



AMERICAN MUSEUM OF NATURAL HISTORY

THE HABITAT GROUPS  
OF  
NORTH AMERICAN BIRDS

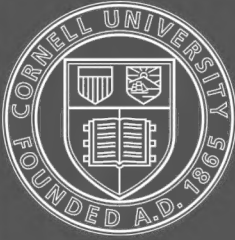


By FRANK M. CHAPMAN

CURATOR OF ORNITHOLOGY

GUIDE LEAFLET No. 28 SECOND EDITION





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FLAMINGOES AND YOUNG

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One of many studies made by Dr. Chapman for the Flamingo Group

THE HABITAT GROUPS  
OF  
NORTH AMERICAN BIRDS

IN THE  
AMERICAN MUSEUM OF NATURAL HISTORY

By FRANK M. CHAPMAN  
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GUIDE LEAFLET SERIES No. 28

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SECOND EDITION, REVISED AND ENLARGED



CAMP AT PTARMIGAN PASS, CANADIAN ROCKIES



THE HABITAT GROUPS OF NORTH AMERICAN BIRDS  
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BY FRANK M. CHAPMAN

Curator of Ornithology

THESE groups of birds are designed to illustrate not only the habits but also the haunts or "habitats" of the species shown. Each group usually includes the nest, eggs and young, besides the adult bird or birds, with a reproduction of from 60 to 160 square feet of the nest's immediate surroundings. To this accurate and realistic representation of the home of the species is added a painting from nature of its habitat, the real foreground being connected with the painted background in such a manner that one often does not at first see where the former ends and the latter begins. The whole, therefore, gives an adequate conception of the nature of the country the birds inhabit and the conditions under which they live.

It should be clearly understood that these backgrounds are not more or less fanciful sketches of the haunts of the birds associated with them, but they are careful studies from nature of definite localities, and therefore possess a geographical as well as an ornithological value. When selecting subjects for treatment, an effort was made to include the birds of widely diversified types of country, in order that the series, as a whole, should portray not only the habitats of certain American birds, but America as well. From the Bahamas to Hudson Bay, from the Atlantic to the Pacific, localities are represented which show at least the more characteristic phases of our landscape, and it is hoped that a tour through this hall of Habitat Groups will not only yield information in regard to North American birds, but also give one some conception of the appearance of the land in which they live.

Some subjects were in nearby places and were easily visited; others were in remote regions and were reached with more or less difficulty.<sup>1</sup> It is estimated that about 75,000 miles have been traveled to secure the material on which the groups are based.

<sup>1</sup> The narrative of many of these expeditions is contained in "Camps and Cruises of an Ornithologist," by Frank M. Chapman.

Each group in the series, beginning with Bird Rock in the Gulf of St. Lawrence, in 1898, is the result of a special Museum expedition in charge of the Curator of Ornithology, usually accompanied by a preparator, and one of the artists whose names appear in connection with the backgrounds they have painted.

After arriving, before securing specimens, the birds were first studied and photographed at short range from an especially constructed umbrella-blind. This was sometimes placed in the very heart of the bird community, as, for instance, with the Flamingoes and Pelicans; or even in the tree-tops as with the Egrets. At the same time the artist made studies on which to base the final background, as well as detailed color sketches of leaf and blossom, while the preparator collected the needed accessories, making casts or preserving vegetation in various solutions as occasion required. When the field-work was concluded, the crates of branches, carefully packed boxes of foliage, nests, birds and photographic plates, sacks of earth and other material, according to the nature of the subject, were shipped to the Museum, subsequently to be prepared in the laboratories.

The vegetation, by Mr. J. D. Figgins, Mr. A. E. Butler and other members of the Department of Preparation, has been reproduced in wax, either from plaster molds of the original, or by careful duplication of the original itself. The color has been applied with an air-brush or atomizer, by which the most delicate tints and textures are faithfully rendered.

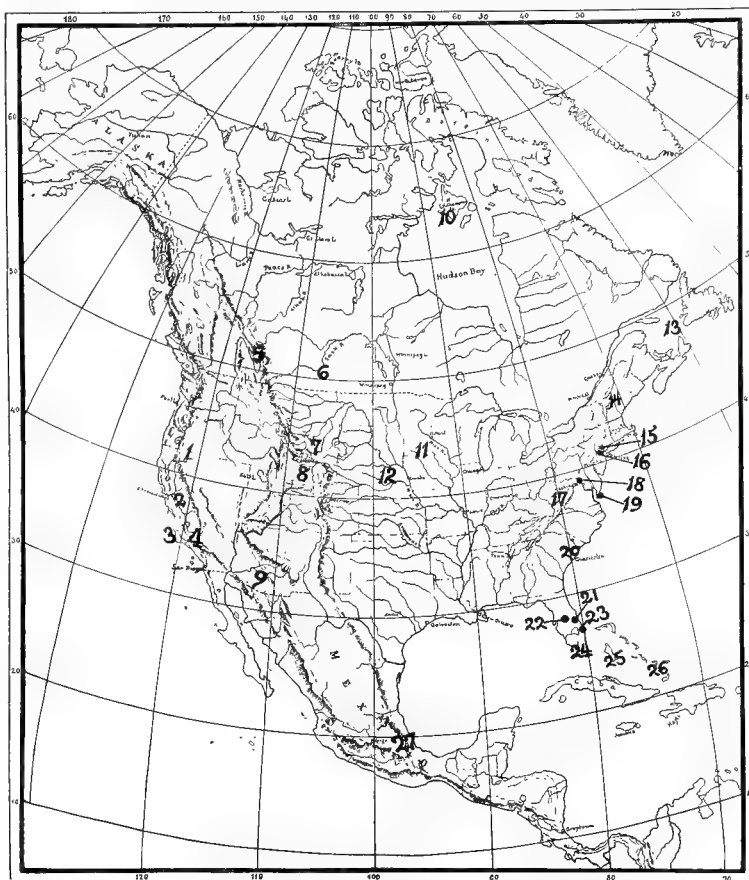
Each group has demanded its own special treatment, and, in the construction of the series, the many novel problems encountered have resulted in the development of original methods. This is particularly true of the manner of installation and illumination of the groups at the sides of the hall. Here, it will be observed, the background is curved, with the front opening so reduced in size that at the proper distance, or "correct viewpoint," neither the ends nor the top of the group can be seen. By thus leaving the actual limits of the group to the imagination, the illusion of space and distance is greatly heightened.

The groups are illuminated from above by diffused light; electric light being employed when daylight fails, but, in either case, the rays strike the group from the same diffusing surface.

The Museum owes this series of Bird Groups primarily to the generosity of a number of its members, without whose contributions the collection and preparation of the material would not have been undertaken.

For this valuable coöperation the Museum is indebted chiefly to Mr. John L. Cadwalader and to Mrs. Morris K. Jesup, Mrs. Philip

Schuyler, Mrs. John B. Trevor, Mrs. Robert Winthrop, Mr. F. Augustus Schermerhorn, Mr. H. B. Hollins, Mr. Henry Clay Pierce, Mr. Henry W. Poor, Mr. Courtenay Brandreth, and Mr. James C. Carter.



MAP INDICATING LOCALITIES REPRESENTED BY THE GROUJPS

- |   |  |
|---|--|
| 1. Klamath Lake, Oregon-California boundary                       | 15. Duck Hawk, Palisades at Englewood N. J.                        |
| 2. San Joaquin Valley, California                                 | 16. Hackensack Meadows, N. J.                                      |
| 3. Brandt's Cormorant, Monterey, California                       | 17. Wild Turkey, mountains of West Virginia                        |
| 4. California Condor, Piru Cañon, California                      | 18. Turkey Vulture, Plummer's Island, near Washington, D. C.       |
| 5. Ptarmigan Lakes, Alberta                                       | 19. Cobb's Island, Virginia  |
| 6. Canada Goose and Grebes (two groups), Crane Lake, Saskatchewan | 20. American Egret, near Charleston, South Carolina                |
| 7. Golden Eagle, Bates's Hole, Wyoming                            | 21. Brown Pelican, Indian River, Florida                           |
| 8. Sage Grouse, Medicine Bow, Wyoming                             | 22. Sandhill Crane, Kissimmee Prairies, Florida                    |
| 9. Cactus Desert, Tucson, Arizona                                 | 23. Anhinga and Ward's Heron (two groups), near St. Lucie, Florida |
| 10. Whistling Swan, Southampton Island, Hudson Bay                | 24. Cuthbert Rookery, Florida                                      |
| 11. Whooping Crane, Heron Lake, Minnesota                         | 25. Flamingo, Bahamas  |
| 12. Prairie Hen, Halsey, Nebraska                                 | 26. Booby and Man-o'-war-bird, Cay Verde, Bahamas                  |
| 13. Bird Rock, Magdalen Islands, Gulf of St. Lawrence             | 27. Mount Orizaba, Vera Cruz, Mexico                               |
| 14. Loon, Lake Umbagog, New Hampshire-Maine boundary              |  |



BIRD ROCK

The First of the Habitat Bird Groups in the American Museum



KEY TO THE BIRD ROCK GROUP

- 1. Common Murre.
- 2. Brünnich's Murre.
- 3. Razor-billed Auk.
- 4. Kittiwake Gull.
- 5. Gannet.
- 6. Puffin.
- 7. Leach's Petrel.

## THE BIRD ROCK GROUP

### A STUDY OF AN ISLAND COLONY

To the preserving influence of island-life we owe the continued existence of many birds that have long ceased to live, or, at least, to nest, on the mainland. In every instance, however, whether the island be a thousand square miles or one square foot (as a Grebe's floating nest) in extent, it owes the preservation of its bird-life to the same cause—the entire or comparative absence of bird enemies, terrestrial mammals in particular.

Bird Rock, with its neighbor, Little Bird Rock, belongs to the Magdalen Group in the Gulf of St. Lawrence. It is 351 yards long, from 50 to 140 yards wide, and rises abruptly from the sea to a height of from 80 to 140 feet. Its vertical rocky walls are weathered into innumerable ridges, shelves and crevices—fit sites for the nests of the sea-birds that for centuries have made the Rock their home. The birds, furthermore, have found an abundance of food (chiefly fish), in the surrounding waters.

The Bird Rock was not definitely planned as a "habitat group," but rather as a picture of part of a famous and impressive bird colony and a permanent record of a characteristic phase of island-life and, owing to circumstances, it was not even installed as originally planned.

The material for the group was collected in July, 1898, and for many years the group marked the highest point reached in the presentation of bird-life. The group includes examples of the various species that breed—one can hardly say nest—on the rock, the most noteworthy and noticeable being the great white Gannets. Then come the Murres, Razorbills and Puffins, the graceful Kittiwake, and, last and least, Leach's Petrel, seldom seen because it nests in little burrows like rat-holes and comes and goes at night.

The Bird Rocks are of interest alike to naturalist and historian, for their story begins with the discovery of these little islets by Jacques Cartier in June, 1534. He records his visit as follows: "These islands were as full of birds as any meadow is of grass, which there do make their nests, and in the greatest of them there was a great and infinite number of that that we called Margaulx that are white and bigger than any geese, which were severed in one part. In the other were only Godetz and Great Apponatz, like to those of that island that we above have mentioned. We went down to the lowest part of the least islands, where we killed above a thousand of those Godetz and Apponatz. We put into our boats as many as we pleased, for in less than an hour we might have filled thirty such boats of them. We named them the islands of the Margaulx."

Three centuries later, Audubon, whose energy in exploration no ornithologist has ever surpassed, visited this colony and was duly impressed with its wonders, though the freshening wind prevented him from landing on the rock itself.

Then evil days fell upon this bird metropolis; fishermen commenced to visit it to obtain birds and eggs for food and to obtain birds for bait; then a lighthouse was erected and, within ten years, the Gannet population of 100,000, which, seen from a distance, had caused Audubon to think that this rock was covered with snow, was swept from the top of the rock. To-day, though still one of the ornithological wonders of our Atlantic coast, the colony is but a shadow of its former self, and unless more effective protection is given than now prevails, in time only a fraction of even the present numbers will be left.



BIRD ROCK FROM THE SOUTHWEST  
Distance about one-half a mile

(From "Bird Studies with a Camera," by permission of D. Appleton & Co.)



THE ORIZABA GROUP

The observer is looking across the valley of the Rio Blanca, over the tropical forest, to Mount Orizaba  
Background by Bruce Horsfall. Birds by Harry Raven and Walter Escherich.



## THE ORIZABA GROUP

### A STUDY OF THE INFLUENCE OF ALTITUDE ON THE DISTRIBUTION OF LIFE

**F**ROM the dense tropical forests, at the base of Mount Orizaba in Vera Cruz, one may look upward toward the equally grand forests of pines and spruces which, 10,000 feet higher, cover the sides of the mountain.

In the luxuriant vegetation about one are Parrots, Toucans, Trogons, Motmots, and many other tropical birds; and from their home one may see the zone where Crossbills, Evening Grosbeaks, Juncos, Brown Creepers, and other boreal birds are nesting. Owing to differences in altitude, which are the equivalent of differences in latitude, the three great Life Zones which go to make up the faunal regions of North America are thus represented in this one group, which may be said to epitomize all the other groups contained in this hall.

The studies for this view of Mount Orizaba were made at Cordova (altitude 3,500 feet), at the upper border of the Tropical Zone. The primeval tropical forest having long since been cut off in this region, it was necessary to descend to a level of about 1,000 feet, near Motzorongo, to secure studies for the forest depicted. The accompanying view of the Rio Blanca was also made near this point, from which Mount Orizaba may be seen in the same relation in which it is here painted.

The birds contained in this group are representative species of the tropical portions of the State of Vera Cruz. They have been selected to show the tropical character of the bird-life of this region, rather than the bird-life of any particular part of it; and represent but a small part of the avifauna of several hundred species.



A GLIMPSE OF COBB'S ISLAND

Background by Walter Cox. Birds by H. C. Denslow.

## SUMMER BIRD-LIFE OF COBB'S ISLAND, VIRGINIA

**A** SHELL-STREWN sand-bar seven miles long and about the same distance from the mainland, Cobb's Island, off eastern Virginia, is an ideal resort for sea-birds. Here they are beyond the reach of most bird enemies, while the surrounding waters furnish an unfailing supply of food. The home of the birds has little or no value as "real estate"; they themselves are unfit for food, and it might have been supposed that their continued existence was assured. But about twenty-five years ago they suddenly acquired a commercial value. Their plumage became fashionable for millinery purposes. As a result, thousands of birds were slaughtered on their nesting-grounds, and within a few seasons some of the most abundant species were practically exterminated.

At no place were more birds killed than on Cobb's Island and the islands immediately adjoining it. In a single day, 1,200 Least Terns were shot on Cobb's Island; in three days three baymen killed 2,800 Terns in the same locality; at the end of two seasons the Least Terns, for which there was especial demand, no longer existed in this region, and the Common Terns were greatly reduced in numbers. Fortunately the State of Virginia passed a law prohibiting the killing of these birds, and for several years the National Association of Audubon Societies provided a warden to enforce this law during the nesting season.

In response to this protection the birds began increasing in numbers, and in time may become as abundant as they formerly were. The Least Terns have not reappeared, there being no stock to begin with, but the Common Terns are yearly becoming more numerous, several hundred pairs having nested on the island even in the summer of 1902.

Besides the Common Terns, Skimmers, Gull-billed Terns, Oystercatchers and Wilson's Plovers now nest on the beach of Cobb's Island; while in the marshes which flank the beach on the bay, or west side, numerous Laughing Gulls, a few Forster's Terns and many Clapper Rails, or Marsh Hens, make their nests.



THE DUCK HAWK ON THE PALISADES  
Background by Hobart Nichols. Birds by John Rowley.

## THE DUCK HAWK ON THE PALISADES

**T**HE Duck Hawk is the American representative of the Old World Peregrine Falcon, from which it differs but slightly in color and not at all in general habits.

By falconers the Peregrine was esteemed only second to the Arctic Gyrfalcons. The latter could be owned and flown only by members of the royal family, while no one of lower rank than an earl was permitted to use a Peregrine.

Possibly the restrictions imposed on the owning of Gyrfalcons arose rather from the difficulty with which the birds were obtained than from their superiority as hunters. In this respect the Peregrine, or Duck Hawk, is probably not excelled by any other bird of prey. Its speed enables it to overhaul with ease the swiftest-flying ducks, while it has sufficient strength to strike and kill them in the air and bear them away without visible effort.

The Duck Hawk is fearless in pursuit of its prey and will dash down and capture a wounded bird within reach of the sportsman's arm; and will repeat the attempt even if fired at and missed.

Peregrines in slightly varying forms are found throughout the greater part of the world. The Duck Hawk, the American form, breeds locally throughout most of the United States, and migrates as far south as Chile. When migrating, it is sometimes not uncommon along our coasts, since it travels with the flocks of wild fowl on which it preys, but when nesting it is generally rare.

In the vicinity of New York City the Duck Hawk is known to nest only on the Palisades of the Hudson, where they are unfortunately molested by egg-collectors, and among the hills and mountains to the northward. It is believed that, in the spring of 1908, three pairs were nesting on the Palisades.

In this region Duck Hawks begin to lay in March. They build no nest, but lay their eggs, as may be observed, on the bare rock.

The material for the present group was collected by R. B. Potter on Hook Mountain, near Nyaack, N. Y., but it is here shown against a background representing the Palisades, northward from the "Gorge" at Englewood.



AUGUST BIRD-LIFE OF THE HACKENSACK MEADOWS  
Background by Bruce Horsfall. Birds by E. W. Smith.

## AUGUST BIRD-LIFE OF THE HACKENSACK MEADOWS

THE thousands of acres of marshland bordering the Hackensack River and Newark Bay, so familiar to travelers over the railways which pass through them, are commonly esteemed worthless ground, but to the naturalist they abound in interest.

In their lower portion, colonies of Florida Gallinules and Pied-billed Grebes have been found nesting; but it is in August that birds are most abundant in the marshes, and they then possess the strongest attraction for the ornithologist. At this season the wild rice begins to ripen, bringing to the marsh a large, though ever decreasing, number of Bobolinks and Sora Rails, that delights to feed upon it.

The Bobolink is now in its streaked, sparrow-like plumage, and under the name "Reedbird" is ranked in New Jersey as a game bird (!) and is killed in thousands by men who would not raise a finger against the black-and-buff songster of our June meadows.

The Sora, in spite of its small size and sluggish flight may, with greater reason, be ranked as a game bird, but at the present rate of decrease it will pay the penalty of this distinction by practical extermination in this region. Red-winged Blackbirds also come to feed on the rice.

During the latter half of July, August and September, Swallows (by far the most abundant birds of the meadows) use the marshes as dormitories, coming to them in incalculable numbers in the evening to sleep, and leaving them early the following morning to radiate to every point of the compass. During the day, and as the birds gather for their evening flight, they may be seen perching in long lines on roadside telegraph lines.

In August the marshes are as remarkable for their flowers as for their birds. The great rose mallow is doubtless the most beautiful, as it is also one of the most abundant species, acres sometimes being pink with the bell-shaped flowers. There are also brilliant cardinal flowers, *sagittaria*, pickerel weed, jewel flowers, all of which are shown in the group, and many other species.

The studies for this group were made about one mile south of Little Ferry, N. J. The view shown is toward the west.

With the so-called "march of civilization," all this wealth of bird and plant life is bound to disappear, to be replaced by railways, factories and docks.





## THE WILD TURKEY IN THE MOUNTAINS OF WEST VIRGINIA

**T**HE Wild Turkey, in spite of its name, is distinctly an American bird, which formerly ranged throughout the wooded portion of the eastern United States, from southern Maine and southwestern Ontario, south to Florida and southwest to New Mexico and Arizona, whence it extends southward onto the Mexican tableland.

It has now become rare or extirpated in the more settled portions of its range and is rarely found as far north as Pennsylvania and Ohio.

Throughout its wide range, the Wild Turkey presents some variations in color, the extremes of which are shown by the Eastern Wild Turkey and the Mexican Wild Turkey. These birds differ chiefly in the color of the tips of the tail-feathers and upper tail-coverts, which in the eastern bird are chestnut, and in the Mexican bird, whitish.

Singularly enough, our barnyard Turkey is descended from the Mexican bird, which the Spaniards found among the Aztecs in a state of domestication. It was introduced from Mexico into Europe, where it had become well established in 1530, and from Europe was brought by the Colonists to eastern North America.

Although the domesticated bird will readily cross with the wild one, no extensive effort has been made to domesticate the latter, and the inhabitants of our barnyard still show the whitish-tipped tail and tail-coverts of their Mexican ancestors.



FLORIDA GREAT BLUE HERON

Background by Bruce Horsfall.      Birds by H. C. Denslow.

## FLORIDA GREAT BLUE HERON

**T**HE Great Blue Heron, often miscalled "Crane," is distributed throughout North America. On the humid northwest coast it is darker than in eastern North America; in the arid Great Basin region it is paler; and the Florida form shown here, known as Ward's Heron, is somewhat larger than the others.

Hérons are more aquatic than Cranes and feed largely on fish. In the Eastern States they invariably nest in trees, but in the West they often nest among the reeds like Coots. Young Herons are born in a more or less naked condition and are reared in the nest; Cranes are hatched with a downy covering and can run about shortly after hatching. Herons fly with a fold in the neck, but Cranes keep the neck outstretched.

On the ground the Heron is a rather homely object, with his lanky form and long legs and neck, but in flight, his neck folded, the great wings, slowly flapping, bear him on in no little stateliness. Rarely he sets his wings and soars grandly in lofty circles.

In hunting, he either stalks patiently, lifting his feet and setting them down with the greatest deliberation and care, or stands even more patiently waiting. In either case he ends with a lightning-like thrust with his beak. Frogs, fish, reptiles, and even mice are thus accounted for.

The Great Blue Heron's eggs are pale blue, unmarked, two and a half inches long. Three or four form a set.

The only notes are loud squawks.



THE SANDHILL CRANE IN FLORIDA  
Background by Bruce Horsfall. Birds by Herbert Lang.

## THE SANDHILL CRANE ON THE KISSIMMEE PRAIRIES

**I**N 1632, when Morton wrote of New England birds, "of Cranes there are a great store—they sometimes eate our corne and doe pay for their presumption well enough—a goodly bird in a dishe and no discommodity," he referred to the species in this group. At that time it was doubtless common throughout North America; now it nests in Florida only of the Atlantic Coast States, and, in the interior, only in the upper Mississippi Valley and in the Canadian border states westward to Oregon and northward into Canada.

In Florida, the Sandhill Crane is still to be found on the great Kissimmee Prairies and their adjoining low, pine-grown lands, where the studies for the present group were made. Here, in March, it commonly builds its little island nest in the water-filled depressions thickly grown with a species of pickerel weed locally known as "bull-tongue."

Nest-building is preceded by the singular antics of courtship, when both males and females hop, skip and jump about one another, bowing low and leaping high, all the time croaking and calling. Their matrimonial affairs settled, one hears only the loud but sonorous trumpeting of the male which, when heard near by, is harsh and rasping, but, when softened by distance, becomes one of the most attractive sounds of a Florida dawn.

Although superficially resembling Herons, Cranes are more nearly related to the Rails. Young Cranes, like young Rails, are born thickly covered with down, and they run shortly after leaving the egg. The young Heron, on the contrary, is hatched scantily covered with hair-like feathers and spends over a month in the nest. Cranes further differ from Herons by flying with the neck fully extended (see the birds in the painting), while Herons fly with a fold in the neck which brings the head nearly back to the shoulders.

Cranes are less aquatic than Herons. One may see them walking about the pine woods or over the prairies, dignified, stately figures, hunting for seeds, roots, grasshoppers, snails or lizards, while near the water, frogs are captured.



THE SNAKE-BIRD OR WATER-TURKEY  
Background by Bruce Horsfall.

## THE ANHINGA, OR WATER-TURKEY, IN FLORIDA

**T**HE fact that the Anhinga resembles both a turkey and a snake sufficiently to have received the names "Water-Turkey" and "Snake-bird" is an excellent comment on the peculiarity of the bird's appearance and habits.

The first-mentioned name finds its origin in the highly developed, broadly tipped, turkey-like tail. The second relates to the long, slender, snake-like neck, and when the bird swims with its body submerged and only the long, shining neck, head and sharply pointed bill above the water, the resemblance to a serpent is greatly increased. (See bird in group.) It may be added that the bird's book name of "Anhinga" is of Portuguese origin and means snaky.

The Anhinga is equally at home in the water and high in the air, combining in an unusual manner the habits of an aquatic and an aerial bird. Its form, close plumage and broadly webbed feet—all four toes being united by membranes as in the Cormorants—admirably fit it for life in the water, and it not only dives with great ease, but pursues and captures its prey under water, the tip of the bill being provided with fine, tooth-like serrations to enable it to grasp its slippery victims.

After prolonged submersion the Anhinga's plumage, in spite of its texture, becomes more or less saturated with water, hence the bird, while drying its feathers, stands with wide-open wings. (See bird at right.)

The Anhinga's webbed feet make it at home in the water, but it is the bird's tail which renders it, for a diving bird, equally at ease in the air. With spread wings and tail it soars in circles, hawk-like, for long periods, evidently for the pleasure it finds in this exhilarating form of exercise.

Anhingas are born naked and are reared in the nest, which is a remarkably well made structure. When a few days old, a buff down begins to appear, which soon covers them. Like the young of Pelicans and Cormorants, they secure their food from the parent's throat.

The background represents a "bonnet," or yellow pond lily lake with its surrounding cypresses and palmettoes, 17 miles west of St. Lucie, Florida.



A GLIMPSE OF PELICAN ISLAND, FLORIDA  
Background by Bruce Horsfall. Birds by Ernest W. Smith.



## THE BROWN PELICAN ON PELICAN ISLAND, FLORIDA

**B**ROWN Pelicans normally nest in bushes, and when the birds first came to Pelican Island, Florida, the island was covered with mangroves, in which the birds placed their nests. Severe frosts and over-use by the Pelicans have killed all but a few trees. When these are occupied by from two to five nests each, the remaining birds build their nests on the ground, most of them resorting to a sand-bar at the east end of the island, where they are as thickly grouped as the painting indicates.

The young Pelican (ground nest, front, left, in the group) is born naked. When about ten days old a downy plumage begins to appear, which soon changes the bird from black to snowy white (ground nest, front, rear, and center, front). The brown flight-plumage now begins to grow, showing first in the shoulders and humeri (ground nests, front, center and right), and at the age of about two months this plumage is fully developed.

The young are fed on predigested fish regurgitated by the old bird into the tip of the pouch (ground nest, left, rear). Later the young birds (sometimes all three at once) eagerly thrust their heads into the parent's mouth and get their first fish from the base of its pouch. Possibly in this habit may be found the origin of the myth in which the parent Pelican opens her breast to supply nourishment for her offspring. When the young Pelican secures fish longer than it can swallow, it sits with the tail projecting from its mouth, patiently waiting for the head to digest (ground nest, center, front).

The inhabitants of Pelican Island have often been wantonly molested by man, and at times the vandalism of tourists, who killed the birds and robbed them of their eggs, has threatened the existence of this remarkable colony. To prevent so unfortunate a catastrophe, President Roosevelt set aside Pelican Island as a government reservation, and a warden is employed to guard it during the nesting season. Only visitors who have secured a permit from this warden are allowed to land on this island.



THE AMERICAN EGRET IN A SOUTH CAROLINA CYPRESS FOREST

Background by Bruce Horsfall.

Birds by Herbert Lang.

## THE AMERICAN EGRET IN A SOUTH CAROLINA CYPRESS FOREST

**A**NYONE who knows how abundant the Snowy "Hérons" or Egrets once were in our Southern States may be surprised to learn that no little difficulty was experienced in finding a locality where the necessary studies could be made for an Egret group. So effectively, indeed, have the plume-hunters done their work, that it was feared that this beautiful and fast-vanishing species could not be included among the Habitat Groups, when, quite by chance, a colony of Egrets was heard of on a shooting preserve in South Carolina. It appears that when the land was acquired it contained a few Egrets, survivors of a once flourishing colony. The new owners rigidly protected them, and they soon began to increase, forming at the end of seven years a rookery which would have done credit to the days of Audubon.

The nests were in cypresses at an average height of forty feet, and the birds were studied and photographed from a moss-draped blind attached to the limb of a tree forty-five feet above the water.

Sketches for the background were also made from the trees in order to secure the desired effect of height.

The plumes or "aigrettes," for which this Heron and its near relatives inhabiting the warmer portions of the world have been slaughtered, are worn by both sexes. They are acquired prior to the nesting season and constitute the birds' wedding costume, to be displayed, as the pose of the bird in the group indicates. As the season advances and they become frayed and dirty, they are shed.

All statements that such plumes are obtained from birds kept on "Egret Farms" are absolutely false.

Aigrettes are to be secured, therefore, only during the period of reproduction, and this fact, added to the Heron's communal habits, accounts for the surprising rapidity with which the birds have been brought to the verge of extinction. Concealed in the rookery, it is a simple thing to shoot the parents as they return with food for their young; and in the early days of "pluming" it was not unusual for a man to kill several hundred birds at a sitting.



THE TURKEY BUZZARD

Background by Hobart Nichols.      Birds by Herbert Lang

## TURKEY BUZZARD

**W**IDELY distributed over temperate and tropical America, the turkey vulture—or, as it is more commonly called, turkey buzzard—is a familiar bird in many parts of the South, where it may be seen gravely stalking about in search of food or gracefully soaring in wide circles overhead.

As Bendire has written: “They look their best aloft as their flight is exceedingly easy and graceful, while the apparent absence of all effort as they sail in stately manner overhead, in ever changing circles, and without any apparent movement of their well shaped wings, makes them really attractive objects to watch; but let them once descend to the ground or alight in a tree, and attractiveness ceases; now they are anything but prepossessing, and it requires no effort to place them where they properly belong—among the scavengers of the soil.

Once looked upon as a useful scavenger, and protected by law and custom, it is now regarded with suspicion, or even looked upon as an undesirable citizen, on account of its spreading hog cholera as a result of feeding on carrion.

The locality shown is Plummer’s Island, in the Potomac, just above Washington, looking up the river toward a stretch of rapids known as Stubblefield Falls. This island is the headquarters of the Washington Field Naturalists’ Club, a small and select organization that includes many of our best known naturalists, and is their favorite week-end resort.



A CACTUS DESERT AND ITS BIRD-LIFE  
Background by Bruce Horsfall. Birds by H. C. Denslow.

## A CACTUS DESERT AND ITS BIRD-LIFE

THE great cactus-covered deserts, so characteristic of the more arid portions of Mexico, push a well developed arm northward into Arizona, forming too marked a feature of North American scenery to be omitted from any series of representations designed to include at least the more pronounced types of our landscape.

Since this region has no colonies of birds, and no one bird of sufficient size to be treated alone, it was decided to prepare a group which should show its common birds as well as its commoner forms of vegetation.

Tucson, in southern Arizona, was selected as a suitable locality for our studies, throughout which we had the invaluable advice of Dr. D. T. MacDougal, Director of the Desert Botanical Laboratory of the Carnegie Institution, which is situated at this point.

At the time (May 9-20, 1906) of our visit the desert vegetation was at its best, and looking out over the variously colored blossoms it was difficult to believe that we were not in a land of great fertility.

The birds of this region, like its plants, are of Mexican origin. Along the "washes," which after rains in the mountains are streams for a brief period, mesquites and acacias grow abundantly, and here such brightly colored birds as Cardinals and Vermilion Flycatchers are found. Where this irregular but natural type of irrigation is lacking, the vegetation is chiefly of cactus which, affording but little shelter for birds of bright colors, is inhabited chiefly by species of neutral-tinted plumage.

Here Mockingbirds and Thrashers (chiefly *Toxostoma curvirostre palmeri*), Cactus Wrens, Roadrunners, Gambel's and Scaled Quail, Texas Nighthawks, Inca, White-winged and Mourning Doves, Black-throated Sparrows, Gilded Flickers and Crested Flycatchers (*Myiarchus*) nested in the giant cacti.

The making of the vegetation for this group called for unlimited skill and patience on the part of the preparator. Every joint of cactus shown is a facsimile reproduction of the original. Before making the plaster molds, every one of the hundreds of spines was carefully removed. After the casts had been taken from the mold (the *Opuntia* in wax, the others in plaster) they were colored from field studies of growing plants, and the original spines were then set in their proper positions.



CALIFORNIA CONDOR IN PIRU CAÑON  
Background by Charles J. Hittell.



## THE CALIFORNIA CONDOR

**L**EWIS and Clarke found the California Condor as far north as the Columbia River in Oregon, and, at this time, it was distributed southward through California to northern Lower California. This was assuredly a surprisingly restricted range for a bird possessing such unusual powers of flight; but it now occupies an even smaller area, being found only in the Coast Ranges of southern California, from Monterey County southward.

The Condor's rapid decrease is believed to have been occasioned by its feeding on the poisoned carcasses of cattle exposed by ranchmen as bait for bears, panthers and wolves. Since these predaceous animals have now become exterminated or greatly decreased, this unfortunate habit has been abandoned and the Condor is now holding its own.

The California Condor weighs from 20 to 25 pounds, and while not as heavy a bird as the Condor of the Andes, slightly exceeds it in stretch of wing, the average California Condor measuring about nine feet from tip to tip. When flying, the Condor bears a strong resemblance to the Turkey Buzzard, but when the two are seen together the Condor's much greater size is pronounced, while its white under wing-coverts are conspicuous as the bird soars overhead.

The Condor lays its single egg in crevices in the rocks or in caves without pretense of nest, in February and March, and the researches of Finley and Bohlman show that the young bird is between four and five months old before it makes its initial flight.

Studies for the present group were made in Piru Cañon, some twenty miles north of the village of Piru, and fifty miles southeast of Santa Barbara, where for many years a pair of birds had nested in a cave which pierced the vertical cañon wall 150 feet above the water. From this cave were taken when young the Condors now (1915) living in the National Zoölogical Park in Washington, D. C.

The visitor is supposed to be in the Condor's cave, from which he looks up the cañon. The cave was not occupied at the time the studies were made, a passing hunter having wantonly shot one of the birds.

Condors were also found by the Museum expedition up the Agua Blanca, a tributary of the Piru, on one occasion seven of the magnificent birds being in sight at once.



BRANDT'S CORMORANT AT MONTEREY, CALIFORNIA  
Background by Charles J. Hittell. Birds by Herbert Lang.

## BRANDT'S CORMORANT AT MONTEREY, CALIFORNIA

**V**ISITORS to Monterey, California, on the Southern Pacific R. R., who have taken what is known as the "Seventeen-Mile Drive," may recall the rocky islet standing in the Pacific about a quarter of a mile off the coast near Cypress Point. This islet and the Cormorants which each year nest upon it are shown in this group.

Brandt's Cormorant also nests on other islets off our Pacific Coast, and it is a regular visitor to the rocks off the Cliff House at San Francisco, where, however, it does not nest.

Both when flying and when resting upon the water the Cormorant suggests a large duck. The resemblance, however, is superficial, the Cormorant being related to the Pelicans, Gannets, Anhinga and all other birds which have the hind toe connected with the front toes by a web.

The Cormorant is an expert diver and catches its food of fish by pursuing it under water, the hooked bill of the bird doing good service, while the broadly webbed feet propel it at great speed. It is the skill of the Cormorants in fishing that has led both the Chinese and Japanese fishermen to train the birds to act as assistants to them in pursuit of their calling.

The young Cormorant, in common with other members of its order, and unlike the downy young of ducks and geese, is hatched naked and passes more than a month in the nest. The young secure their food by thrusting their heads down the parent's throat. At first sight one might easily imagine that the old bird was trying to swallow its offspring.

When the young bird is a few days old, a thick black down begins to appear on it. Shortly after this coat becomes complete, it is succeeded by the flight plumage. This is dull brownish black, the glossy plumage of maturity being acquired later. As special adornments of the breeding season both the male and female Cormorant don certain spiny, white nuptial feathers on the back or about the head and neck, while the bare skin of the cheeks and pouch becomes brightly colored. In Brandt's Cormorant, as will be observed, the pouch is rich blue and the birds appear to distend it for the purpose of display.

Cormorants, like their near relatives, are virtually voiceless, a harsh, rasping call being their only note.



SUMMER BIRD-LIFE OF AN IRRIGATED PORTION OF THE SAN JOAQUIN VALLEY, CALIFORNIA  
Background by Charles J. Hittell. Birds by H. C. Denslow.

## SUMMER BIRD-LIFE OF AN IRRIGATED PORTION OF THE SAN JOAQUIN VALLEY

**A**T Los Baños, in the San Joaquin Valley of California, the waters of the San Joaquin River are used to flood vast areas to create grazing land for cattle. The region is naturally dry and arid, but irrigation soon transforms the desert into a series of creeks, ponds and marshes. The desert plants are replaced by *Sagittaria*, *Ranunculus* tulés and cat-tails and the desert birds give way to a remarkable assemblage of water birds, whose local distribution is governed by the presence or absence of water.

Driving along a levee, which extends as far as the eye can reach, the old and the new life is found to be separated only by the width of the dike. On the left is a parched and sterile plain with Horned Larks, Burrowing Owls, Jack-rabbits, Coyotes, Rattlesnakes and other characteristic desert forms; while on the right is water and fertility, with Ducks, Herons, Ibises, Coots, Stilts, Avocets and other aquatic species in countless numbers.

To the east the view stretches across the desert toward the distant Sierras, where on clear days may be seen the snow fields which, eighty miles away, supply the water at one's feet. To the west (the view represented in the group), one looks over green marshes and shining ponds fairly twinkling with fitting wings, to yellow fields leading up through molded brown foothills to the crests of the Coast Range.

The group contains only the commoner birds of the region—Black-necked Stilts, Avocets, Killdeer, Black and Forster's Terns, Black-crowned Night Herons, White-faced Glossy Ibises, Coots, Mallards, Pintails, Cinnamon Teal, Ruddy and Fulvous Tree Ducks.

While it is true one would not find all these species in a space eight by twenty feet, one could frequently see all or most of them in a single glance, and the impression the group seeks to convey is therefore within the truth.

The sudden changes occasioned by the irregularity of the water supply are often disastrous to the birds nesting here. The homes of birds which begin to nest before the water has reached its height are sometimes flooded, while the withdrawal of the water deprives the birds of its protection and makes their nests and eggs accessible to marauding animals



A FLAMINGO COLONY IN THE BAHAMAS

Background by L. A. Fuertes (birds) and Charles J. Hittell (landscape). Birds by Herbert Lang.

## A FLAMINGO COLONY IN THE BAHAMAS

**B**EFORE the studies for this group were made, very little was known about the nesting-habits of Flamingoes. For this reason, and because of the belief that a reproduction of a Flamingo city (beyond question the most remarkable sight in the world of birds) would possess exceptional interest, an expedition was dispatched to the Bahamas in 1902, to find Flamingoes on their nesting grounds. It was unsuccessful; but in 1904 the search was resumed, and on this occasion the birds were discovered, and from an artificial blind, concealed in the very heart of their rookery, containing 2,000 birds, a series of unique photographs and observations was made.

The birds begin to lay their eggs early in May. Their nests are constructed by scooping up mud with the bill and patting it down with bill and feet. The nests are raised to a height of from eight to fourteen inches to protect their contents from a subsequent rise in the water.

Both sexes incubate; one by day the other by night. The young are hatched covered with down, like young ducks. They remain in the nest three or four days and during this period are fed by the parents on predigested juices of a mollusk of the genus *Cerithium*. (See standing bird at the left and also the sitting bird at the right, which is brooding and is about to feed.) They also eat the shell of the egg from which they have so recently emerged.

The singular shape of the bill of the adult Flamingo is related to the manner in which it secures the small spiral *Cerithium* shells which, in the Bahamas, appear to constitute its only food. To obtain them, the bill is pressed into the soft mud until its point turns upward. The lower mandible moves rapidly, forcing out the mud and water through the channels along the sides of the bill and leaving the shells.

It will be noted that the bill of the young Flamingo is essentially straight, but when about two weeks old the curve becomes evident and the young bird begins to feed as does its parent.

When a month old, a second downy plumage is acquired (see bird at right), and at the age of two months, this is replaced by a dress of brownish feathers (see bird at the left). In October or November this is probably followed by the pink plumage of maturity, since no brown birds are seen in the spring.



BOOBIES AND MAN-O-WAR BIRDS ON CAY VERDE

Background by Bruce Horsfall. Birds by Herbert Lang.



## THE BOOBY AND THE MAN-O'-WAR BIRD IN THE BAHAMAS

CAY VERDE is a coral islet, some forty acres in area, situated about two hundred and thirty miles southeast of Nassau in the Bahamas. Like all reef keys, it is at the junction of a bank with the ocean, and the background clearly shows how sharply the dark blue water, indicating the great depths of the sea, is separated from the lighter water over the shallow banks.

Cay Verde was reached on the "Physalia," a small yacht which the Marine Biological Laboratory of the Carnegie Institution placed at the disposal of the Museum for this occasion. The voyage was begun at Miami, Florida, on March 28, 1907, but unfavorable weather, including a severe storm, in which the "Physalia" narrowly escaped being wrecked, delayed the arrival at Cay Verde until April 8. The Cay has no fresh water and its only vertebrates are birds, one species of snake and two of lizards.

The Boobies, of which there were about 1500 pairs, nested only on the ground, making little or no nest. They were so tame that one could walk about among the sitting or brooding birds without causing them to leave their eggs or young. As a rule Boobies lay two eggs; but the second is apparently not laid for about a week after the first, and as a rule only one hatches.

The two or three hundred Man-o'-War Birds which lived on Cay Verde placed their nests in the dense growth of "sea-grape" and cactus which covered a portion of the Cay. They lay but one egg. The young acquire a covering of whitish down when a few days old, and this is quickly followed by a surprising development of the feathers of the back, which it will be observed more than cover the back before the corresponding feathers appear in the young Booby.

The male Man-o'-War Bird has the remarkable habit of inflating its red gular or throat-pouch until it resembles a toy balloon. The birds sit on their nests or even fly about displaying this surprising appendage.

With a wing expanse of between seven and eight feet and a body no larger than that of a hen, the Man-o'-War Bird is one of the most powerful and graceful of flyers. It feeds largely on flying-fish, which it catches in the air.



AMERICAN EGRETS IN CUTHBERT ROOKERY

Study for the group from Nature.



CUTHBERT ROOKERY GROUP

L. A. Fuertes making sketches for the background.

## A FLORIDA ROOKERY

“**R**OOKERIES” are, or rather were, one of the characteristic features of the bird-life of Florida. The term is generally applied there to all gatherings of roosting or nesting birds, whether Pelicans, Cormorants or Ibises, but, because of their commercial importance, one more frequently hears of Heron rookeries. Before the demand for their plumage had brought the aigrette-bearing Herons and Roseate Spoonbill to the verge of extermination, a Florida rookery was one of the most remarkable sights in the bird-life of our country.

One may still find colonies of Ibises, Cormorants, Pelicans and plumeless Herons, but of those great gatherings of birds which were once so abundant, Cuthbert Rookery appears to be the only one remaining. Here only will one find the birds just named and with them American and Snowy Egrets and Roseate Spoonbills. It seemed therefore especially desirable to make studies there on which to base a representation of this almost vanished phase of our bird-life.

As may be imagined, Cuthbert Rookery has continued to exist only because of its remoteness. It is situated in the heart of the great mangrove swamp which borders the Everglades at the extreme southern part of the state. So shallow is the water off this part of the Florida coast that the sharpie bearing the Museum expedition, although it drew only two and a half feet, could not approach nearer the shore than seven miles, and five hours were required to reach land by pushing and poling in small boats. In four hours more, following narrow passages through the dense mangroves, Cuthbert Lake was reached. The Rookery is on a small islet, about a mile from the entrance to the lake. At this time (March 29, 1908) it was estimated to contain about 35 Roseate Spoonbills, 15 Snowy Egrets, 350 American Egrets, 50 Little Blue Herons, 2000 Louisiana Herons, several hundred Ibises and a few Cormorants and Water-Turkeys. Only the Spoonbills, Herons and Egrets were nesting.

The group is designed to show a portion of the rookery with the birds nesting and roosting in the mangroves, while the background portrays the whole islet at evening when the birds are returning.



A GOLDEN EAGLE'S NEST IN BATES'S HOLE, WYOMING

Photograph from Nature of the scene reproduced in the group.

## THE GOLDEN EAGLE IN WYOMING

**T**HE Golden Eagle ranges throughout the mountainous parts of the Northern Hemisphere. In North America it is now very rare east of the Rocky Mountains, but from the Rockies west to the Pacific, and north to Alaska, it is not uncommon. In the mountains, the bird nests on cliffs, but on California it often builds in trees, white oaks being frequently chosen.

Although the Golden Eagle is powerful enough to prove a dangerous antagonist, it never attacks man, in spite of sensational stories to the contrary. Even when its nest is approached, the bird makes no attempt to protect its young, but either disappears entirely, or, calling, circles high in the air.

Eagles, like most raptorial birds, nest early in the year. They usually lay but two eggs, which hatch after thirty-five days' incubation. The young remain in the nest about two months. The natural food of the Golden Eagle in the west consists chiefly of small mammals of various kinds, such as prairie dogs, rabbits, squirrels, spermophiles and rats, together with ducks, geese and grouse. Occasionally it takes a young deer or antelope. On the whole, however, under natural conditions, the Golden Eagle is a beneficial bird because of the large number of rodents it destroys. But where sheep have been introduced, the Golden Eagle may become more or less injurious through its acquired habit of preying on lambs.

Four species of Eagles have been recorded from America north of Mexico. Of these the Gray Sea Eagle, an Old World species, is found in this hemisphere only in Alaska; and the Harpy Eagle, a tropical species, has been recorded but once, from Texas. This leaves virtually only two North American species, the Golden and the Bald Eagle. When the Bald Eagle is mature, with a white head and tail, the two species are very unlike in color, but before the Bald Eagle acquires its distinctive marks, it bears a general resemblance to the Golden Eagle. The latter, however, has the legs feathered to the toes, while in the former the lower part of the "legs" (tarsi) is bare.



WHISTLING SWAN

Background by Hobart Nichols. Birds by Walter Escherich.

WHISTLING SWAN ON SOUTHAMPTON ISLAND,  
HUDSON BAY

**A** SWAN on the nest, as shown here, is a conspicuous object, visible far across the arctic prairies, which are the home of this species. The human population is scant, however, and the powerful birds have been known to kill a marauding fox. The nest is built of moss, etc., raked up in the immediate vicinity, and in it are laid two to five white eggs, four and a quarter inches long. The pair of Swans share the labor of nest-building, of the thirty-five days of incubation, and of caring for the young. The babies are clothed in white down, but this is soon displaced by a grayish plumage, in which the young swans, called cygnets, travel south with their parents in the autumn.

Swans feed chiefly on the grasses and tender water-plants they pull from the bottom, reaching downward with the long neck or, if necessary, tilting the body forward till the tail points toward the sky, after the fashion of the common domestic duck and related species. They cannot dive for food as do so many ducks. Small mollusks are also eaten.

Swans are famous for their loud, clear voices, resembling trumpets, horns or other wind instruments.

The Whistling Swan breeds in arctic Alaska and Canada east to Hudson Bay. In winter it is not uncommon locally on the Atlantic Coast south from Maryland and along the Mississippi Valley, Gulf Coast and Pacific Coast. Here in the Northeast it is only a rare migrant, and anyone is very fortunate who ever sees a high-flying flock and hears their far-reaching, clarion calls.

The only other swan in North America is the Trumpeter, now very rare, possibly extinct. It is an even larger bird and lacks the yellow spot in front of the eye.



WHOOPING CRANE

Background by Hobart Nichols. Birds by Walter Escherich.



## WHOOPING CRANE

**T**HE Whooping Crane is one of the largest of North American bird and the stateliest. It has been sent down the same road as have so many conspicuously fine species, and now seems on the verge of extinction, for it is rare even in its restricted breeding range and unknown on the Atlantic Coast, where it formerly occurred as a transient. It winters from the Gulf States to central Mexico.

In December, 1811, on the Mississippi, Nuttall witnessed a migration of this species, assembled in a "mighty host. Their flight took place in the night, down the great aerial valley of the river. \* \* \* The clangor of these numerous legions passing along high in the air seemed almost deafening \* \* \* and as the vocal call continued nearly throughout the whole night without intermission, some idea may be formed of the immensity of the numbers now assembled on their annual journey to the regions of the South."

The important differences between cranes and herons are noted in the description of the Sandhill Crane group on the opposite side of this gallery. Like other cranes, the Whooping has an elaborate courtship dance, nests on the ground in open country, is nearly omnivorous, and possesses a far-reaching, clarion voice.

The scene here shown is an autumn one on Heron Lake, Minnesota, where thousands of Canvasbacks, gulls and other waterfowl still congregate, and a very few Whooping Cranes may perhaps yet be seen on migration. The brown and white bird is a young one. One of the adults is trumpeting to the flock passing overhead.



A KLAMATH LAKE BIRD COLONY

Background by Charles J. Hittell. Birds by Herbert Lang.

## KLAMATH LAKE BIRD-LIFE

**K**LAMATH LAKE is situated in northeastern California on the Oregon boundary-line. Its shallow water permits a great growth of tulés, or rushes, which almost completely fringe the shore, in places expanding to a width of several miles. They also form islands varying in size from a few square yards to many acres in extent. It is on these islands that the bird colonies are established. There is no soil or beach, and all the birds nest on the beds of matted tulés, usually at the border of the island. The White Pelicans, therefore, find here no pebbles with which to construct their usual mound-like nests; the Caspian Terns do without sand, and the Cormorants without rocks. Far more important than these is the protection which ground-nesting communal birds require, and this the islands supply.

Fifteen colonies of White Pelicans were counted in this locality between June 30 and July 7, 1906, and doubtless there were others, since only a part of the bird-inhabited region was examined. There were also great numbers of California and Ring-billed Gulls, Caspian Terns and Farallon Cormorants, while Great Blue Herons, in default of trees, built platform nests of tulés among the growing tulés. White Pelicans feed while swimming, and were here devouring diseased fish which were floating in the water in large numbers, while Brown Pelicans capture their prey by diving; but the young of both species make their first attempts at fishing down the parental pouch, as a comparison of this group with the one of the Brown Pelican on the opposite side of the lake will show. The White Pelican weighs sixteen pounds, twice as much as the Brown Pelican. Its wing expanse is between eight and nine feet and, when in the air, it is one of the most impressive of birds.

Only one colony of the Caspian Tern—the largest, as it is one of the rarest members of its family—was observed, and this has since been extirpated, for none was seen in 1915. The same fate also seems to have overtaken the Ring-billed Gulls in spite of the fact that this lake is now a Government reservation.

The group represents the border of a tulé island, while the background shows other bird-inhabited islets, the surrounding treeless hills, and Mount Shasta in the distance.



ARCTIC-ALPINE BIRD-LIFE IN THE CANADIAN ROCKIES

Background by Carl Rungius from a sketch by I. A. Fuertes.

## ARCTIC-ALPINE BIRD-LIFE OF THE ROCKY MOUNTAINS

WHERE the summits of the Rocky Mountains, Sierras and Cascade Range reach above timber-line to the limits of perpetual snow, the boreal nature of the climate produces conditions favorable for the existence of many plants and animals which, in the Arctic Regions, are found at sea-level. The altitude at which these conditions appear increases as the latitude decreases. For example, in Colorado, at latitude 40°, timber-line is at 11,000 feet altitude, while in Alberta, Canada, at latitude 50°, timber-line is at about 7,500 feet.

Where the area of sufficient altitude is practically continuous the presence of arctic forms of life may be due to extension of range southward; but where it is discontinuous, a boreal area may be separated from a similar region to the north by intervening lower ground, when the occurrence of boreal forms may be attributed to the influence of the Glacial Period. Forced southward during the Ice Age, they were left stranded on these high Arctic-Alpine islands as the ice receded.

The characteristic Arctic-Alpine birds of our western mountains are the White-tailed Ptarmigan, the Rosy Snow Finch (*Leucosticte*) and the Pipit. In the Rockies they are found as far south as Colorado or New Mexico. The Pipit migrates southward in winter, but the Ptarmigan and Snow Finch are practically permanent residents, in winter descending only slightly below timber-line. At this season, as is well known, the Ptarmigan acquires a pure white plumage. (For a seasonal group of Ptarmigan and an explanation of their plumage changes, see the Main Bird Hall.)

The studies for this group were made in the Canadian Rockies about fifteen miles north of Laggan at the Ptarmigan Lakes. The party outfitted at Lake Louise, and ascended the mountains to the northward, from which one obtains a beautiful and impressive group of mountains in the Canadian Rockies. At the left, beyond Mount Redoubt, in the foreground, lie the peaks of Moraine Lake; in the center is Mount Temple; and to the right, Hungabee, Lefroy and Victoria.

At this season (July 15, 1907) the alpine spring was at its height. The lakes were opening; great white anemones were blooming at the border of the snowfields; the heather was white with little bell-like flowers, and the beds of fluted *Dryas* leaves were starred with blossoms.



SAGE GROUSE IN WYOMING

Background by Carlos Hittell. Birds by Herbert Lang.

## THE SAGE GROUSE IN WYOMING

**N**EXT to the Wild Turkey, the Sage Grouse is the largest of North American game birds. Its range is restricted to the high, sagebrush (*Artemisia tridentata*) plains of the West, from western Nebraska and western Dakota north to, and in places slightly beyond, the Canadian boundary, west to eastern Oregon and north-eastern California, east of the Sierras, and south through Utah and Nevada.

Within these limits the Sage Grouse is resident, but it migrates locally at the approach of winter from higher to lower altitudes, as the snows deprive it of its food. This consists largely of the leaves of the sagebrush, but in summer the leaves and seeds of other plants are eaten. When feeding on sagebrush leaves, the flesh of the old birds is flavored by the nature of their food, but the birds of the year are very palatable.

The Sage Grouse begins to mate very early in the spring, or, in some localities, as soon as late February, and at this season the males indulge in the most remarkable performances, inflating the yellow sacs at either side of the neck, spreading the tail, dropping the wings and strutting like a turkey cock.

At times the bird varies this performance by plowing its breast along the ground as it utters a "variety of chuckling, cackling or rumbly sounds." This habit is represented by one of the birds in the group, and is the cause of the abraded condition of the breast feathers of the cock Grouse.

The nest is a slight affair, usually placed beneath a sagebrush where it is often found by a marauding coyote. The hens hatch the eggs and raise the young unaided by the male, which, when its mate begins to sit, joins with others of its sex to form flocks composed only of males.

When the young are grown the sexes mingle in great bands, which formerly contained thousands of birds. The birds drink night and morning at some regularly frequented spring, about which they sometimes gather so thickly that they must await their turn to reach the water.

The studies for this group were made at Medicine Bow, Wyoming, on the line of the Union Pacific Railway. The mountain to the right is Elk Mountain; those in the distance belong to the Snowy Range of Colorado.



THE LOVE-MAKING OF THE PRAIRIE HEN

Background by Bruce Horsfall. Birds by H. C. Denslow.



## THE PRAIRIE HEN IN NEBRASKA

ON frosty spring mornings, as the sun rises over the prairies, one may at times hear a singular, resonant, booming note, *boom-ah-b-o-o-m, boom-ah-b-o-o-m*. It is the love-song of the Prairie Hen. He may be near at hand or possibly two miles away, so far does this sound, unobstructed by tree or hill, carry in the clear air. It is well worth following, however, for we may find the maker of it, with perhaps ten to fifty of his kind, engaged in a most remarkable performance.

During the mating season, from March until early in May, the Prairie Hens of a certain district or area gather before daybreak to take part in these courtship demonstrations. The feather-tufts on either side of the neck are erected like horns, the tail raised and spread, the wings drooped, when the bird first rushes forward a few steps, pauses, inflates its orange-like air-sacks, and, with a violent, jerking, muscular effort, produces the startling boom, which we may have heard when two miles distant.

At other times, with a low cackle, he springs suddenly into the air, as though quite unable to control himself, and finally he comes within striking distance of a rival who has been giving a similar exhibition. Then, with much clashing of wings, a fight ensues which often strews the nearby grass with feathers.

These tournaments of display and combat are doubtless designed to arouse the attention of the females, but they also occur when only males are present. Within an hour or two after sunrise, the time varying with the ardor of the birds, the competition is over for the day and the rivals feed peacefully together, until they enter the lists the following morning.

Market hunting has greatly decreased the numbers of Prairie Hens, but on the United States Government Forest Reservation, in the sparsely inhabited sandhills of western Nebraska, on the line of the Chicago, Burlington and Quincy R. R., where the studies for this group were made, they still exist.

The eastern Prairie Chicken, or Heath Hen, was once locally common from New Jersey to Massachusetts, but it is now found only on Martha's Vineyard.



GREBES (UPPER FIGURE) AND WILD GOOSE (LOWER FIGURE) ON CRANE LAKE  
SASKATCHEWAN

Backgrounds by Hobart Nichols. Birds by Herbert Lang.

## THE WILD GOOSE AND GREBE GROUPS

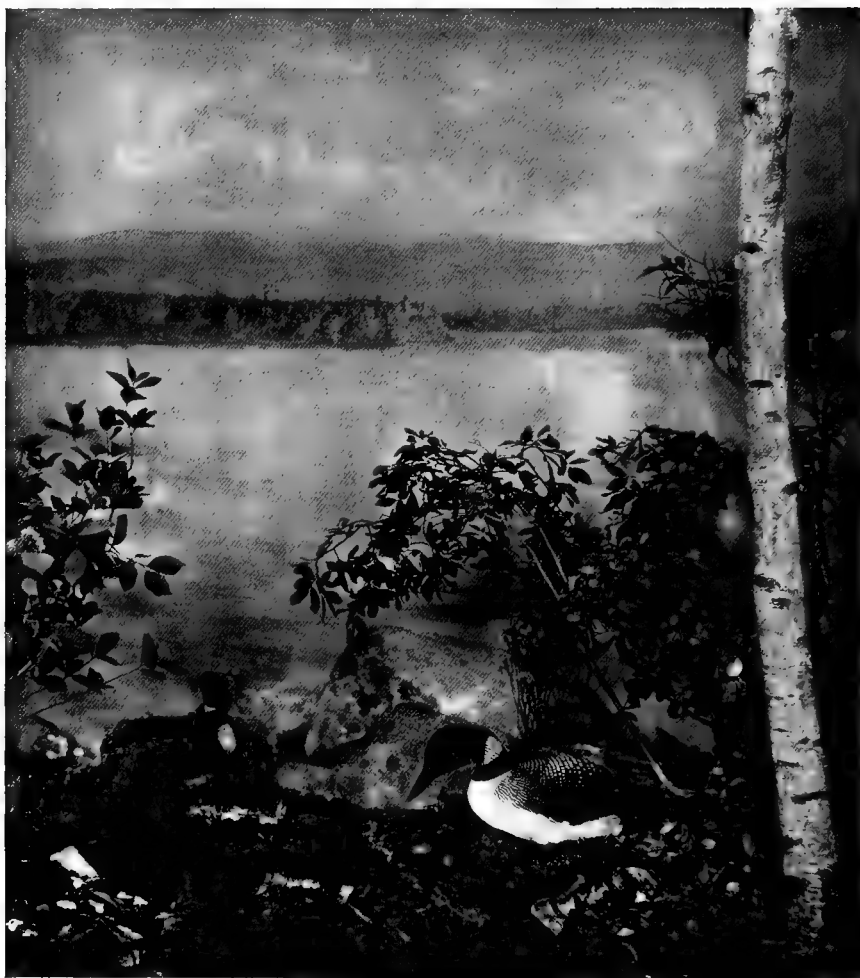
**T**WENTY years ago the lakes and sloughs of our more northern plains and prairies were the breeding homes of vast numbers of wildfowl of many species, but the demands of agriculture have forced the birds to find new haunts north of the Canadian boundary. There, too, if proper protection is not accorded them, they will again be dispossessed by the advance of civilization.

Crane Lake, Saskatchewan, near the line of the Canadian Pacific, where the studies for both the Goose and Grebe groups were made, is typical of many similar resorts of wildfowl in western Canada. In the vicinity of and about the border of sloughs and lakes there nest Willets, Marbled Godwits, Long-billed Curlew, Killdeer, Avocets, Wilson's Phalaropes, Shovelers, Gadwalls, Mallards, Pintails and Blue-winged Teal; while among the reeds and tulés Western and Eared Grebes, Franklin's Gulls, Black Terns, Redhead and Canvas-back Ducks, Ruddy Ducks and Coots build their homes. The Geese resort to islands where also Ring-billed and California Gulls, Common Terns and Pelicans are found. Favorable islands are also selected by Ducks, and on the island shown at the right in the background of the Grebe group, Messrs. Bent and Job estimated that on June 17, 1905, "at least 150 pairs of Ducks were breeding or preparing to breed."

The Wild Geese arrive from the south before the ice leaves the lakes, and lay their eggs early in May. The young birds in the group were taken in June 15, 1907, when they were about two weeks old. Grebes' nests are mere platforms of water-soaked vegetation. These eminently aquatic birds walk with difficulty and their homes must therefore be near the water. They leave the nest at the slightest alarm, but usually first cover their eggs with a part of the nesting material. One of the birds is shown in this act.

The young swim soon after hatching and for a time are carried on the back of the parent.

The background in both groups shows the rolling, treeless plains with, in the Goose group, a line of dune-like sandhills, where, among the low bushes, Sharp-tail Grouse are found.



LOON ON LAKE UMBAGOG

Background by Hobart Nichols.      Birds by Janness Richardson.

## LOON; GREAT NORTHERN DIVER

**L**OONS, like Grebes, are among the most aquatic of birds. All their feeding is done in the water, and their nests are always so placed that the sitting bird can slide quickly into and under the water. They live almost entirely upon fish. These they chase under water, swimming for the most part with the feet alone. Baby loons hatch covered with dense, dusky down, and can swim almost at once. While many Loons spend the winter along shore, often fishing close to the beach, more keep far out, even fifty miles or more from land all the season. When one does come out on land, both bill and wings are used to help the unaccustomed feet.

Though wintering on salt water, the Loon nests largely on the fresh-water lakes of the North, in scattered pairs. There may be heard its wild cry, "one clear, piercing note or a long, quavering, demoniacal laugh, that to the timid suggests a herd of screaming panthers. It is one of the stirring, inspiring sounds in nature." In winter the birds are silent and dressed quietly in brownish-gray above and white below.

This species breeds in the northern part of North America, Europe and Asia, and winters from about the southern edge of its breeding range to southern Lower California, the Gulf Coast, Florida, the Mediterranean Sea and China.



CAMP ON CAY VERDE, BAHAMAS





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