

EVOLUTION OF BIRDS' NESTS TRACED IN A NEW EXHIBIT

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CURATOR OF BIRDS

TO PUT them in their proper perspective in the animal kingdom, birds' nests are cradles for the eggs and, in many cases, nurseries for the young. They are comparable to the nest of leaves a squirrel makes in a tree top, the stone nest of a bass in a lake, and the elaborate nests of ants

eastern United States have been successfully made and used.

From species to species the nesting habits of present-day birds vary from the simple, approximating the reptile condition, to the very complex. In most cases it is possible to find connecting or intermediate types to form a series, which resembles the series of

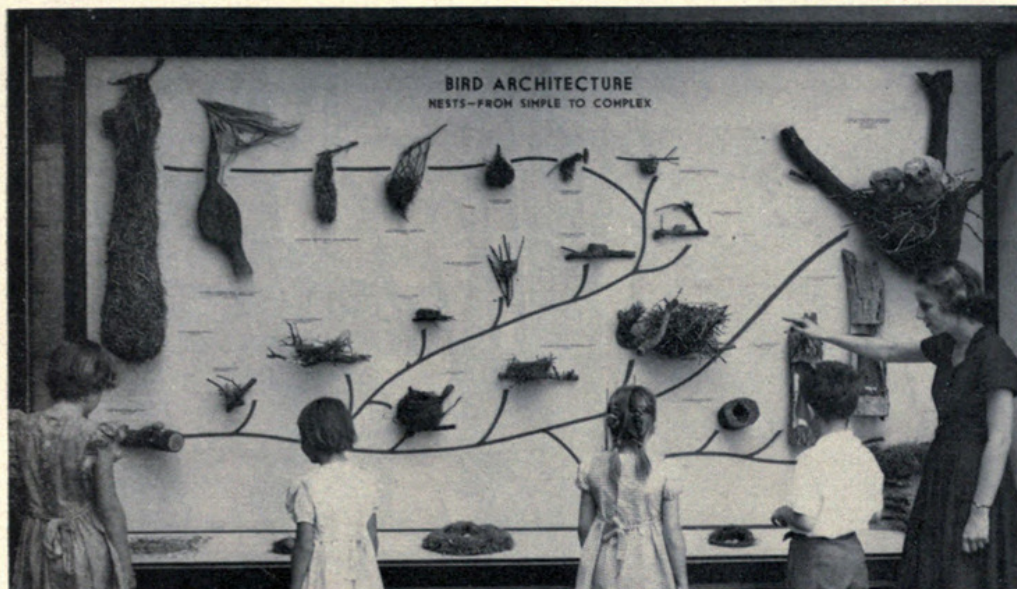
the bird sits on top of the sand covering the eggs to shade them and keep them cool.

Though here we have what seems close to the postulated original reptile-like method of nidification, it has cropped up in two quite distantly related birds, and we can't help thinking that it is a reversal to an earlier condition rather than a truly primitive one.

2. *No nest, or a rude nest:* Nighthawks of the United States and coursers of Africa are among the birds that lay their eggs directly on the ground without any preparation; murres and auks do the same on rocky ledges. It is but a step from this to the scanty hollows scratched out by many terns or shore birds and in which a few bits of shell, stones, or scraps of vegetation are added. Terns are often influenced by local conditions. If material is plentiful they may make quite a bulky nest, while if it is scarce they may be content with little more than a scraped-out hollow. Many birds, including pheasants, grouse, gulls, and loons, make only a crude nest on the ground. Some that may make their nests on the ground in one locality may in another make them in trees, like herring gulls and cormorants. Some other species that are ordinarily tree-nesting, like the robin, mourning dove, and osprey, may occasionally nest on the ground. It would seem that in addition to being a step on the way to a well-constructed ground nest, the rude ground nest also fits into the early part of the tree-nesting series.

Several modifications of nests seem to have reached their maximum development in this group: the nest with a blanket of eiderdown provided by the material plucked from the bird's own breast and the truncate cone of mud, with a hollow in the top for the eggs, made by flamingoes. The habit of birds that make burrows in the earth for their eggs but provide little or no nest material for the eggs to rest on during incubation, such as some petrels, kingfishers, penguins, burrowing owls, motmots, and bee eaters, might be considered an offshoot of this primitive ground nesting, though undoubtedly it arose independently many times.

3. *Advanced ground nests:* The well-made cup nest set into a hollow scratched in the ground and with walls raised more or less



BIRD ARCHITECTURE

Miss Jane Sharpe, of the Raymond Foundation staff, points out to a group of young Museum visitors the new bird's-nest exhibit in Hall 21. Nests arranged in series from simple to complex show stages in nest building.

and wasps. The basic plan for a nest, as one would expect, is a saucer- or cup-shaped hollow or structure, but the variations on this theme are great, from a depression scratched in the ground to a cup of fiber slung in a globular covering in the top of a tree where it forms part of a community structure.

As birds evolved from reptiles, a point on which we have fossil evidence, so did the elaborate nest-building of birds evolve from simple kinds, and simple nest-building from such early beginnings as the reptile's habit of burying its eggs in the earth, though on this point we have no fossil evidence. When birds became warm-blooded and the eggs needed incubation, nests became necessary, and the warm-blooded condition and nest building probably developed together. And as birds occupied many habitats—the water, the ground, the trees, and the air—their nests, from species to species, became distributed through as many different sorts of places as was practical.

SITES AND TYPES VARY

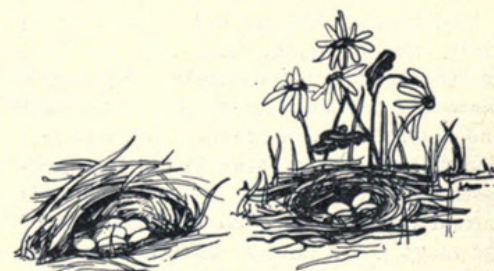
Some birds exhibit great variation in their choice of a nest site and in the type of nest built, but most kinds of birds build a particular type of nest, in a typical way and in a typical place. So true is this that keys to the identification of birds' nests in the

stages through which one would have expected birds' nests to evolve. It is this aspect of birds' nests that is shown, in part, in a new exhibit in the Bird Hall (Hall 21). Here we are dealing not with a structure but with the concrete product of a pattern of behavior.

We shall now take these up in the order of simple to complex.

EGGS LAID IN OR ON THE GROUND

1. *Buried in the ground:* The mound builders of the Malaya-Australian area, which are relatives of the domestic fowl, bury their eggs in the ground or in a mound of surface litter they scrape up in the forest (whence their name). There they leave their eggs to incubate by the heat of the soil, sometimes due to vulcanism, sometimes due to the rotting of the vegetable matter in the soil. The young are so well developed at hatching that they get along without a parent's care. Scarcely less extraordinary for a bird is the manner in which the Egyptian plover or courser, perhaps better known as the crocodile bird, buries its eggs in the sand, leaving no trace of where they are buried, and then squats on top of the sand above the site of the buried eggs. During the day, at least, the sand may be burning hot, and it has been suggested that

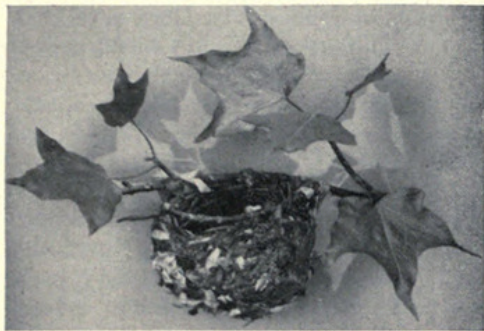


GROUND NESTS

The meadow lark makes a domed nest (left) on the ground and the bobolink an open cup (right).

above ground level is a common type with song birds, such as larks and vesper sparrows. A specialization in this type that seems to be an end product, perhaps an ancestral trait retained, is that of larks sometimes placing pebbles as paving stones in front of their nests. The domed nest of the meadow lark and the oven-bird warbler are logical outcomes of providing protection over the nest in the form of a roof. Other species, such as the junco and the Townsend solitaire, may get protection from above by sometimes placing their nests under projecting banks, and from this it is but a step to the rough-winged swallow that may nest deep in some ready-made burrow.

As we have mentioned earlier, birds that ordinarily nest in trees may sometimes nest on the ground, like the robin, and the low-nesting song sparrow may build its cup-shaped nest either on the ground or in a



CUP NEST

All the members of the family Vireonidae (vireos) make a similar nest—a neat cup slung by its edges.

bush. It is probable there has been considerable exchange from tree to ground nesting by birds, as there still is.

TREE NESTS

4. *Simple nests:* The classical example of simple nest is that of the fairy tern, which may lay its single egg on the naked branch of a tree, depending on irregularities in the bark to hold the egg safe. But the few crossed twigs of fruit-pigeons' nests, the scant platform of twigs of a frogmouth, and the doves' nests on palm leaves or the shelves of ferns growing from the sides of trees are little advances in nest building. Many heron and ibis nests are little but flattened bundles of sticks, and the nest of the yellow-billed cuckoo is the same.

The typical cup we find in many song birds: the robin, grackle, and cardinal. In these we find differentiation of material, coarse material forming the shell of the nest and finer material the lining. In one direction this reaches its peak in the big stick-nests of hawks, eagles, and crows and is carried beyond to the domed stick-nest of the magpie. In another direction we have the neat structures of fine material, like those of some warblers, the goldfinch, hummingbird, and wood peewee, some of which may have the outside bound together

with animal silk. These form a progression toward the slung cup of the vireo, the semi-pensile nest of the kinglet, and the deep purse of the cassiques and oropendolas that are hung by having the rim about the entrance wrapped around the supporting twigs.

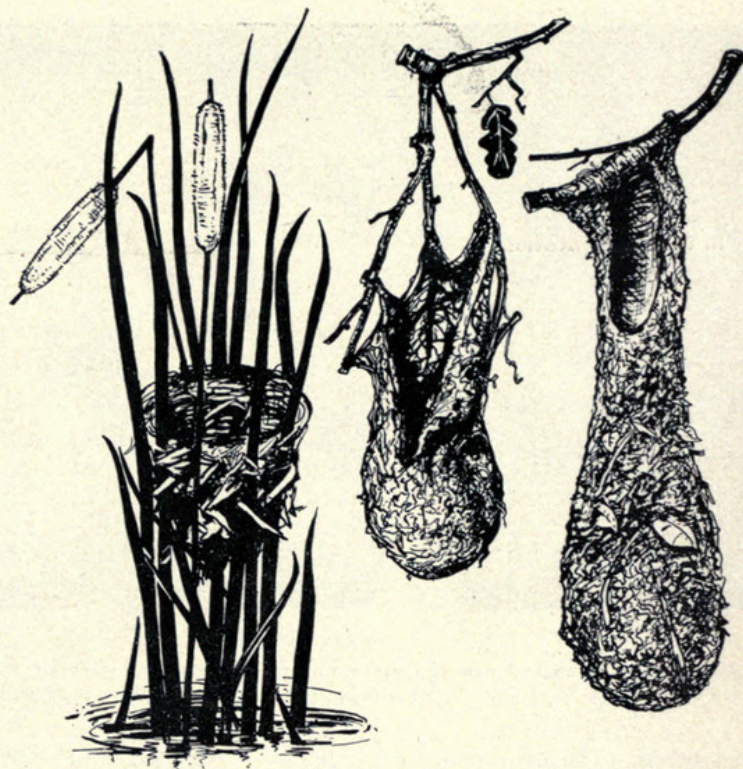
The next step is the globular nest or a retort-shaped nest with an entrance in the side, which is hung from a special strand that allows it to swing free. Though the nests of weaver birds and sunbirds are thus placed near the top of the pendant series, they also recall the domed nest of the marsh wren supported by reeds on all sides and the retort-shaped nests of some weaver birds that are placed among branches. The sociable weaver bird carries the theme of a pendant nest still further—the colony constructs a big roof in a tree top and all the birds in the colony make their retort-shaped nests under it.

We have not mentioned yet the arboreal birds that make their nests in any cranny or crevice, like the house wren, or that customarily nest in a hollow in a tree, like the barred owl, the mountain bluebird, and the tree swallow. The woodpeckers and some parrots and trogons stand apart as birds that chisel or chew their own tunnels into solid wood and lay their eggs on the bare wood or the scattered chips left there. They are the arboreal counterparts of the subterranean burrowers, the kingfishers, petrels, and burrowing owl.

We have sketched some of the outstanding types of variation in nesting, some of which are illustrated in the new exhibit. These have been arranged into series showing "relationship" in construction, form, and placement. These series probably do illustrate actual stages through which birds' nests evolved, but the series very definitely do not show blood relationships. The petrels, the kingfishers, the bank swallows, and the owls, which all burrow, have little else in common. Rather than blood relationships these series perhaps indicate how adaptable are birds and how they have changed their nesting habits to utilize the many ecological niches that were available.

This exhibit far from exhausts the subject of nests. When gathering together material

on this exhibit, a list of headings was drawn up. The list included such entries as multiple nests, communal nests, symbiotic nesting, social parasitism, cock nests, uses of nests, nests placed near other animals, spacing of nests, nest construction, size of nest versus size of bird, nest sites, nest materials, unusual nests, and changes brought about by civilization. Some of these items will be taken up in a companion



VARIETY OF NESTS IN FAMILY

Members of the family Icteridae (blackbirds, grackles, orioles, etc.) make a wide variety of nests depending on the species. Those shown above are (left to right): a cup in vegetation (red-winged blackbird), a pensile purse-shaped nest in tree (Baltimore oriole), and a very deep pensile purse in tree (oropendola). See accompanying sketch for nests of meadow lark and bobolink.

screen to be placed on the other side of Hall 21.

ANOTHER AUDUBON LECTURE

The second lecture in the series being presented at the Museum by the Illinois Audubon Society will be "Alluring Alaska," by Father George M. Link on Monday evening, November 28 at 8. It will be given in the James Simpson Theatre of the Museum, and doors will be opened at 7:30. This is a timely film-program featuring wild-life of the Alaska wilderness—including unusual sequences of wolves, bear and deer among majestic mountains, wilderness forests and flower-filled meadows, all in full color.

Visiting Hours Change

Museum hours, which have been 9 A.M. to 5 P.M. in the autumn, change to the winter schedule—9 A.M. to 4 P.M., November 1 to February 28.



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