woodhewers, from which recent authorities have, with good reason, separated them.

One member of this engaging family that dwells farthest to the north is the rufous-breasted castlebuilder, *Synallaxis erythrothorax*, a bird the size of a small wood warbler. In the lowlands of southern Mexico, Guatemala and Honduras, one with ears attuned to such things often hears its frank, good-naturedly persistent *pet chu, pet pet pet pét chu* issuing from the depths of some low, second-growth thicket. But so dense and impenetrable by man is the vine-entangled vegetation amid which the author of these appealing notes lurks, that it may be long before the bird-watcher succeeds in catching a glimpse of the little, slate-colored bird with the ruddy breast and wing-coverts. Although retiring, the castlebuilder is not shy, and when foraging near the edge of the thicket will permit you to come near enough to note the finer details of its appearance—its sharp, wren-like, black bill, its red eye, the fine white streaks on its slate-colored throat, its pale-brown tail feathers frayed and worn by constant passage through dense vegetation. These tattered feathers have given the name spinetail to this bird, and to numerous relatives that live farther to the south; but they are not actually spinous-tipped like the tail feathers of woodpeckers and other climbing birds; and castlebuilder



seems to be a far more appropriate name for this bird.

In size, solidity of construction and complexity of form, the nest of the castlebuilder is to the nests of most other small birds as the towering castle of some medieval baron was to the surrounding huts and humble cottages of the common folk, his vassals. With the castlebuilders, building the nest appears to have become an obsession. Their great, elaborate castle of sticks occupies their unremitting attention during four or five months each year. Unlike nearly all other birds, they continue to add to it while incubating their eggs, and even while feeding their nestlings. So absorbed do they become in the work of building the nest that they continue to carry sticks to it while a person stands quietly in full view, hardly more than an arm's-length away. I have cut my way noisily through the bush-tangle in which they lived to within a yard of their nest without interrupting their building. While practically all other birds clearly build the nest merely as a receptacle for eggs and young, with the castlebuilders the construction of the nest appears to have become an end in itself.

In the humid Caribbean lowlands of Guatemala and Honduras, the castlebuilders lay the foundations of their huge edifices toward the end of March, or in early April. Their site is usually in a vine-draped bush or small tree, from six to twelve feet above the ground, but rarely as low as five, or as high as twenty feet. Their bulky structure requires the support of a stout, nearly horizontal limb with several lateral branches, or, better, of two or more branches that run parallel and close together.

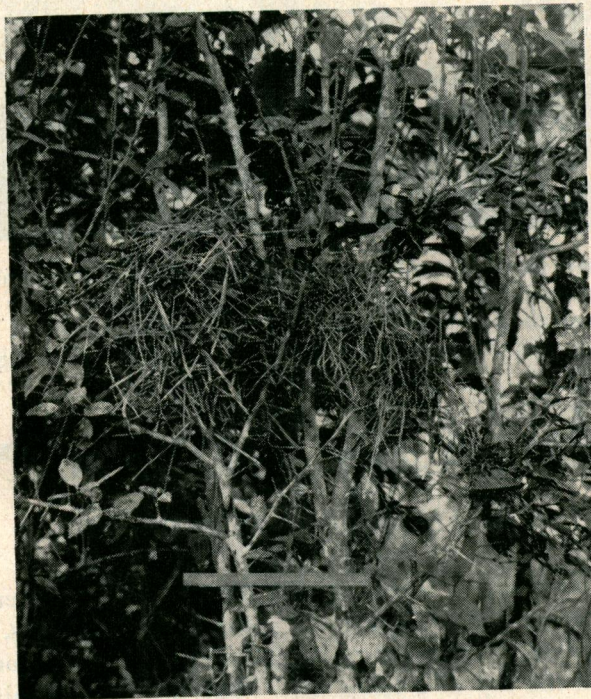
Male and female castlebuilders, which are alike in plumage and size, work together in closest harmony at the task of nest-building. Until the nest is far advanced, their material consists almost wholly of coarse sticks, which they gather on or near the ground. Some of these are as much as sixteen or seventeen inches in length and nearly as thick as a lead pencil. The heavier ones weigh from two to four grams. Such sticks are no slight burden for little birds that measure only five and one-half inches from the tip of the bill to the end of the tail, and it costs them much hard work to raise these twigs through the entangled vegetation and place them in the growing nest. Sometimes the castlebuilder, attempting to

fly up to its nest with a particularly heavy stick, grasped near the middle in its slender bill, is borne back to earth by the weight of its load; but it persists in its efforts until it gains a low branch in the tangle where the nest is situated. Then, by a series of short flights and hops from perch to perch, with much flitting of the wings to keep its balance, it gradually attains its goal, showing considerable skill in guiding its unwieldy burden between the close-set branches.

Arrived at the nest, the bird deposits its burden and industriously pushes and tugs until it fits securely in the desired position. Often, however, the stick is knocked from its bill by some unnoticed obstruction, or dropped because of sheer weight. Then the tireless little bird follows it to the ground, and undertakes anew the task of raising it by a circuitous route to the nest. Likewise, it descends to bring back sticks that fall from the nest while being arranged there. In this the castlebuilder differs from its relative the firewood-gatherer of Argentina, which, Hudson tells us, rarely tries to recover the material it has dropped on the way to its bulky nest, until at length enough fallen sticks to fill a barrow accumulate beneath the nest-tree.

The growing nest soon acquires the form of a bowl. At this stage it resembles, except for the absence of a lining, the structure that many a larger bird would find a satisfactory receptacle for its eggs

and its babies. But the castlebuilders have hardly begun their ambitious undertaking. As they continue to build, they extend the rim of the bowl on the side by which they habitually approach, until it forms a gangway over which they now carry their sticks. Elsewhere the birds build up the wall, at the same time contracting it toward the center, until the bowl is completely arched over with sticks. Simultaneously, they add sides to the gangway, and then begin to cover it over at the point where it joins the body of the nest, forming a tunnel. The nest at this stage is an oven-shaped structure entered through a spout-like projection from the side. The castlebuilders have now devoted nearly two weeks to their task, and already have a nest far bigger and better enclosed than that of any migratory northern bird, including those up to several times their size; but still their work is only half done. The tunnel is only partially covered



A nest of the sooty castlebuilder in western Panama. This simpler nest lacks the entrance chimney and is entered directly through the end of the tunnel at the extreme right. The ruler below is one foot long.



and must be provided with a roof out to the end.

To leave open the end of this tunnel, as does the sooty castlebuilder of southern Central America, would afford a method of entry into their stronghold far too direct for the rufous-breasted castlebuilders. As a further safeguard, like the winding entrance to some old Spanish fortress, they close off the end of the tunnel and build an entrance chimney above it. This consists of a circular pile, often a little tower, of twigs, which are usually thorny and are not only shorter but always much finer than those used elsewhere in the nest. Through the center of this pile the birds enter and leave their home. The entrance, and frequently the entire length of the tunnel, is surrounded by a broad platform of coarse sticks on which the castlebuilders can alight and walk around.

The nest-chamber, when first covered, has by no means a roof that will shed water, and the birds now devote much labor to supplying this deficiency. They fetch short, thick sticks, broad pieces of bark, weed stalks, dry petioles, and fragments of the leaf-bases of giant herbaceous plants—all material quite different

ers never consider it so, and continue to lavish their energies upon it until the eggs are laid, some five to seven weeks after the first sticks were placed. Even during incubation they continue to bring fresh material to it, increasing its bulk without essentially altering its form, until it becomes a monument to the tireless energy of the little builders, all out of proportion to their size. The final dimensions of the nest



A castlebuilders' nest viewed from above. At the right is the little tower of finer twigs through which the birds enter. At the left is the coarse thatch that diverts water from the nest-chamber. In the photograph at the left is a nest of the rufous-breasted castlebuilder in a thicket in Honduras. The chamber that contains the eggs is on the left, the entrance on the right.

depend, among other things, on the length of time it has been in use and the nature of the site. If the supporting branches form too narrow a foundation, there comes a time when much material brought by the birds falls from the sides of the nest, which then fails to grow as bulky as it might have done if the birds had chosen a more ample support. Thus there is considerable variation in the size of different nests. A fairly typical structure found in Honduras measured

twenty-nine inches in greatest length by nineteen inches in height at the large end, where the nest-chamber was situated. This chamber was between five and six inches in diameter, and the height from floor to ceiling four and three-fourths inches. Above the chamber the thatch was piled to a height of ten inches. The tunnel through which the chamber was



from that which forms the body of the nest—and heap it above the chamber to form an efficient thatch that will shed the rain. This material may at length form a pile rising eight or ten inches above the ceiling of the nest-chamber.

Almost a month may elapse before the wonderful structure appears completed, but its exacting build-



entered was fourteen inches long and one and one-half inches in inside diameter, and was surrounded by a platform eighteen inches in length by seventeen in width.

In May, the female lays four, or, less frequently, only three, delicate, roundish eggs, which may be either pure white, white with the faintest tinge of blue, or else a beautiful pale blue. The eggs in the same nest seem always to be of the same color, and sets of blue eggs are much less common than those of white eggs. When first laid they rest upon a few green leaves, hardly enough to prevent their touching the hard sticks of the chamber's floor. While incubation is in progress, fresh leaves are added daily, until at length the eggs repose upon an ample, soft lining, which becomes the bed of the nestlings.

As they shared the work of nest-building, so male and female divide the duty of incubation. They sit rather impatiently, rarely continuing on the eggs for more than three-quarters of an hour at a stretch. If the mate does not come to replace its partner after this interval, the latter may go off and leave the eggs unwarmed while it seeks food. But often the castlebuilder will return to relieve its mate after it has been incubating for only ten or fifteen minutes. Sometimes, without waiting to be relieved, the bird neglects the eggs in order to give attention to the nest itself.

It requires constant attention to keep in good repair a household so large and complex as that of the spinetails, and they do not stint the time they devote to it. To preserve the nest in shipshape condition they lavish a degree of care that suggests loving pride and is pleasant to behold. Before entering or after leaving the tunnel, they usually find time for a round of inspection, and almost always notice something that requires adjustment. A broad piece of bark has fallen from the roof to the entrance platform, and must be replaced in the thatch where it belongs; then sticks that are slipping down must be moved up into a secure position. Fresh leaves must be brought into the nest daily, and added to the bed beneath the eggs. For this purpose they always select soft, downy leaves, particularly those of a species of *Solanum* common in their haunts.

Not only do the castlebuilders find time for these routine matters of maintenance, but much besides for adding to their nest and even for providing it with luxuries. As with many a human couple who begin life together with only the resources provided by

their own labor, they start housekeeping with a minimum of comfort, and through frugality and industry gradually acquire the luxuries they desire at the same time as they bring up their family. It has already been mentioned that they constantly bring additional sticks to the nest both during the course of incubation and to a lesser degree while they attend the nestlings. But it is their unending search for the cast skins of snakes and lizards that occupies most of the time left free by the necessity to incubate the eggs and to find food. They seem never to have enough of this valued material; and the bird flying up to take its turn at incubation, if it does not bring

a stick or a green leaf, will very probably bear a fragment of reptile skin in its bill. This it may either stuff into a crevice on the outside of the nest or take inside. Some is carried to the nest-chamber, but most is employed to cover the bottom of the tunnel. One pair, whose nest I pulled apart after they had finished with it, had completely carpeted their front hall in this manner, from the doorway right up to the nursery.

The castlebuilders seem never satisfied to allow these precious skins to rest long in one place. They frequently

shift them from one position to another on the outside of the nest, or carry a piece from the exterior to the interior, or bring out a fragment that has hitherto reposed inside. When its spell of incubation is done a castlebuilder often emerges from the entrance chimney with a bit of skin in its bill, and deposits it somewhere on the outside before flying off to feed. This habit of bringing the exuviae of reptiles to the nest is shared by the sooty castlebuilder, the crested flycatcher and related species that breed in holes in trees, by a number of wrens that nest in cavities and crevices, and numerous other kinds of birds. But few, I imagine, search for this material with the same zeal as the rufous-breasted castlebuilders. Although one member of the pair who happens not to be incubating is chiefly concerned with the care of the nest and the search for reptile skins, frequently the birds will leave the eggs unwarmed for many minutes together while they indulge in these absorbing occupations.

The castlebuilders are among the very few birds that consistently and apparently intelligently repair a specific injury to their nest. The only way I could learn exactly what a nest contained was to separate the sticks at the back or side of the nest-chamber and peep or feel inside. In order to follow the course of incubation and the develop- (Continued on page 106)

## Rain-Window

By DANIEL SMYTHE

Here is a square of glass, washed over and over  
By rain from the sky: I can see it clearly limned  
With water; through a wavering line I can discover  
Grass on the hillsides, and the tree strong-limbed.

Here is a moving picture that the eye may gather—  
Shivering rain in the air, an earth that catches it all.  
Strange that I stand here, seeing a stormy weather  
Squared and held close by this opening in a wall.

Four fields beyond it, a hill, and threads of fences—  
A glass between, and the lashed drops guided back.  
But I can follow a cloud where the rain advances  
Beyond the square of a sill, to a hidden track.



## THE CASTLEBUILDER

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ment of the young, it was necessary to open the same nest repeatedly in this manner. After each examination, I pressed together the sticks I had parted and stuck additional pieces into the gap that always remained, but I was never able to obliterate entirely the evidence of my intrusion. The owners, on returning to the nest, would notice the alteration almost at once and fetch fine twigs to stuff into the chinks I had left, continuing this until one could not tell that the wall had been broken. The point where the breach had been made would occupy their attention for several days, and seemed to worry the birds even after it had been, to my eyes, perfectly mended. The birds often stuffed green leaves and fragments of reptile skin, which ordinarily were applied to other uses, between the twigs in the position of the break.

One day I purposely left a fair-sized gap in the side wall of a nest that sheltered two nestlings. The moment I moved away, one of the parents, who had been fidgeting around at a little distance, flew up bearing a stick, which it thrust into the breach. Then it continued with great industry to bring twig after twig to the gap, flying down again and again to recover those that had fallen beneath the nest, rather than go off to a distance for them. Meanwhile, the mate brought an insect to the hungry nestlings. Their domestic organization was perfect; neither bird was in the least flustered by my attempt at housebreaking, and neither uttered a sound. Each knew perfectly, without mutual consultation, what the situation required. When dusk was deepening into night, I returned and found one of the birds still working little twigs into the nearly obliterated gap, while the mate busied itself with arranging the sticks on the platform.

As nearly as I could determine, without unduly disturbing the routine of the nest by too frequent visits of inspection, the eggs must be incubated seventeen or eighteen days before they hatch. The newborn nestlings, typical passerine bird babies, are blind and helpless. Their light skin bears a scant, dusky down on the head, back and wings. The inside of their mouths is yellow. Both parents brood these nestlings and bring them small spiders, small insects and green caterpillars. Even the necessity of providing for four hungry mouths does not cause the adults to neglect their nest, and they still find time to keep it in good order, repair damages, and bring additional twigs. They make neither vocal protest nor feint of attack when their little ones are removed from the nest in their presence, doubtless because such demonstrations would be of little avail in the face of an enemy powerful enough to tear open

their castle. They continue calmly to feed their nestlings while a man watches them, unconcealed and only a few feet distant.

One might surmise that the nestling castlebuilders, growing up in the inner keep of a castle so cunningly designed and strongly constructed, would be exempt from the perils that exact so large a toll of young birds of most other kinds. But let a bird place her eggs where she will, swinging in a woven basket from the tip of a slender twig a hundred feet in the air, in a hole in the heart of a tree-trunk, buried beneath the ground, or in an intricately designed castle entered by a narrow passageway, there is ever some enemy that will discover her secret. The castlebuilders are not exempt from the heavy toll levied upon eggs and nestlings; and their nests are robbed with surprising frequency by some small, slender creatures, snakes or lizards or perhaps small rodents, which enter through the tunnel and take the eggs or young without making a breach in the wall. As with nests of other kinds, any interference by human beings, no matter how slight or how well intentioned, seems to increase their liability to destruction. Of the many that I watched, only in a single instance did the parents succeed in bringing forth a nestling into the world. As I opened the back of the chamber to look in, the young castlebuilder fled down the tunnel and escaped through the doorway. Then, fluttering to the ground, it hopped away through the short grass so rapidly that I succeeded in capturing it only after it had led me a merry chase for twenty feet. Fourteen or fifteen days of age, it was already well feathered, but differed from its parents in its tawny rather than rufous breast, and its brown instead of red eyes.

The structures that the castlebuilders erect with so much labor serve only for the one, or sometimes two, broods they rear in a single season. Once abandoned by their builders, the nests are often occupied by large, black ants, which swarm out in incredible numbers when the supporting branch is rudely shaken. If they escape the ants, termites may claim them and build a network of tunnels over and through them. Even should they remain free of these insect invaders, they are so weakened by decay during the long wet season that they are unfit for use a second year; and the hard-working castlebuilders must each spring build their nests afresh.

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## MAGNIFICENT ORION

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most of us prefer to do our star gazing. Early in May it disappears in the rays of the setting sun, appearing next in the early morning hours in late summer, and rising around midnight in November. At the equator Orion rises due east, passes