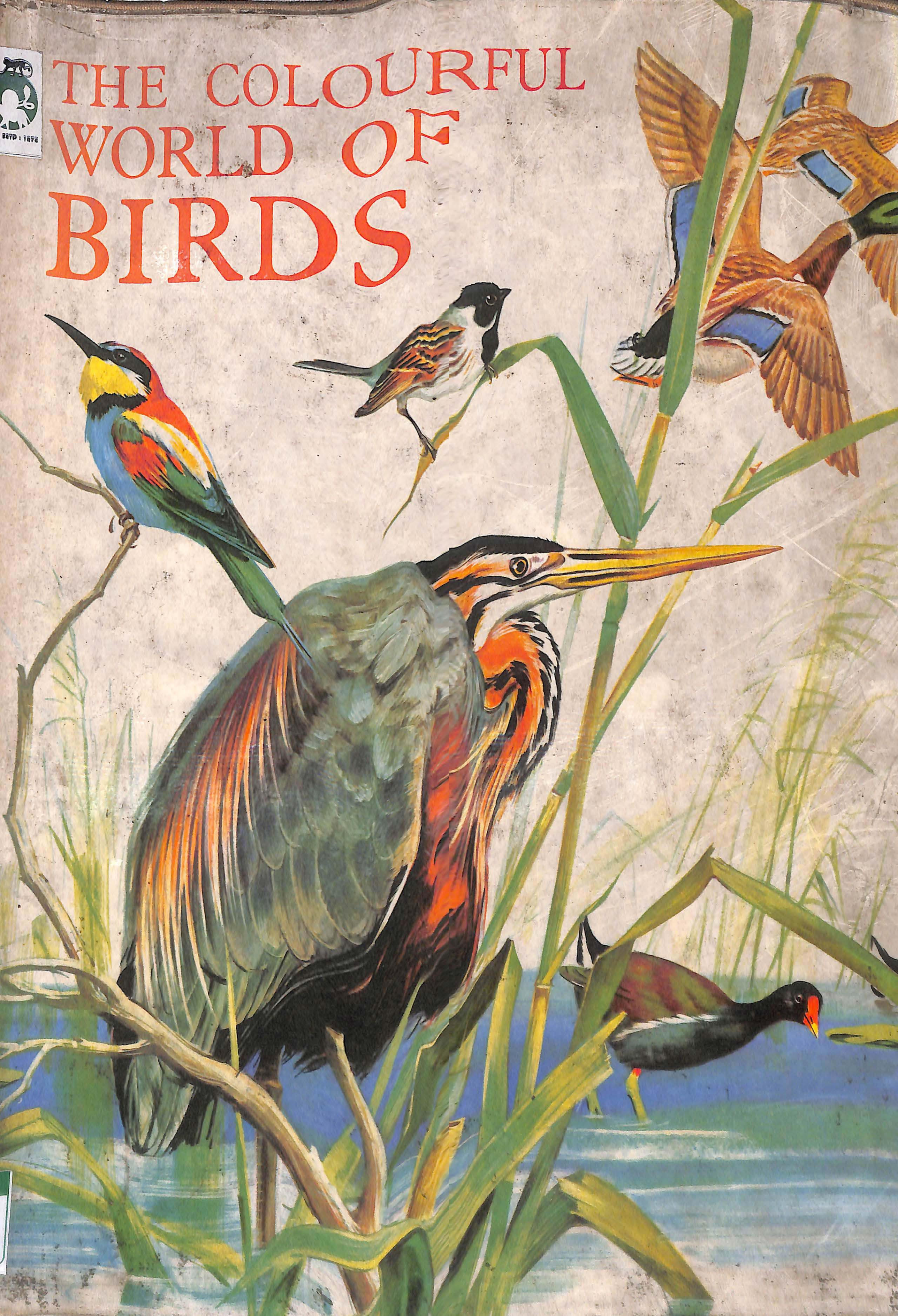
THE COLOURFUL WORLD OF BIRDS



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PAUL HAMLYN · LONDON

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INTRODUCTION

Of all the branches of wildlife, birds are the most popular, partly because they are so beautiful in themselves, and partly because most of them go about by day, rather than by night like most of the mammals, and so are easily seen on country walks.

Just how beautiful birds can be is well illustrated by the exceptionally fine colour pictures in this book. Though many of the most brightly coloured birds are to be seen in Britain only in zoos or collections of cage birds, there are still plenty that people can see for themselves on an ordinary walk. To take just a few examples from the earlier pages of the book, the Magpie, Jay, Robin, Chaffinch, Bullfinch and Redstart are all colourful birds that might be seen on a walk through woodlands in Britain any summer's day. And a visit to one of the numerous collections of wildfowl now on public view — those of Peter Scott's Wildfowl Trust at Slimbridge in Gloucestershire and at Peakirk in Northamptonshire are only the most famous of a growing number — will give you the opportunity of a close-up view of handsome Ducks and Geese, as are to be seen, for instance, on pages 72 and 73.

But this is not just a book of pretty pictures; it contains solid and scientifically accurate information about the life of birds, where they live, the way they find their food, their songs, courtship ceremonies, fantastic migratory journeys, and much else.

You can see much of this, too — if you are observant — on a country walk, and even in town parks and gardens. The extraordinary courtship of the Great Crested Grebe, where the two birds face each other and wag their tippet-adorned heads in unison, can be seen on a hundred lakes, ponds and reservoirs up and down Britain. You can see how the Kestrel hangs in the wind while on the look-out for its prey — mostly mice and voles — in many places from the London parks to the windswept downland and sea-cliffs. The Cuckoo is still a common bird of the English countryside and the Scottish moorlands, and the sight of a small bird, such as a Robin (as on page 59) or a Hedgesparrow or a Meadow Pipit putting food into that huge gullet is not by any means an unusual one for those of you, however young you are, who have learned how to wheedle nature's secrets out of her.

These secrets, incidentally, are yielded up to those who go quietly about the countryside, not talking loudly or whistling or making bangs with guns. Better still is to sit and wait for the birds to come to you.

But I do not wish to give the idea that this is all about British birds. Far from it. Here you will find the birds of the world, from the mightly Eagles and Vultures and grotesque Hornbills and Toucans to the beautiful Birds of Paradise and tiny jewelled Humming-birds. And each seems more marvellous than the last.

Richard Fitter

Where Do Birds Live?

FAMILIAR birds come to our doors to feed: in Europe, Robins and Sparrows, Chaffinches and Blackbirds and in America, Grackles and Chickadees too; in Australia, Kookaburras, Australian Magpies and Bowerbirds, to name only a few. And yet if we mentioned all these birds to a schoolboy from Equatorial Africa, to a little Indian from the forests of the Amazon, or to a young Javanese, they would sound strange, for to these children they would all be exotic birds.

In return, the African negro would tell us of thousands of Waxbills, which he sees in the fields, of Parrots with grey plumage trimmed with red, of Guinea Fowl with dark feathers grey plumage trimmed with red, of Guinea Fowl with dark feathers finely speckled with white, and of quantities of Ducks and long-legged Herons and Storks. The Latin American Indian would talk of Macaws with long balancing tails, of Quetzals in their royal finery, of the Scarlet Ibis which stand out on the sandbanks like scarlet spots, of brilliantly coloured Manakins and of Tinamous and their strange cries. A Javanese would not find it hard to tell us the names of the birds he sees every day outside his hut or in the paddy fields, all of them unknown to many people elsewhere in the world, except for those seen at the zoo.

Because of their successful invasion of the air, birds became distributed all over the globe, from polar regions to the equator. There are roughly 8,600 species of birds which are divided into 25,000 recognisable geographical varieties, with different structural and functional modifications.

Birds are not distributed evenly all over the world. Some of the more easily adaptable ones, like the English Sparrow, can be found in almost any climate. Others, like the shore birds, such as Sandpipers and Plovers, which enliven European beaches in spring and in autumn, cover the entire world in the course of their annual migrations. Still others seem to be found everywhere: in every port of the world we think we see the same Gulls and sea birds, but an expert would be able to distinguish different species from among those birds which at first seem identical.

Many birds are characteristic of a particular part

of the world. Often they are found in very well-defined areas. Birds of Paradise are found in New Guinea, Lyrebirds in Australia and the Toucans only in South America.

There are many more kinds of birds in the tropics than in the cold climates. Hot countries are rich in food for birds: in flowers, fruits and insects all the year round. Birds flourish there and many have never left these favoured regions in which they live. Who, for instance, can imagine seeing a Parrot, or a Hornbill with its enormous beak, or a Curassow anywhere but in a tropical setting?

On the other hand, some birds have adapted themselves to cold countries and even to polar regions. Geese and Swans nest in the far north, where innumerable sea birds, such as Auks, Guillemots and Petrels also live. Antarctica is the kingdom of the Penguins, but other Penguins can be found outside Antarctica as far as on the Galapagos Islands at the equator.

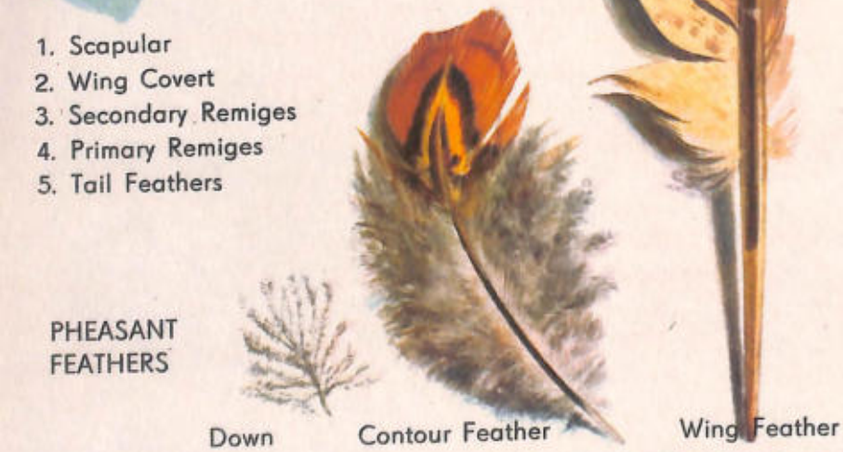
Although most birds live on land, some have chosen the oceans for their home. The Albatross and the Petrel live on the high seas all the year round and come ashore only to lay eggs and bring up their young. That they may be found even in the middle of the ocean shows that every inch of the world may be inhabitable.

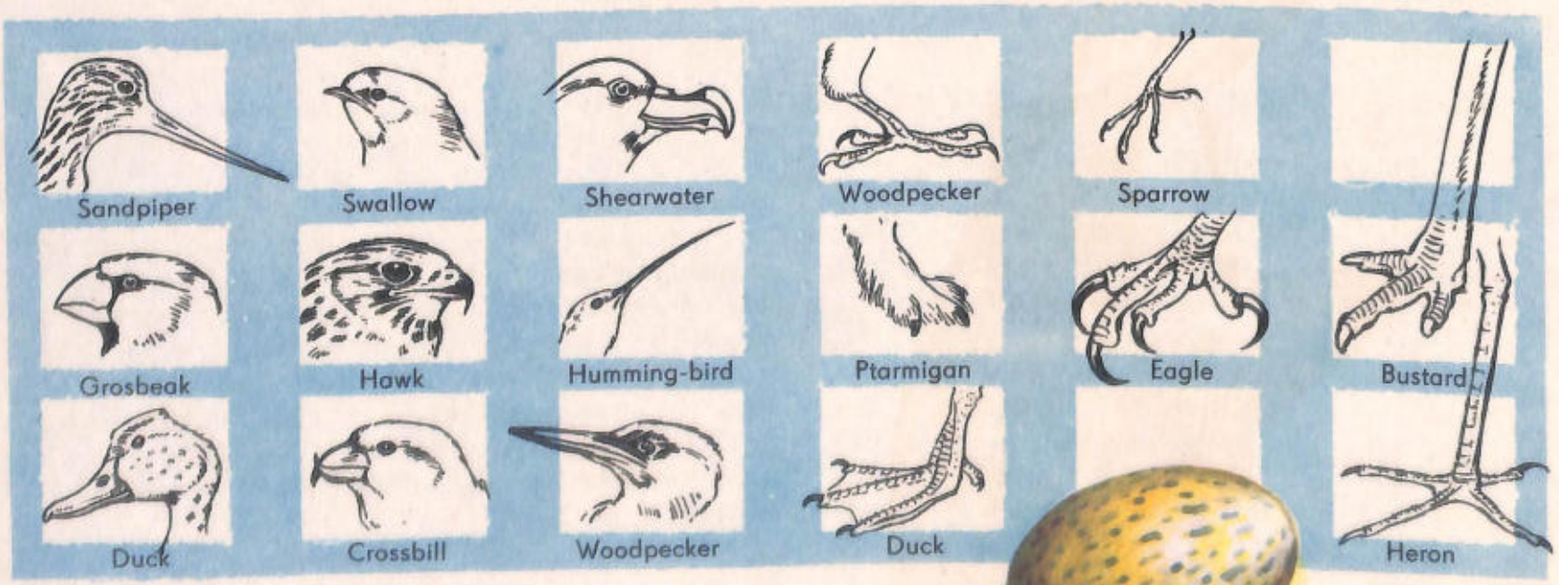
What Is a Bird?

A BIRD is a feathered animal whose bone structure is adapted for flying. Birds are also physiologically constructed for flying. They are warm-blooded, have a high metabolic rate, and have a large, four-chambered heart which separates oxygenated blood from blood carrying body waste.

These small animals have a framework of bone, light but strong. Every bone is hollow to lessen its weight – aluminium alloy tubes are used in building aircraft following this same principle. To this framework are attached the wings, which are modified forelimbs. This 'airfoil', which is like the wing on an aircraft, can also be moved in a complex manner which causes the bird to travel through air. The cross section of a bird's flight feather is convex above and concave beneath. When such a wing section or feather is drawn through the air, the airstream passes more rapidly over the top than underneath because the distance across the top is greater. A suction, or 'lift', is created on the upper surface and this action is the entire basis of flight. One of the first men to discover the principle of flight was the great Italian painter, Leonardo da Vinci. He studied in detail and drew the wings and flight of birds.

1. Scapular
2. Wing Covert
3. Secondary Remiges
4. Primary Remiges
5. Tail Feathers





Crow's Egg

THE WORLD OF BIRDS

THERE are very few places in the whole of our world which have no birds. Only the frozen interior wastes of the Arctic and Antarctic are without some kind of bird life. Even the broad expanses of ocean have the giant Albatross and tiny birds have been found nesting eleven thousand feet high in the Himalayas. Every big town has its population of birds, both resident and casual. We are, perhaps, only aware of the more common town birds — Sparrows and Pigeons especially — but there are always others. Not too long ago one of the aristocrats of the sky, a Peregrine Falcon, took up temporary residence high in St Paul's Cathedral in London and Starlings have proved a positive menace in more than one city.

We take our birds more or less for granted, forgetting what a very large and valuable part they play in our lives. Almost every bird in the world — and there are estimated to be more than eight thousand five hundred species — help us in one way or another. The minute, jewel-like Humming-birds of the tropics serve man by carrying pollen from plant to plant in their search for nectar and even the Starling earns its place in society by eating enormous quantities of grubs and insects from our fields. Someone once said that if all the birds in the world were to vanish suddenly it would only be a short time before man followed. For all the chemical progress that has been made in pest control, it is still the birds who do much to keep us from being overrun by insects.

Luckily today people, not only here but all over the world, are waking up to the beauty and value of birds. Formerly small boys prided themselves on the number of eggs which they stole from nests. Now almost all of us learn more and get even greater pleasure from simply watching and perhaps counting the birds around us.

In Great Britain there are well over two hundred different species. But each year sees some change. A severe winter may bring mass destruction to certain kinds so that several years may pass before we can count on seeing the normal number in the fields or hearing their song from the hedgerows. Others, which have been rare, may suddenly and mysteriously expand their numbers so that we find them everywhere.

With so large a number of birds it is little wonder that more and more people turn to their study every year: study for enjoyment, appreciation and understanding. There are bird clubs and societies throughout the world, with members of all ages brought together by their interest in birds.

A great many centuries ago birds began to learn how to live at peace with man. It is only right that we should be learning about them.

It would be a strange, drab, silent world at best, without birds.

Town Birds

NOTHING seems less favourable to bird life than a great modern town with its busy, paved streets. Yet large numbers of birds have managed to adapt themselves to the new conditions of town living. Some town planners have taken care to reserve parks, often large ones, which are a paradise for birds and ornithologists.

Sparrows are without any doubt the best adapted to life with man, though they have naturally kept their independence. They originally lived in the plains between the Nile and the Caucasus, one of the first sites of agriculture. The Sparrows settled near those early farmers, and later adapted themselves to town life. The development of the motor car could have been fatal to them, however, for they lost the abundant meals horses had provided; certainly the number of birds decreased right away.

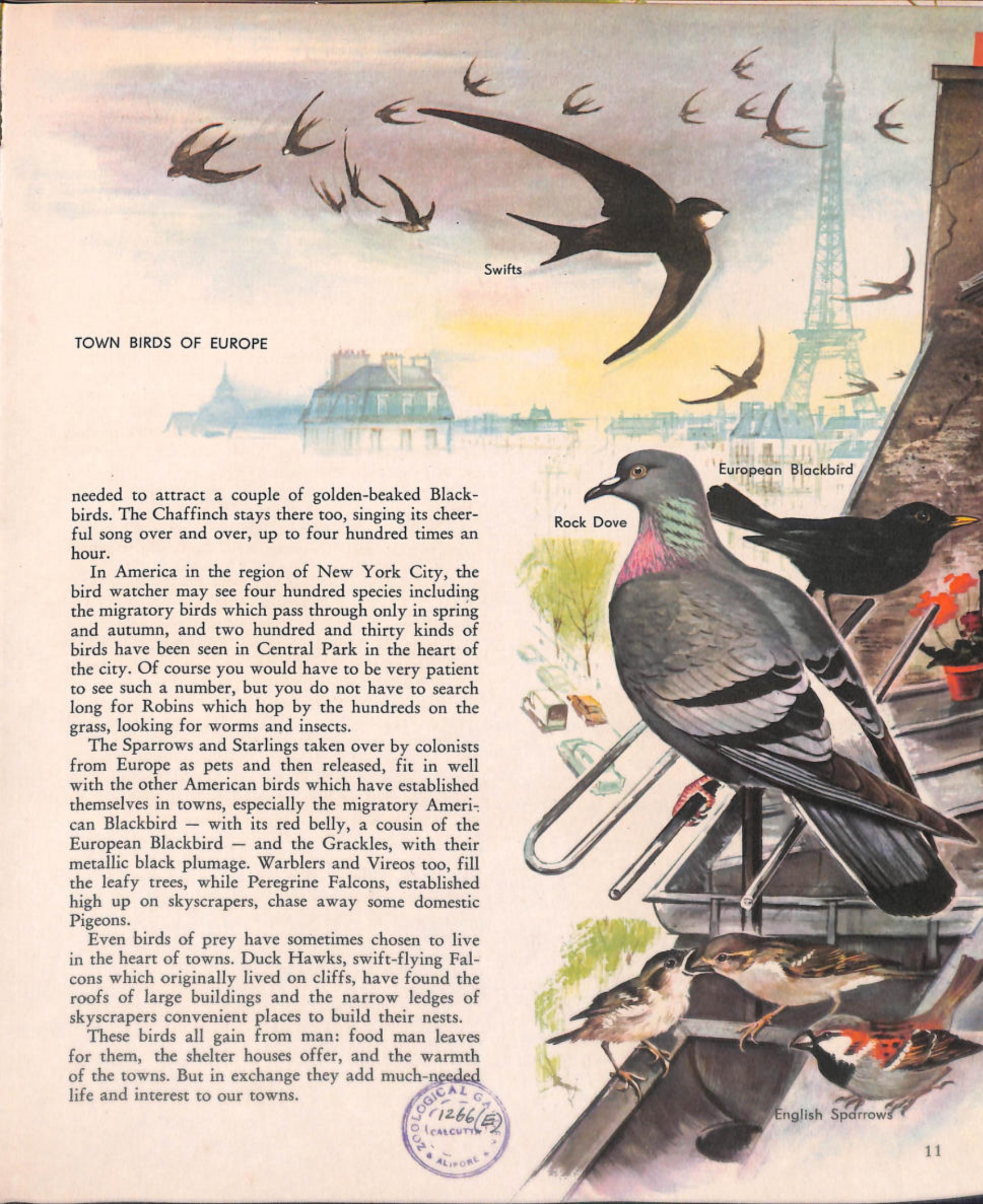
Another true town bird is the Pigeon, which swarms in towns and defaces many buildings and squares. Yet the Pigeon is an elegant bird, and a faithful one who keeps the same mate all its life. Pigeons in Europe have nothing wild left about them, and come from domestic birds which have been freed. The walls of blocks of flats now take the place of the natural cliffs to which the species was once restricted.

In Italy the Pigeons of Venice are part of the fairyland scene of St Mark's Square. There is a legend which says that they are all descended from the Carrier Pigeons which the Republicans of Venice used in the 13th century. Paris Pigeons are perhaps the descendants of those which were tamed in the 18th century by the Bastille's most famous prisoner, Marie Antoinette, who used to attract them to her window to brighten her prison day. And there are the Pigeons of Trafalgar Square in London, known throughout the world and one of the city's special attractions.

Starlings are also numerous in the heart of large towns, using the smallest cavity as a nesting place. And from the month of May town skies are alive with the shrill cries of Swifts.

A row of trees, a town square — nothing more is

TOWN BIRDS OF NORTH AMERICA



TOWN BIRDS OF EUROPE

needed to attract a couple of golden-beaked Blackbirds. The Chaffinch stays there too, singing its cheerful song over and over, up to four hundred times an hour.

In America in the region of New York City, the bird watcher may see four hundred species including the migratory birds which pass through only in spring and autumn, and two hundred and thirty kinds of birds have been seen in Central Park in the heart of the city. Of course you would have to be very patient to see such a number, but you do not have to search long for Robins which hop by the hundreds on the grass, looking for worms and insects.

The Sparrows and Starlings taken over by colonists from Europe as pets and then released, fit in well with the other American birds which have established themselves in towns, especially the migratory American Blackbird — with its red belly, a cousin of the European Blackbird — and the Grackles, with their metallic black plumage. Warblers and Vireos too, fill the leafy trees, while Peregrine Falcons, established high up on skyscrapers, chase away some domestic Pigeons.

Even birds of prey have sometimes chosen to live in the heart of towns. Duck Hawks, swift-flying Falcons which originally lived on cliffs, have found the roofs of large buildings and the narrow ledges of skyscrapers convenient places to build their nests.

These birds all gain from man: food man leaves for them, the shelter houses offer, and the warmth of the towns. But in exchange they add much-needed life and interest to our towns.

GARDEN BIRDS OF EUROPE

Garden Birds

KINGS and princes used to go to great expense to keep menageries where they reared costly tropical birds. Peacocks brightened royal parks with their brilliant plumage. Today, for those of us who know when and how to look, menageries rivalling those of the great men of the world can be found in and near our own gardens.

To take advantage of the possibilities our surroundings afford, we should get up at dawn with the birds and enjoy the concert which greets the rising sun. At our door we may find a flock of Tits searching the branches of a tree for insects, caterpillars or delicious young shoots. A whistle may bring them quite close without their showing the slightest fear.

A Redstart, the loveliest of European birds, may be sitting on a post, showing off its orange breast, black face and the red tail which gives it its name. Its song is one of the most tuneful and easily picked out by its flutey beginning followed by a warble.

In a hedge sits a tiny bird, no more than a little ball of brown feathers, with a stumpy upturned tail: it is the Common Wren, one of the smallest of European birds. Only the male sings its shrill trilling song as it moves over its territory, going from one of its nests to the other. This dwarf bird is in some regions polygamous and has several mates successively, each of which it installs in a big ball of moss and twigs. The extent to which it is polygamous depends on the food supply and so there is less and less polygamy to the north. In one season the same bird may build up to a dozen nests — fantastic work for a bird which weighs so little.

Warblers of all kinds babble in the trees, especially the Blackcaps, the male with its brilliant black cap and the female with a reddish-brown cap, both birds quickly betrayed by their movement and voices. Farther on an Oriole is singing, and the thistles have attracted some Goldfinches or Thistlefinches, so called because of their ability to extract the seeds from the thistle heads.

The colonists of North America were not disappointed by the birds of the New World. The most distinguished American bird is the Cardinal. The male is a magnificent red, while the more reserved mate is of a much browner colour. When on the move, this

GARDEN BIRDS OF NORTH AMERICA

bird looks like a flame darting through the trees. Its beauty fully justifies the poems and books which have been dedicated to it. Cage-bird lovers in all parts of the world will go to great pains to rear this bird in captivity.

Yellow Warblers sing among the leaves. There are Yellow-Throated Vireos, Goldfinches, Scarlet Tanagers — and the Tyrants, too, whose name comes from their difficult temperament and who feed on insects as do the Flycatchers. Bluebirds and Orioles return to the orchards in the spring.

Many other birds may come to our gardens everywhere, so we have no excuse for not becoming bird watchers. It is no use arguing that we have neither the time nor the means to go to distant places. In our own gardens and parks there are as many secrets to be uncovered as we could wish for to fill a lifetime.

Forest Birds

FOREST BIRDS OF NORTH AMERICA

FORESTS are secretive places. Their dense foliage shelters activities which are hidden from prying eyes. Yet forests are full of birds which betray their presence by their singing.

One of the best-loved forest birds is the Robin Redbreast. It is also a gifted singer, and yet a belligerent little bird, which tries to intimidate its rival Redbreasts by striking bullying attitudes and then rushing at them. It has been proved that it is the red colour which provokes the bird, for the Robin Redbreast will throw itself at a tuft of red feathers or at a piece of red cloth. In the winter the Robin abandons the forest.

Many forest birds cling to tree trunks. The Woodpecker has an especially good grip: two claws face forwards and two backwards to give a tight hold on to the bark and its rigid tail gives it extra support. The whole forest echoes with noise as they hammer the bark with their beaks. American Sapsuckers feed on sap drawn from the trunks through a hole drilled with their strong beaks.

The Nuthatch is even more agile than the Woodpecker, and it is the only bird which can run down a tree trunk as well as up: it runs up and down like a mouse. The Woodpecker flies down each time.

Woodpeckers are also found in North American forests, and the Blue Jay — cousin of the European Crow — which inspires terror in little birds, eating their eggs and young. Other birds are not known in Europe, like the Ovenbird, the American Redstart, the Red-eyed Vireo and two wonderful songbirds, the Veery and the Hermit Thrush. The Veery sings a whistled melody which becomes softer and softer, while the song of the Hermit Thrush is rivalled only by that of the Nightingale of Europe. The Ovenbird is a songbird too, with a call on two notes which sounds like 'teacher, teacher'. Most passerines or songbirds

FOREST BIRDS OF EUROPE

move in little hops, but the Ovenbird walks with a measured gait, shaking its tail as it goes.

The treetops and dense foliage are the home of a large family of Warblers. One of the most easily recognisable is the Black-and-White Warbler. Like a Tree Creeper or a Nuthatch, it spends most of its time looking for insects in the bark of the tree trunks and branches.

Forest birds often nest in hollow trees. Others hide their nests among the branches. One small bird, the Golden Grested Wren, nests there and does not even migrate but spends the entire winter in the pines without showing the slightest discomfort. There is a legend which says that this little Wren allows the pine tree to stay green all the year in gratitude for the shelter it gives in winter and that the other trees lose their leaves once a year because long ago they chased it away from among their branches.

Birds of the Fields

In autumn large flocks of Rooks gather on the open fields. These soberly dressed black birds are not very distinguished in appearance. Their dark plumage has only a slight metallic gloss to brighten it. Remarkable for their intellingence, rather than their beauty, they are among the most cunning of all birds.

Their flocks are so finely organised that they even provide 'police protection'. While the flock is busy on the plains searching for food — for insects, grain, young plants, and various kinds of refuse — sentinels are posted at strategic points. These lookouts warn their companions of the approach of any suspect, and if there is real danger, the whole flock takes off. It is almost impossible for man, or dog, or any other large animal to come near a flock of Rooks. The same precautions are taken in the evening when the flock rests in the trees. In one roost alone there may be thousands of birds.

Rooks have a very rich vocabulary. Whereas we can hear only an unmusical cawing, Rooks in fact make a great variety of different sounds, each one having a special meaning. The cawing of Rooks has been recorded for experiments and then carefully analysed. These recordings are sometimes played back through amplifiers near a group of Rooks. If the cry played back is the distress signal of a sentinel Rook

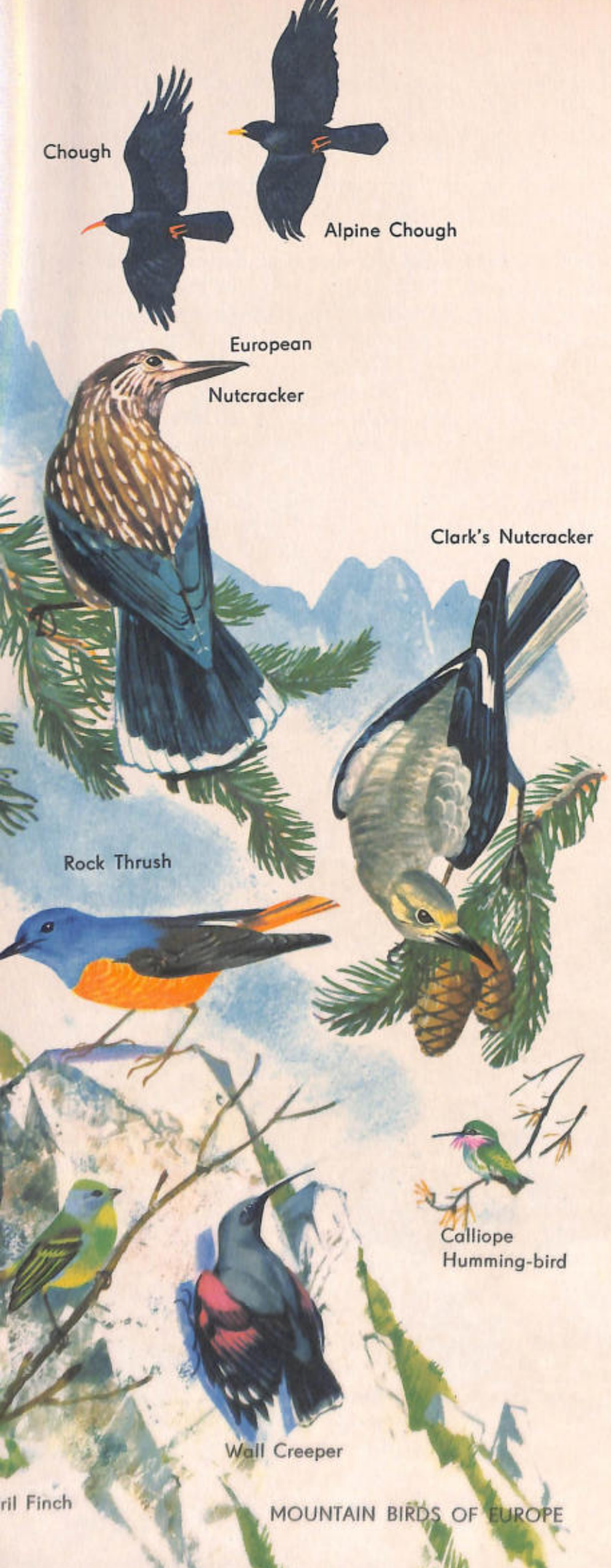
which has sighted an enemy, the flock immediately flies off.

A similar intelligence is noticeable in their cousins, the Magpies. These birds are useful as they kill rodents and some insects harmful to agriculture, but they are also guilty of certain crimes. They are thieves and plunderers of nests. They sometimes eat other bird's eggs and defenseless fledglings, and even prey on chicken in farmyards. Farmers try to check their numbers.

Plains, whether open country or fields broken up by hedges, are the paradise of game-bird hunters. One of the best-known game birds is the Patridge. They search the fields for seeds and for insects which crawl on the ground. And it is there that they nest, laying their eggs, up to twenty, on the ground. Later their numerous offspring need constant care and attention.

The Pheasant, which is now an integral part of European life, is in reality an intruder: it was introduced to Europe by the Greeks and Romans. And since that time the Pheasants have been the joy of sportsmen, who breed and preserve them at great cost.

The Bobwhite is an American bird, but can now be seen in the fields of Europe, imported by hunters. In return European birds have been taken over to North America: the most successful has been the Ring-Necked Pheasant. George Washington asked General Lafayette to bring from France pairs of Pheasants for breeding in America. Since that time, they have settled happily in a large area, from New England to Oregon.



MOUNTAIN BIRDS OF EUROPE

Mountain Birds

Some birds have made their homes in the mountains. Here they find the food and shelter they need. Mountains are a safe refuge for birds; they can escape from man more easily than in the lowlands. Peace-loving birds move to higher ground to join the true mountain dwellers.

It is there that you find the Eagle, king of birds. Since ancient times men have worshipped the Eagle and been inspired by its courage and noble bearing.

Eagles eat small mammals, such as mountain hares and marmots as well as birds, but they seldom fly off with chickens as people suppose, nor with lambs or young children as some stories say.

The keen eyesight of the Eagle is proverbial. Like many birds of prey, it has large eyes. Its eyes weigh more than its brain and combine the faculties of the microscope and the telescope. Calculations have been made showing that the Eagle can see a hundred times better than man. Some birds of prey can pick out from more than a mile off a ball of feathers fluttering on the end of a piece of string. A man could not do this even if he used binoculars. But Eagles have to be able to do more than merely sight the prey. By bracing their wings they must swoop down on their prey, quickly seize it, and carry it off to their eaglets.

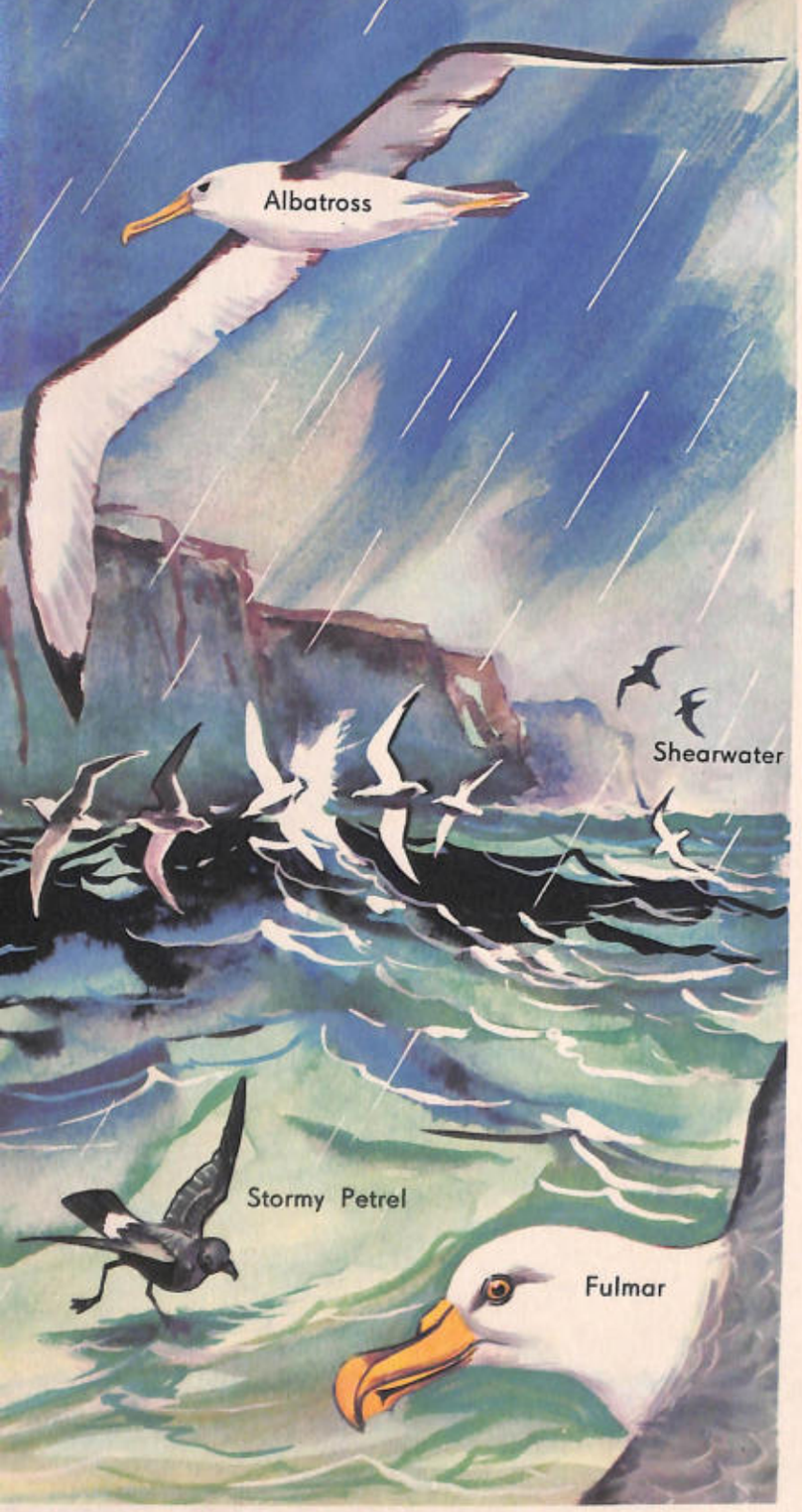
Many smaller birds inhabit mountainous country. In the coniferous forests of the great western mountains of North America live the Nutcrackers, cousins of the Crows, which have grey feathers and contrasting black wings. These birds are often seen around mountain hotels and chalets. During the summer they eat anything they find, but when winter comes, their principal food is the seeds of fir trees. They carefully collect fir cones and extract the seeds hidden between the scales, noisily displaying their satisfaction.

Birds are numerous on mountainous ground, and the height at which they can live is limited only by the vegetation available. One of the smallest Humming-birds, the Calliope Humming-bird, has been seen at an altitude of ten thousand feet. It is more often found lower down on the edge of cone-bearing forests and mountain grasslands, where it helps itself to nectar from lupines, elephant heads, and other flowers which

bloom when the snow has melted. The Red-Faced Warbler has been seen as high as eight thousand feet up on sunny slopes in North America. Its favourite insect hunting ground is the tops of fir trees, where it may meet many other birds, particularly Cassin's Finch.

The mountains are the home of the Choughs, too, who love to dive and spin in the sky, of the yellow-beaked Alpine Chough and of the Wall Creeper, a rock bird who likes vertical cliffs and warm flat stones where it feeds on insects.

Golden Eagle



Ocean Birds

THE sea, which covers three quarters of the world's surface, is full of animal life, from the smallest particle of plankton to enormous whales. It is not surprising, therefore, to find many sea birds taking advantage of this great food store.

The Albatross is the unrivalled king of the sea. One species has a wing span of twelve feet, making it the largest of all flying birds. To take off, the Albatross runs on the surface of the water, but once airborne it can fly with the greatest ease. It can also plane like a glider, without flapping its wings. The best adapted of birds to marine life, Albatrosses go ashore only to build their nests, almost always on remote oceanic islands, especially those of the southern ocean.

Except for Petrels and certain of the Gulls, most other birds stay near the shore where fish is abundant and the waves throw up refuse from passing ships. The Blackheaded Gull, with its summer cap of black feathers, lives there, but has even followed man inland and is as often met on the Swiss lakes as on the riverbanks in Europe.

The Herring Gull, its strong yellow beak trimmed with a bright red splash, is one of the most common birds along the shores of Europe. Thanks to its adaptability, intelligence and vigour (it has been known to live as long as forty years in captivity) it is able to use almost everything thrown up by the sea, but it is also a plunderer, swallowing eggs and gobbling up baby birds when given the chance.

These habits can be seen more strongly developed in a group of birds which specialise in stealing. They are the Jaegers and Skuas, whose drab dress helps them to carry out their shady deeds. Not content with robbing nests, they look for a Tern which has just caught a fish, swoop down on the happy hunter, and pursue it mercilessly until it surrenders its catch. When the Tern gives up and lets go, the pirate bird quickly catches the prey before it drops into the sea.

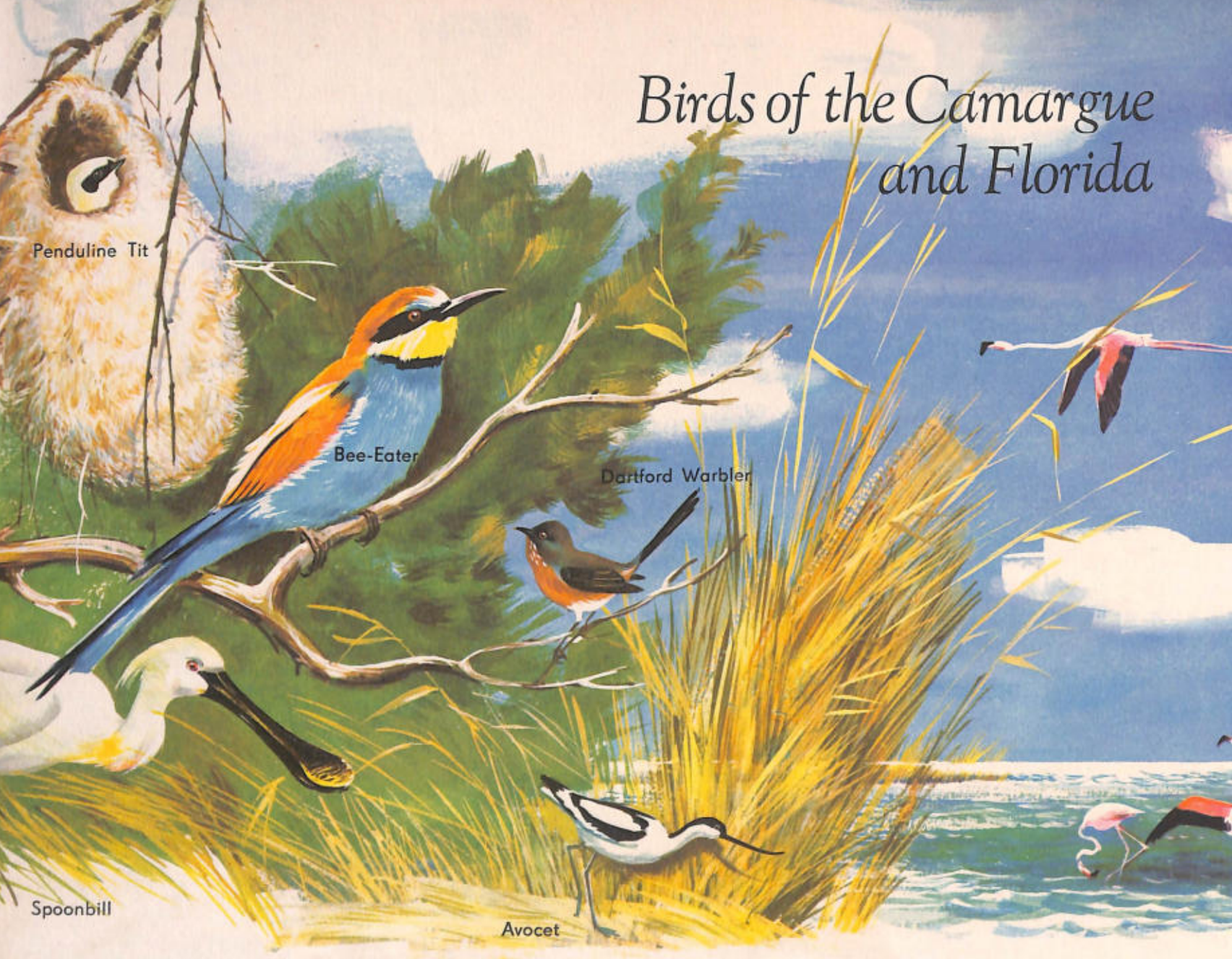
During autumn, the deserted beaches are invaded by thousands of migrants. These little waders have left the Far North and are on their way to milder regions. They descend along the beaches in vast numbers. With hurried steps, Sandpipers and Plovers and other species of shore birds explore the beaches in search of food. When looking for a meal, some shore birds turn pebbles over with their beaks, and one of them thus earned its name of Turnstone.

Another beach invader, the Oyster Catcher, prefers molluscs which it can pick up and pry open with its flattened beak that looks somewhat like an oyster knife.

By feeding continually at the water's edge, birds of the seashore make sure that none of the riches of the sea are wasted when deposited on land. They are fortunate, for every tide replenishes their food supply.


Arctic Skua
Herring Gull
Black-Headed Gull
Sandpiper
Curlew
Black-Bellied Plover
Common Tern
Black-Headed Gull
Oyster Catcher
Turnstone

Birds of the Camargue and Florida



In the south of France there is a sunny stretch of country where fresh water and salt water intermingle with sand and mud. This is the Camargue, the triangle of land formed by the two branches of the River Rhône. The area has long been the home of herds of wild bulls and horses. Today rice is grown there, adding to the exotic character of this curious region. But the Camargue is above all the land of Flamingos.

The Flamingo is a rich-looking bird. Its feathers look rose pink when it is standing still but when it is in flight it is a living flame: the underside of the wings is bright salmon pink touched with black.

These wading birds stand from four to six feet tall. Their heads are set on long, slender necks. Balancing themselves on long legs, they probe the mud with angular beaks, equipped with a sort of horny filter, and, turning their heads upside down, they suck up little salt-water shrimps. Flamingos gather in breeding 'towns' beside open salt-water lagoons. To build a nest, the Flamingo scoops up mud and sculpts a pedestal for its single egg to protect it from any sudden rising of the waters.

Marshes make the Camargue a paradise for other wading birds. Grey Herons, White Egrets and Night Herons with their black caps, adorn the stretches of water, as does the Avocet, a little black-and-white wading bird with a long beak like an upturned sickle. Countless small passerines live among the delicate-leaved tamarisk, the saltwort and the sweet-smelling bushes; the Penduline Tit patiently collects material to build its purse-like nest, the Dartford Warblers spend most of their time in hiding. The sides of enormous sand dunes are hollowed out by colonies

of Bee-Eaters for their nests. These nests are tunnels more than three feet deep in which the young birds are sheltered from sun and rain. The brilliantly coloured Bee-Eaters are African invaders which have settled in Europe.

America, too, offers to nature lovers stretches of marshy land where nest thousands of birds, and the islands along the coast provide a spectacle equal to that of the Rhône delta. Thousands of white Ibis, of Glossy Ibis with bronze feathers, of pink Spoonbills, come to the south-west of the United States to join innumerable Herons of all types, from the tall Egret to the Little Bittern, no bigger than a Magpie. All the birds build their nests on low trees, in town-like groups among the branches, on which these waders perch rather awkwardly, for their long feet are more useful for exploring the expanses of shallow water.

Flamingo

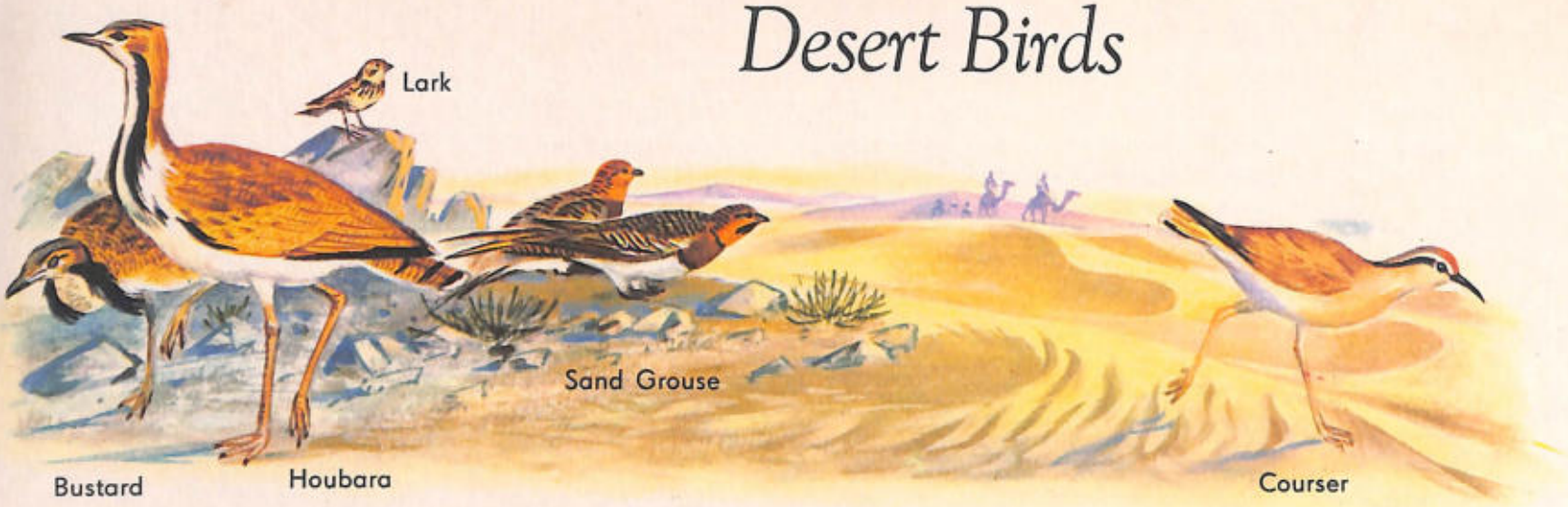
African Birds

MUCH of the continent of Africa was unexplored two thousand years ago. There were many legends among the Greeks and Romans. They believed it was a pillar supporting the heavens and that a race of mysterious winged people lived there. If Aristotle could have visited Africa, he would have been amazed to discover a lake in Equatorial Africa.

There, he would have seen the Crowned Crane. This bird, its head adorned with a crown-like crest, is king of this richly coloured world. Aristotle would also have seen Pelicans, comic-looking on land, and yet surprisingly majestic when they take flight and glide in the sun. Pelicans fly well, yet they do not seem to want to wander far from the shores on which they breed: around swampy districts, by inland lakes and rivers, and the tidal waters of the ocean.

In Africa nature has given full rein to her imagination. The Shoebill owes its name to a monstrous beak swollen into the form of a shoe. The Skimmer — a cousin of the Terns — has a beak with which it skims the water in search of tiny animals which float on the surface of rivers and ponds. Its beak is flattened sideways like a pair of scissors. The African Skimmer lives only near fresh water and particularly besides rivers.

Desert Birds



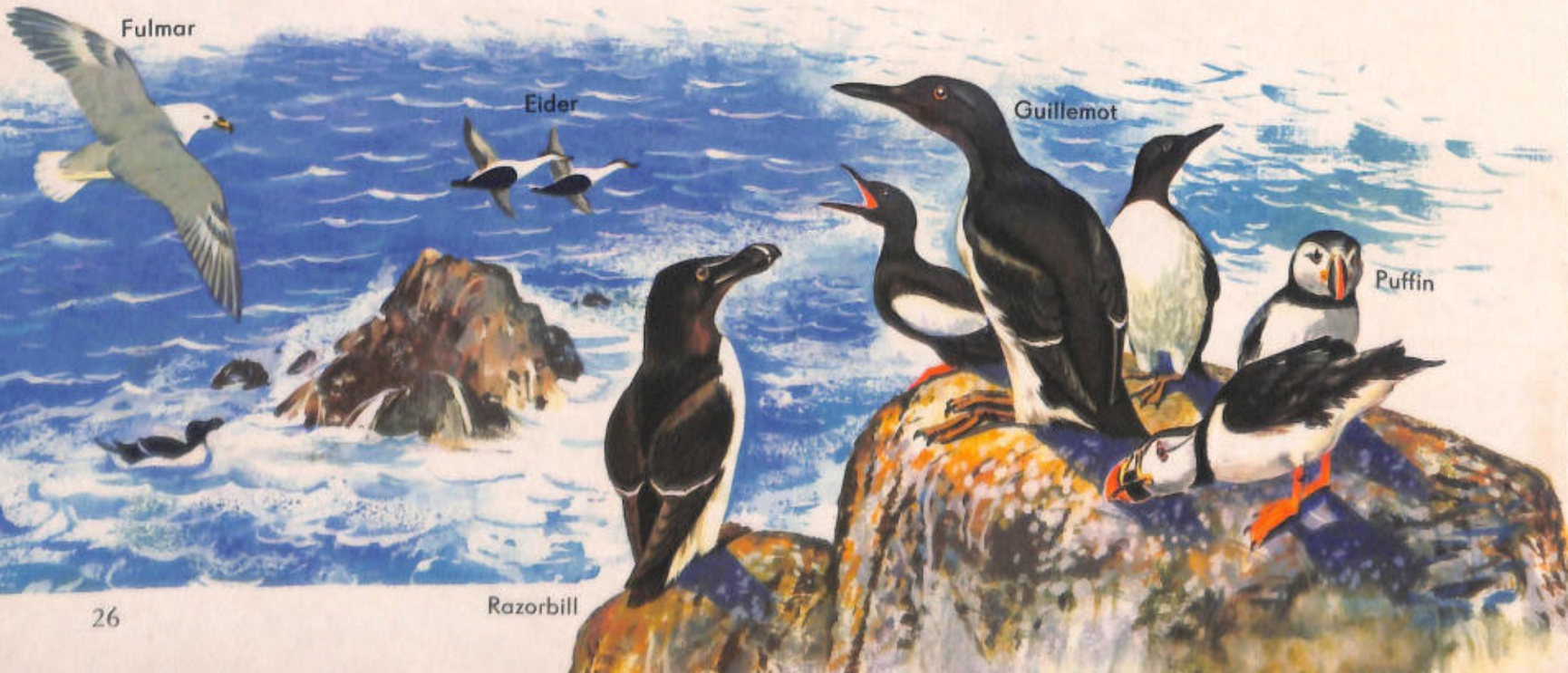
When a caravan stops at a resting place in the middle of the Sahara, there is nothing around but sand and pebbles. Dry and continously swept by trade winds, the desert is bleak and inhospitable, so much so that the traveller is surprised at the appearance of several birds whose very existence in such a barren place seems miraculous.

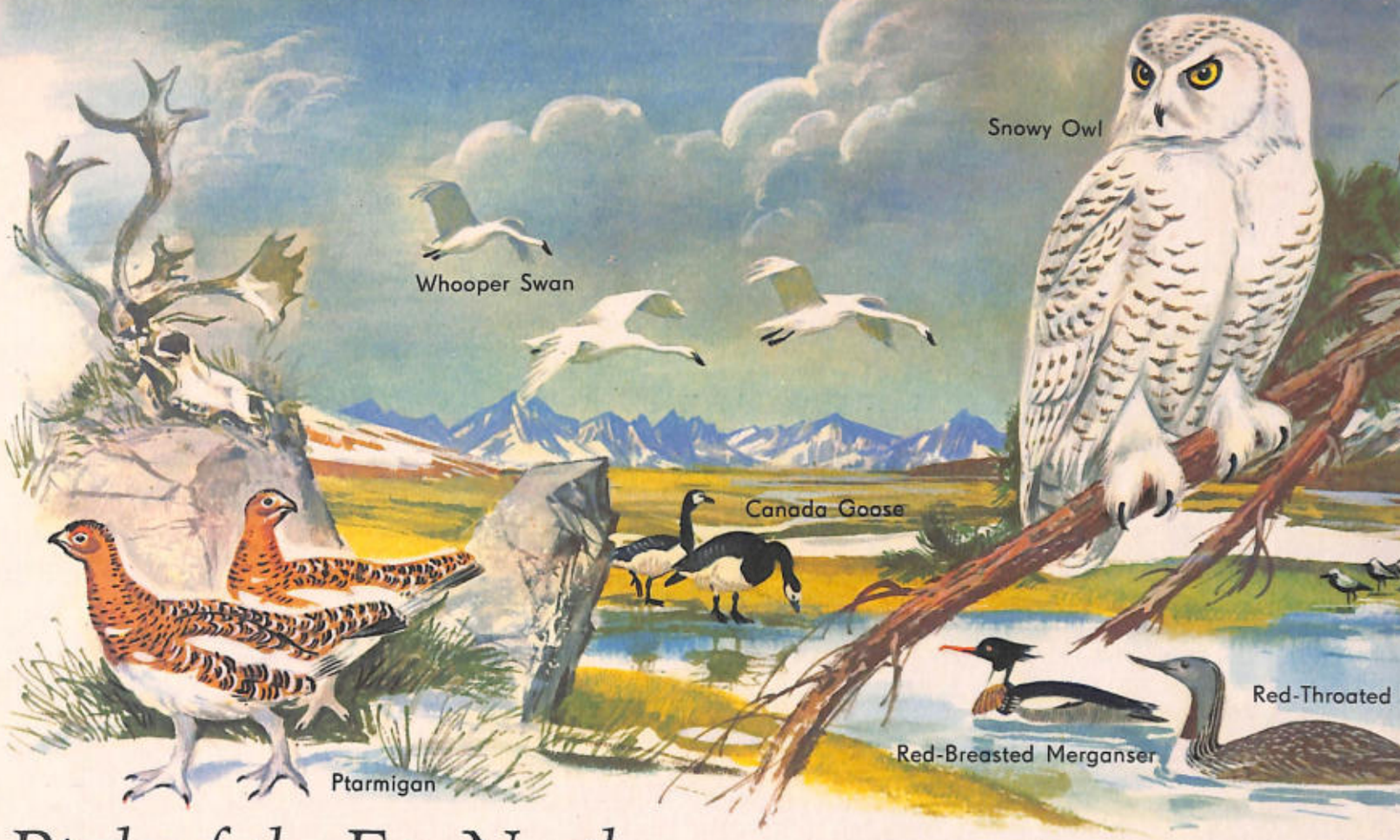
For the small birds of the open desert one of the greatest problems is to find hiding places, for birds of prey are not rare here and can hunt more easily because their victims have nowhere to hide.

The hunted have adopted an effective camouflage. Most desert birds are sand-coloured or light grey. Whether they are Larks, Sandgrouse, Coursers, or Bustards, their plumage blends effectively with the colour of their surroundings. Their best safeguard is, therefore, to crouch in a hole beside a stone.

The Bustard is a heavy bird which cannot fly well, but in addition to its colouring it can rely on its running ability to escape a pursuer's clutch. The little Lark, which also runs instead of hopping, prefers to bathe in dust rather than water. Nests of these birds are simply holes scooped out in the sand, perhaps at the base of a shrub.

Other birds in the Sahara have adopted an opposite technique in self-preservation. Some birds, like the Mourning Chat and the White-Rumped Black Chat, both cousins of the Wheatear, are vividly marked with black and white. When these birds are flying the pattern on their wings may be clearly seen. They have a most unpleasant taste, and by their colours they seem to be warning their enemies of this.





Birds of the Far North

The Land of the Midnight Sun is one of the strangest places in the world. An icy desert in winter, it comes to life only when the snow melts in the valleys. Summer is brief and life seems more intense because the fine days are numbered. Flowers take only a few hours to grow and transform the landscape.

The cold waters of the region are rich with fish, and sea birds are the most numerous here. Among them are Gulls, Terns, Fulmars, Auks, and Guillemots. When their appetites are satisfied, these birds rest on the narrowest cliff ledges, and in spring Guillemots lay their pear-shaped eggs on the bare rocks, without building nests. The pointed oval form of their eggs prevents them from rolling off; if dislodged, they spin around their pointed ends and thus remain perfectly balanced even on a steeply sloping surface. Guillemots are extremely faithful to their breeding sites; the return to the same spot year after year. At about two weeks old, the young flutter down and take to the sea in the company of their parents.

As soon as the tundra lakes have melted, the Arctic Divers appear. The call of the Common Diver, a long, far-carrying, plaintive cry, is for all who have heard it, unforgettable. These birds are called Divers because diving is their habitual method of feeding. They swim with ease, sometimes sinking up to their long periscope-like necks in the water. They move clumsily and awkwardly on land, for their legs are encased within their bodies down to the ankle joints. For this reason they must take off from the water rather than the land. They cover a great distance when doing so, but once airborne are excellent fliers.

The Snowy Owls, great Owls with white feathers striped with black, feed on lemmings, small rodents which breed in large numbers in the Arctic. They are sometimes so numerous that they look like tiny armies on the march, providing inviting feasts. Since daylight is continuous above the Arctic Circle in summer, Snowy Owls are necessarily daylight hunters.

But winter soon returns to the Far North. The cold drives the birds out of this now inhospitable land. Only the Ptarmigans remain, hollowing out dwellings for themselves in the thick white carpet where they live like Eskimos in igloos. They move about under the icy crust through galleries where they store berries and shoots under a thick layer of snow. Their pure white, winter feathers make them invisible to animals who would eat them. Ptarmigans are unique in having completely feathered toes, enabling them to walk in soft snow. They are a form of Grouse and when spring returns their plumage turns progressively brownish and grouselike, only the feathers of the legs and parts of the wings remaining white in summer.

Condor

Hunting Rhea in Argentina

South American Birds

WHEN the plundering *conquistadores* landed in South America, they were seeking gold and precious stones. Whether successful or not in their quest for material riches, they could not help observing the wonders of nature. Returning to Spain, they told tales of extraordinary animals and wonderful birds, for nowhere else are birds so richly coloured as in the lowland forests of the Amazon.

Dozens of different kinds of Humming-birds sparkle like precious stones. Manakins, Cocks of the Rock, Trogons and Tanagers make colourful splashes in the forest. Tinamous can be heard talking in pairs. The air rings with the strange call of the Cotinga and the grave voice of the Bellbird. But the most characteristic sounds of the forest are the harsh cries of Parrots. When hunting, they work in partnership with other birds, particularly Toucans, and even with monkeys, so as to exploit together the resources of the forest. Little birds follow behind these hunters, eating insects disturbed by their movements.

Leaving the hot, wet lowlands and climbing the slopes of the Andes, the high plateaux are reached, which, at sixteen thousand feet, make up the highest region in the world inhabited by man.

This is the country of the Condor, the bird king of the Andes, which has a wing span of up to ten feet. The Indians have made this bird a god, representing the spirit of the mountains, but all the same they capture these birds on certain occasions using very special methods. One of the most interesting consists of digging a ditch and then covering it with branches on which an animal's carcass is placed. The hunter hides in the ditch and waits for a Condor to come and take the bait. While the bird has its attention on the food the hunter grasps it by the feet.

The gauchos, or cowboys, of Argentina have a different method for hunting the Rhea, cousin of the Ostrich, a bird confined to the unforested parts of South America. Like the Ostrich, the Rhea cannot fly but is a very fast runner. These tough horsemen use bolas, fibre thongs weighted at one end with stones, which they whirl like lassos, throwing them at and entangling the bird's three-toed feet. The Toucan, along with the Hornbill, is considered to be the bird with the largest size of beak proportionate to body size. Most of the beak is hollow and not as heavy as it appears to be. Toucans are gregarious birds, are easily tamed and make delightful pets. Their flesh is eaten in South America.


Sun Parakeet
Quetzal
Toucan
Scarlet Macaw
Hoatzin

Australian Birds

A pair of Budgerigars

One of the oddest and most magnificent birds of Australia is the Lyrebird. The name comes from the bird's long tail which when at rest has the form of a lyre. The two very thick exterior feathers look like the wood of a lyre while the inside feathers are finer and long and slender like the instrument's strings. The lyre-shaped tail is characteristic only of the male. It is used to attract a mate, for whom the male promenades in majestic poses, opening and closing the rich tail feathers, which can be folded up over the back. This gorgeous bird can imitate about fifteen different kinds of birds whose voices it has heard in the forest.

Throughout the Australian bush a curious laughing sound can be heard. It is the language of the Laughing Jackass which still keeps its aboriginal name of Kookaburra. About the size of a Magpie, this bird has a strange, ringing cry rather like a rude human laugh, which it utters with great regularity at dawn and dusk. The Laughing Jackass, which is a Kingfisher, is often seen beside water, but it is actually a land bird. It prefers snakes and lizards, insects and even young chickens or ducklings which it steals from farmyards, but it eats fish as well.

Australia has given us some of our most familiar cage birds, in particular the graceful Budgerigars or Parakeets. These birds are green in the natural state but by interbreeding man has modified the colours and produced beautiful chartreuse, white, blue-purple, and pale yellow birds. The pretty Budgerigar is a very popular indoor cage bird. It becomes a most enganging cage pet if given a lot of attention. It can become a good talker with a large vocabulary if it hears words repeated often enough.

Laughing Jackass

(Kookaburra)

Lyrebird

HOW DO BIRDS LIVE ?

A MAN can survive for several weeks without eating, for his body has reserves which enable him to survive. Some birds come under this category, too. An Eagle can fast for nearly a month without suffering seriously, and a hen for about ten days. However, most birds die after going without food for only a little time. Some small birds die just a few hours after their digestive tracts have been emptied.

Birds are extremely active creatures. Whereas the normal human heart beats seventy times a minute, the Duck's heart beats two hundred times, the Hen's heart 312 times, and that of the Sparrow 460 times. Heart-beats of small birds can exceed one thousand per minute in flight. If we took a bird's temperature we would think it was feverish. As an example, the thermometer would indicate a normal 113 °F (45 °C) for the Robin and the Sparrow Hawk. Matching the efficiency of this system is the rate of food consumption which may be eighty per cent of the body weight daily.

This can be explained by comparing a living creature to an automobile. The faster the car is driven, the more petrol and oil it uses. Birds are rather like highspeed cars. A great amount of energy is needed for flying and for other activities.

A bird must therefore eat very frequently. Before dawn birds begin looking for food, and they do not rest until sunset, as a huge quantity of food is necessary to satisfy them. Each day a Warbler eats its weight in insects. Gannets and Cormorants can eat from four to seven pounds of fish daily, the equivalent of their own weight. Sandpipers, which search so avidly for little sea creatures, also need to eat their own weight in food. Humming-birds feed chiefly on nectar from flowers and may take in every day an amount equal to twice their weight.

A bird spends most of its life looking for food, though the urgency of the search is not the same for all species. Birds of prey, whose opportunities for feeding are necessarily haphazard, go without eating on some days, just as lions do. Shrikes think of the future and store some of their victims, grasshoppers or small lizards, by impaling them on the thorns of trees. Some Woodpeckers make holes in trees where they hide seeds which they feed on later. These larders are very welcome in days on need. Most other birds, however, live from day to day. The daily success of their hunting and gathering is a matter of life and death for each one of them.

The length of a bird's life varies. Birds in captivity have been known to reach the following ages: an Owl, sixty-eight, an Eagle, fifty-five, a Condor, fifty-two, and a Pelican, fifty-one years. There have been cases of a Cardinal thirty years old, a Sparrow of twenty-three and a Canary of twenty-two — all caged birds.

Swallow

Insect Hunters

Let us imagine that we could count every land animal in the world. Insects would far outnumber any other kind because of the almost unbelievable rate at which they multiply. Their eggs are laid by the millions and their generations succeed one another very rapidly. The world would be a seething mass of insects if they were not hunted by other animals who reduce their numbers.

Some insects are useful, but many others are very harmful, particularly to crops and harvests. Nature has provided ways of fighting this constant menace, and insect-eating birds destroy huge quantities of harmful insects. In general, a bird eats several hundred insects at a single meal, and sometimes several thousand if the insects are small. It has been calculated that in America in a two-hundred-acre field in North Carolina, birds daily destroy a million green insects or wheat aphids, insects very harmful to crops.

Some night flyers are great eaters. Dissection has revealed a single Nighthawk's stomach to contain three hundred and forty grasshoppers, fifty-two insects, three beetles, two wasps and one spider. A Swainson's Hawk may eat as many as one hundred grasshoppers for lunch. A family of Tits eats up to fourteen million insects in a single year.

Cuckoos are avid eaters of caterpillars, which they prefer to any other prey. Many of these larvae are covered with long stinging hairs which frighten off most other birds. Over three hundred caterpillars have been found in the stomach of a single Cuckoo. A Wren can eat three million butterfly eggs a year and a Redstart has been known to eat six hundred gnats in an hour.

Insects are hunted everywhere; there is no refuge where they can escape from birds. Among the cleverest birds is the Swallow which chases its winged

Honey Buzzard

victims in flight. Swallows dive with open beaks upon their prey of mosquitoes, small flies, dragonflies and tiny butterflies.

The Honey-Buzzard, which looks much like an ordinary Buzzard, feeds exclusively on insects, especially wasps and wild bees, whose nests it digs up with its strong feet. When the nest is broken up, the Honey-Buzzard neatly seizes the stinging insects one by one with its beak, slices off the poison-carrying ends, and then savours its prey as a gourmet might his shrimps.

Insects which are hunted on land and in the air try to hide in the bark or branches of trees, but even in the trunk itself they are not safe from the cunning Woodpeckers. These birds find them with their beaks which work with the efficiency and rhythm of pneumatic drills. As soon as an insect or larva is partly exposed, the bird picks it out with its long tongue, which can stretch as far as four inches from its beak. This supple tongue, coated with a slimy liquid, often has backward-pointing spines at the end so that the Woodpecker can easily extract a larva from its cover-

ing by attaching it to the end of its tongue. Woodpeckers are often blamed for making holes in trees and weakening them, and for leaving the way clear for parasitic fungi, but the benefit the tree derives from being rid of insects is far greater than the damage it suffers in the course of the operation.

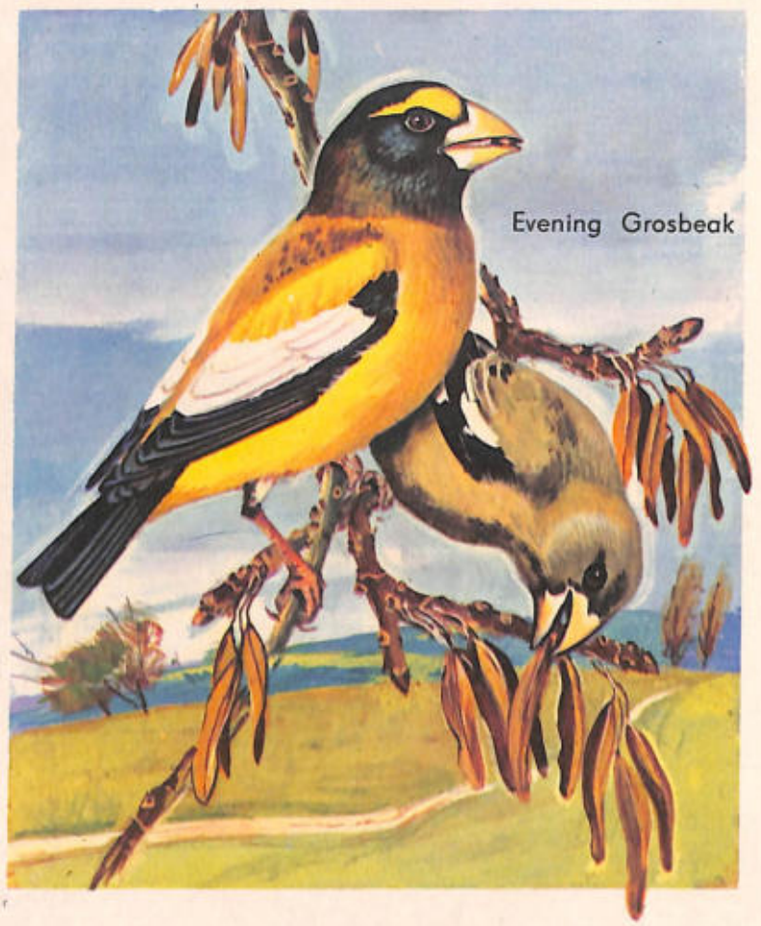
Woodpeckers also hunt on the ground, for they are very fond of ants which they skilfully capture with their tongues.

Other insects and especially their larvae are hunted on the ground by birds, among them the Hoopoe, easily recognised by its magnificent crest and black and white wings which make it look like a large butterfly. The Hoopoe's long curved beak allows it to burrow into the ground and pick out a variety of prey, including the mole-cricket, a very destructive pest.

Other birds hunt for insects among the leaves of trees. This is the difficult task of the many Warblers which in the spring attack their victims in the green branches. Flycatchers, Phoebes, Kingbirds and some birds of prey, pursue them on the wing.

Towhee

Fruit and

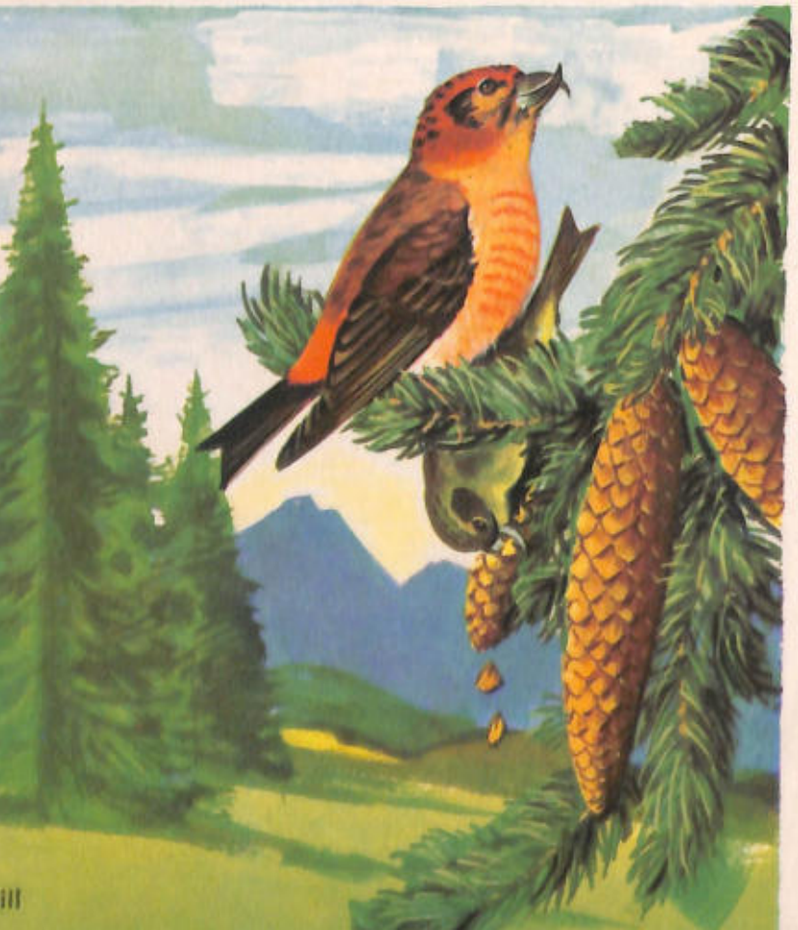


Evening Grosbeak

A FLOCK of birds has come to rest in a large fir tree, brightening the dark green leaves with red and yellow patches. Their beaks are extraordinary. Instead of ending in a point or a hook, as do those of other birds, the two mandibles of the beak are actually crossed at the tips either to the left or right. These birds are Crossbills, distant cousins of the Finches. They specialise in collecting seeds of fir trees, particularly of the Norway spruce. Their beaks are so shaped to form a perfect tool for extracting seeds hidden between the scales of fir cones.

Crossbills skillfully divide the cones, using their beaks as powerful levers. They scoop out the seeds of a cone with a spoon-like tongue, but they are wasteful feeders for they will throw away a fir cone before they have extracted all the seeds. These operations are never carried out alone, for Crossbills like company and move in great flocks over huge areas, continuing on their journeys each year as soon as the young are able to fly.

When we want to eat a nut we use a nutcracker to break the shell. Grosbeaks have an advantage over us

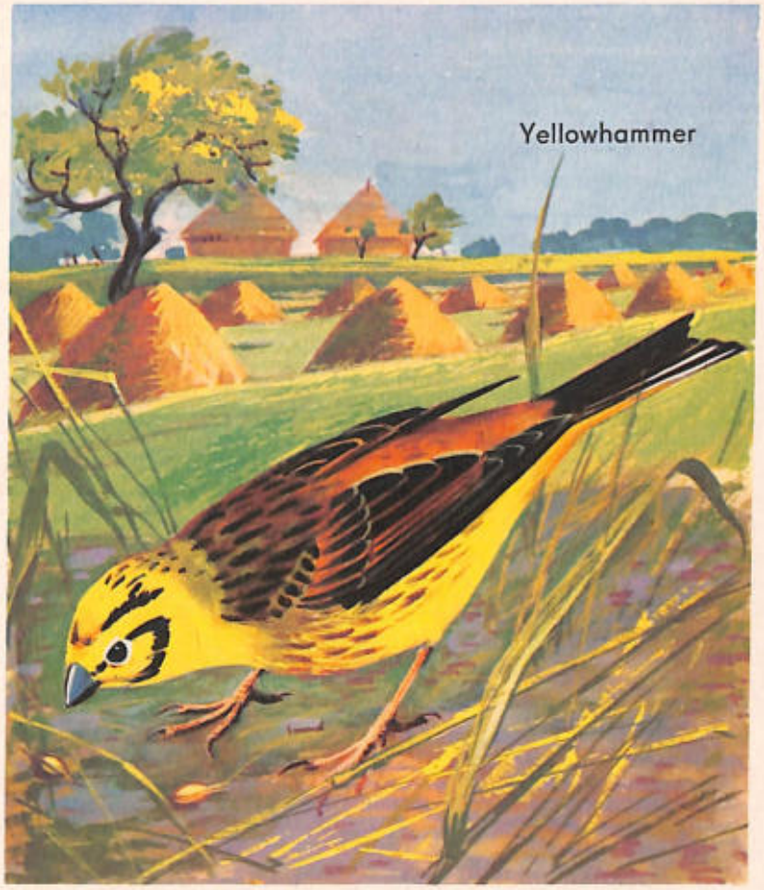


in that they have built-in nutcrackers. These sturdy birds, no bigger than Finches, have very strong beaks worked by powerful muscles. Capable of exerting a pressure of about one hundred and ten pounds, their beaks easily break the hardest fruit stones to extract the kernel. Their food, unlike that of any other bird, consists of various seeds, from blackthorn and hawthorn berries to the fruits of the maple and the ash. Even when eating cherries, Grosbeaks throw away the sweet pulp and eat only the kernel inside the stone. Their diet allows them to stay in cold climates when winter has emptied the larders of other birds.

The feeding habits of the North American Towhee reveal how varied a bird's diet can be. About the size of a small Blackbird, the Towhee scratches with its feet among the dead leaves, making a noise like a squirrel, out of all proportion to its size. An eater of wild fruit of all sorts, especially berries, it also eats ants, larvae and insects. The Towhee is very helpful to agriculture, because it prevents weeds from spreading by eating their seeds.

European Yellowhammers, with their strong coni-

Seed Eaters



cal beaks, are seed eaters too and yet, as soon as spring comes, they add insects and spiders to their vegetarian menu — though their first choice is always seeds and shoots.

Seeds are the staple diet of many birds. Even when seeds have many hard coverings, birds can crush them without difficulty. Among the biggest eaters of seeds are the North American Sparrows, so common and diversified. At first glance they all look alike with brown and grey striped feathers. But on closer observation they can be seen to be divided into many different species distinguishable by the colours of their heads, which are marked with either white, chestnut, or yellow patches. Each kind has its favourite haunt, but these Sparrows as a whole prefer open plains, fields and meadows, setting where their colouring makes them indistinguishable from their surroundings. They are considered a regular pest not only because they eat fruit bud and garden produce and drive away helpful insect-eating birds, but because they make war on the small native birds of an area.

Berries are the favourite food of many birds. Mountain ashes, hawthorns and elders are very tempting for the European Mistle Thrush, whose feathers are marked with dark speckles. The grapes of autumn seem to attract these harvesters, which otherwise eat insects, butterflies, caterpillars, not to mention slugs and snails which they cleverly extract from their shells by breaking them on a stone.

In the winter the Mistle Thrush changes its diet to mistletoe berries. Mistletoe stays green the year round. From autumn on it is covered with little white berries containing a blackish kernel. The gelatinous white substance is much appreciated by the Mistle Thrush which swallows the whole berry as we would an oyster. Swallowed with the pulp, the seed passes through the digestive system and yet retains its ability to germinate. When a Mistle Thrush excretes the seed on a branch, it sticks to the bark and starts a new mistletoe plant. As the plant feeds the bird and the bird scatters the seed, this is another example of a mutually beneficial relationship in nature.

Peregrine Falcon stooping

Birds of Prey

BIRDS of prey have a bad reputation. They are blamed for causing damage in farmyards and inflicting losses among game birds. They are also accused of cruelty. But these are hasty judgments and the case against flesh-eating birds should be revised. What is more, their numbers are decreasing at such a rate that these birds can scarcely be called harmful anywhere today.

We admire their noble appearance. Among the handsomest birds in Europe is the Peregrine Falcon, called the Duck Hawk in America. This bird may be seen on the seashore and inland, particularly in regions of high cliffs and even at times on city buildings. Easily recognized by its long, tapering wings and elegant outline, it is the biggest Falcon of its kind and also the fastest. Its favourite prey is other birds: Pigeons, Crows, Gulls, and even little Sparrows. As soon as it is within range of its victim, the Peregrine Falcon spirals up into the sky and then falls on its target in a spectacular dive. With its wings folded back along its body, it reaches a speed of 120 miles an hour in a vertical dive. It seizes the prey in its feet equipped with sharp claws and beats it to death against its sturdy breast. It never picks the prey up in its beak.

Other birds of prey hunt by lying in wait to spot their victims on the ground. The Buzzard perches on a tree or post looking out for possible victims, for the most part small rodents. They are very useful in keeping down the numbers of these harmful animals.

When night falls on the countryside, most birds retire to their roosts, both the hunters and the hunted. Owls come out of their daytime hiding places to search for food. These night birds have been hunted down by man since the earliest times as creatures of the devil, probably because of their nocturnal habits and mournful cries. Yet with few exceptions Owls are not only inoffensive creatures, but are very beautiful, with big golden eyes opening in the centre of rufflike circle of feathers. Their silky feathers feel like velvet and each has thousands of filaments, enabling the Owls to glide silently through the calm night air. Their hearing is acute and their eyesight is amazingly well developed. They even have eyelashes, an uncommon feature for birds. Their limited field

Barn Owl

of vision, smaller than that of daytime birds of prey, would be a disadvantage to Owls if these birds could not turn their heads as they can, through an angle of 270 degrees, almost a complete circle. Owls hunt small rodents, voles, and field mice, nearly all of them nocturnal animals. The Barn Owl and the Tawny Owl may eat as many as six or seven thousand small animals a year. Rodents are swallowed whole. Then the digestive juices do their work and the carnivorous bird simply casts out the hair and bones in the form of pellets. An analysis of these pellets shows exactly what an Owl has eaten.

The living places of Owls vary from prairies and marshes to dense forests. Their abundance in any locality is in proportion to their prey. They have even been known to live in the heart of large cities. Owls exist throughout the world, except in parts of Polynesia. Over 325 types have been recorded.

Osprey

Gannet diving

Fish Eaters

IMAGINE taking a ride in a boat on a river winding between two rows of trees and bushes: at every bend a different view of the countryside. Suddenly a bird bigger than a Robin, darts swiftly by. It has an azure blue back, contrasting sharply with its vivid russet belly.

If we keep very quiet it will return and perch on a branch overhanging the river to watch for fish. We may see it fly along the river, stop, flap its wings over a certain spot, then suddenly dive and catch an unwary fish swimming near the surface. Sometimes it will spear the fish on the end of its sharp, pointed beak, but more often it will seize it between its mandibles. Finding a quiet place, it will swallow its catch head first so that the fish passes more easily down its throat.

Black-Crowned Night-Heron

These elegant birds are often accused of reducing the number of game fish by killing the young ones. However, this accusation is unfair, for the Kingfisher usually eats minnows, chub and shallow-water fish which are not sought by fishermen. Their diet is supplemented by water insects, small frogs, tadpoles and some crustaceans.

In North America there is another Kingfisher, larger and less brightly coloured. This short-tailed bird is called the Belted Kingfisher.

A legend tells how the Kingfisher became so gaily coloured. Long ago, it wanted to reach the sun, and its underparts were scorched while its back absorbed the colour of the sky.

Many other fishers have settled beside fresh water. The Great Blue Herons, the biggest of all Herons, stand on long legs scouring the shallow waters step by step in search of fish. With a brisk straightening of the neck they harpoon their prey with the end of their dagger-like beaks. Their cousins, the Black-Crowned Night Herons, prefer to fish at night. They spend the day quietly hidden in thickets or reeds and at twilight emerge, making strange croaking sounds, to fish in ponds and marshes.

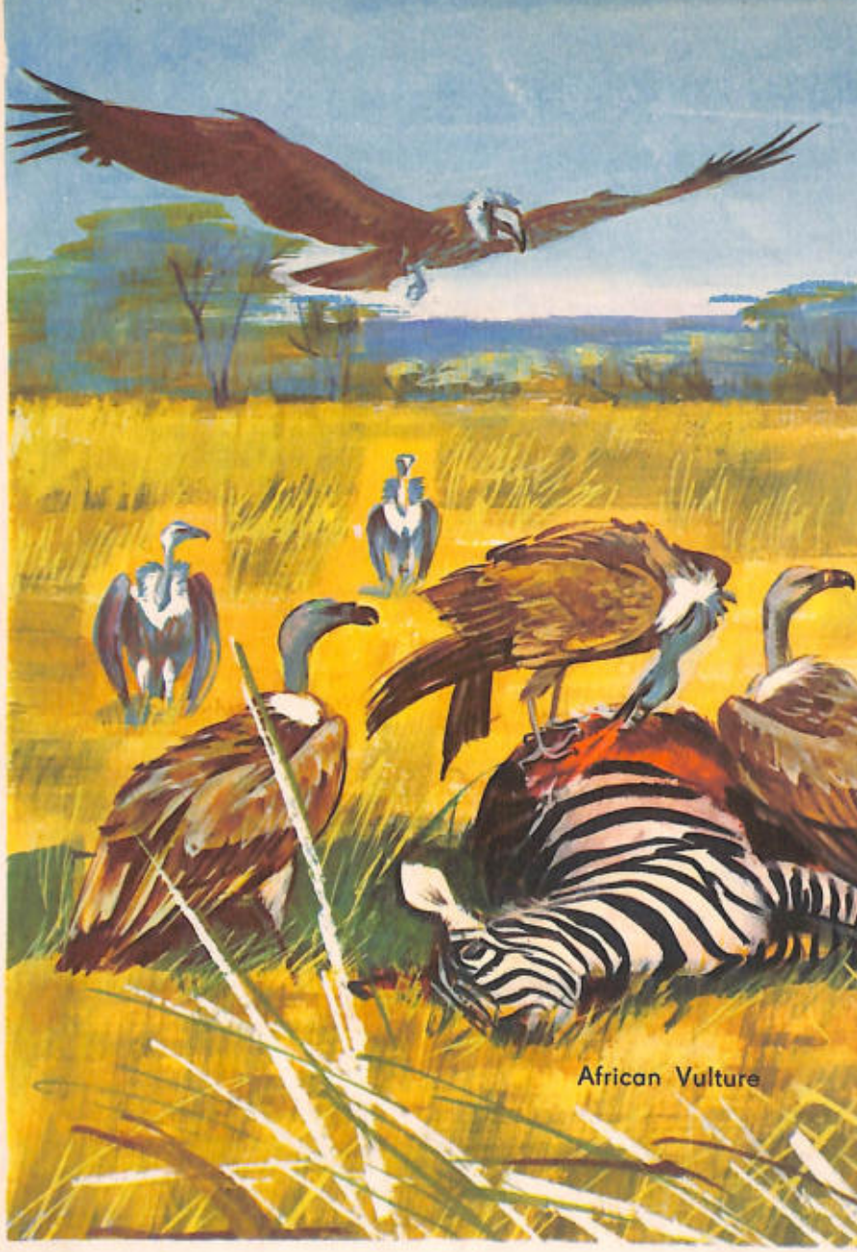
Some birds of prey specialise in fishing. The Osprey falls like a stone from the sky on to a fish swimming near the surface and seizes its prey with its sharp claws. After hitting the water with a tremendous splash, sometimes disappearing in a cloud of spray, the Osprey flies off with prey in its talons. Frequently Ospreys are themselves pursued by the bigger and more skilled Bald Eagles, which steal from them their newly caught prizes.

American Belted Kingfisher

European Kingfisher

Carrion Eaters

IN tropical Africa the savannah seems to be sleeping in the noonday sun. There is not a bird in the deep blue sky until suddenly a majestic figure veers into sight. Without flapping its wings a Vulture wheels in ever decreasing circles. A second and then a third come to join in the pattern. Soon a large group of these peculiar birds of prey is flying in slow circles. Why are they circling? Some lions must have just made a kill, which the first Vulture spotted. Its companions saw it wheeling and have come because they know that a meal is assured for them if they wait.



African Vulture

Marabou

The lions will be the first served, and they are already attending the feast. Around them prowl hyenas and jackals, which come to share the food. When the lions eventually go to sleep under the acacia trees, they leave one of their number as guard over the dismembered victim but later he, too, retires, overcome with the sleep which follows a good meal.

Now the Vultures alight, one by one. In flight, these graceful birds are most impressive. Once on the ground, however, they inspire nothing but disgust. Their strong beaks tear apart the prey which they are too weak to catch in their relatively feeble claws. Their featherless necks, their massiveness and their

Griffon Vulture

endless squabbling add to their awkward and undignified appearance.

The Vultures' ability to discover food is one of the perplexing problems in ornithology. They can find decaying meat even though the food is hidden from view and their sense of smell is not regarded as keen. It is likely that both sight and smell usually play a role in the discovery of food, with sight predominating.

Vultures play an important part in cleaning up debris. These scavengers of the tropical bush clear it of carcasses which, if left untouched, would decay and pollute the surroundings. For this reason Vultures are welcome in the tropics. They are allowed to live in villages and even near towns. There is no African village without its 'carrion eaters', and Vultures are often helped in their task by Kites and Marabou Storks. In India, Africa and tropical America, Vultures may be found wherever there is such clearing up to be done. This squalid work helps also to prevent tropical epidemics.

But we do not need to go to Africa or India to see Vultures. Several species still exist in the Pyrenees and southern France. They are found too in the south of the United States, where, as valuable scavengers, they are protected by law.

The Vulture does not have a nest but lays its one to three eggs under logs or stumps, on the ground, in caves, or similar places. The young Vultures are born naked and are fed by regurgitation.

Humming-birds

Magnificent Humming-bird

Black-Fronted Humming-bird

If there were a beauty prize for birds it would undoubtedly be awarded to the Humming-birds. These natives of the New World are nature's fire-flashing jewels. Their plumage is so brilliant that naturalists have given them the names of precious stones: Ruby-Throated Humming-bird, Amethyst-Throated Humming-bird, Fork-Tailed Emerald Humming-bird. The brilliance of their feathers is produced by each barbule which breaks up the light like a prism. The most detailed chemical analysis of their feathers shows nothing but black pigment, which means that the colour of these birds is a wonderful trick of the light.

Humming-birds are the smallest of birds, and some of them are no larger than an insect, weighing about one fourteenth of an ounce. Yet this minute bird has the same parts of the body as any other bird: a heart, a stomach and a liver which function normally.

Despite their tiny size Humming-birds are noted for their fearlessness and pugnacity. They adjust to people easily and even enter houses. If a Humming-birds is disturbed by a predatory bird such as a Crow, Hawk, or Eagle it will make an attack.

Humming-birds have a special, vibrant way of flying, which produces a buzzing sound similar to that of bumblebees. Their wings beat about fifty times a second, thus becoming invisible to our eyes. They are the only birds which can hover on the spot and can fly backwards as easily as forwards.

This unique method of flight allows them to draw from flowers the nectar which they collect as avidly as any insect. The sweet liquid held in the brilliant flowers is pumped up by their very long tongues. The sides of the tongue are curved up to make a tube, which the bird plunges into the flowers. Humming-birds complete their diet with many kinds of insects.

Their choice of food permits them to inhabit both North and South America. They are most common in the hot wet forests of the Amazon, but they also live in the high plateaux of the Andes, and the arid Mexican deserts, and one species spends the summer even as far north as the forests of Canada and Alaska. This wide variety of habitat indicates the remarkable hardiness of these birds, which is amazing considering their size.


Swallow-Tailed Humming-bird
Sickle Bill Humming-bird
Topaz Humming-bird
Racket Tail Humming-bird
Star-Throated Humming-bird
Broad-Tailed Humming-bird
Sword-Billed Humming-bird

The Honey Guide

THE African bush echoes with a curious sound, like the shaking of a half-empty matchbox. At first glance we hardly notice the bird that makes this noise. It is about the size of a Lark or a Sparrow, and is called a Honey Guide. If we approach it, the bird will repeat its strange cry, showing off its white-trimmed tail to draw our attention. Then it flies off and perches about thirty yards away, repeating its curious behaviour. If we follow it, the Honey Guide leads us through the forest until we reach a tree around which the bird flutters. If we look carefully, we will soon see what the bird was leading us to — a nest of wild bees in a tree, in an old stump, or even in the ground. The aim of the bird's repeated actions is to persuade us to break open the nest. It watches us and when we have finished and gone away it will come and treat itself to its favourite food, not the honey or the bees, but the wax of which the honeycomb is made. The Honey Guide also eats the insect grubs from the fragments of comb left behind.

This is an interesting example of cooperation between man and bird, well known to all Africans. Men seeking honey willingly follow the bird to discover the way to the hive. Once the honey has been removed the bird enjoys the wax. Digesting the wax poses a problem in physiology. No other animal is known to be able to eat this indigestible material.

Before man existed in Africa, how did the Honey Guide manage? It used various wild mammals especially the ratel, or honey badger, whose service it still employs whenever an opportunity arises. This cousin of the European badger, and about the same size, loves honey and bees' eggs, so it follows the bird to the hive. The ratel tears open the nest and licks up the sweet liquid in spite of the bees, against whose attacks it is protected by a thick hide. The bird waits patiently and then helps itself to the wax.

THE BREEDING HABITS OF BIRDS

THE spring returns and buds open, hedges are green again, a warm breeze chases frost from the valleys, and birds begin to sing.

The birds who remained at home after the migrants departed in large flocks in the autumn joined together as if to help one another. Some came close to houses and others left the snow-covered woods where food was scarce for the fields where they were the remains of grain, or for the hedges where there were still some berries and insects.

Now from the very first days of spring the habits of birds begin to change. Community life ceases to be important and birds begin to feel more independent. They shun the company of others and they chase off any birds which try to come near. Every male takes charge of a territory which he claims as his own, and he forbids other birds to enter it, sometimes becoming involved in violent fights. The male bird struts around his property. In a loud voice he proclaims his ownership of the piece of field, or hedge, or tree he has chosen.

But a bird does not wish to be entirely alone on his property so he looks for a mate as soon as possible. His song and his dress announce loudly that he is looking for a suitable mate. So that he may mate, nature provides him with a coat of far more vivid and striking colours than he will have during the rest of the year. The female, so humble in appearance compared to the dazzling male, cannot help but be impressed.

Some birds, however, are sociable the year around, including the mating season. Sea birds fall into this category and nest only in huge colonies. Perhaps the reason is that the sea offers its birds inexhaustible resources. Land birds do not find food so easily, and so are forced to spread out over the countryside and live in families apart from each other.

To win a mate, the male Black-Crowned Heron presents his chosen female with twigs, one at a time. Sometimes she not only responds to his suggestions but also starts to hunt for twigs herself and then builds a nest in which the pair can raise a brood of young. To attract a mate the male Tern catches a little fish and parades with it up and down the beach. When a female Tern comes to him and takes the fish, he bows and scrapes the sand before her, keeping alert for any signs of co-operation. If his suit is successful, he proceeds after mating to prepare a hole in the sand in which she makes the nest.

The spring is the busiest time of year for all birds for it is then that they must find a mate, lay their eggs, and, after the eggs are hatched, spend night and day feeding and bringing up the young.

Bird Song

DURING a walk in woods and fields we may be disappointed at first, for it is not easy to see birds in their natural state except when we catch a brief sight of one through the leaves or when one flashes across our path.

Luckily its song is as characteristic of a bird as is its colouring and the shape of its beak. Each of the many Warblers has a characteristic song by which it may be recognised, even when it is hidden among the leaves. Their songs vary in pitch, volume, and quality. Some Warblers have only weak, trilling songs, but some have real vocal ability. The Blackcap's song is more melodious than that of the Garden Warbler, but the Garden Warbler's is brilliant and prolonged. The Chiff-Chaff has a monotonous song of two notes which it repeats all day in an irregular order.

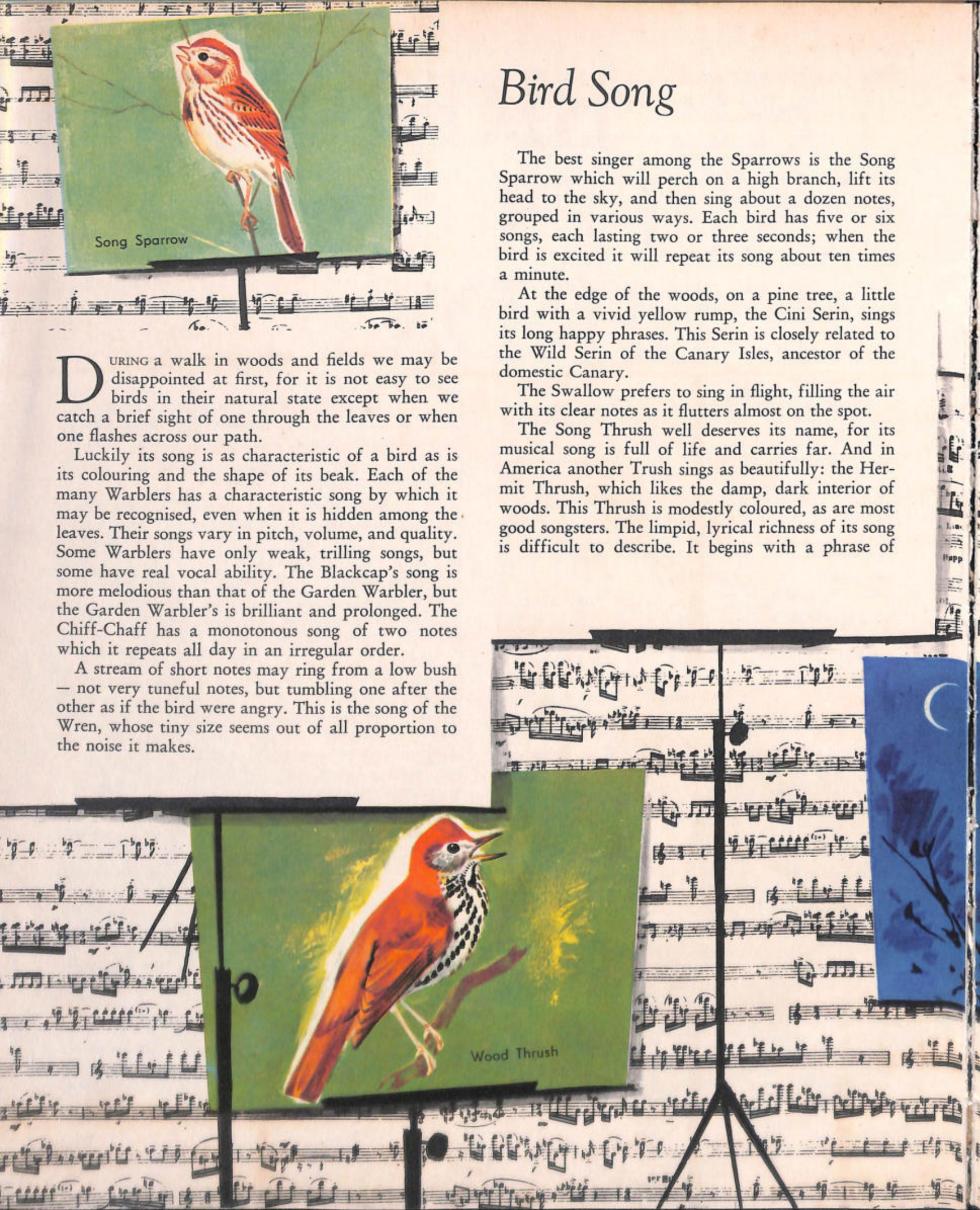
A stream of short notes may ring from a low bush — not very tuneful notes, but tumbling one after the other as if the bird were angry. This is the song of the Wren, whose tiny size seems out of all proportion to the noise it makes.

The best singer among the Sparrows is the Song Sparrow which will perch on a high branch, lift its head to the sky, and then sing about a dozen notes, grouped in various ways. Each bird has five or six songs, each lasting two or three seconds; when the bird is excited it will repeat its song about ten times a minute.

At the edge of the woods, on a pine tree, a little bird with a vivid yellow rump, the Cini Serin, sings its long happy phrases. This Serin is closely related to the Wild Serin of the Canary Isles, ancestor of the domestic Canary.

The Swallow prefers to sing in flight, filling the air with its clear notes as it flutters almost on the spot.

The Song Thrush well deserves its name, for its musical song is full of life and carries far. And in America another Trush sings as beautifully: the Hermit Thrush, which likes the damp, dark interior of woods. This Thrush is modestly coloured, as are most good songsters. The limpid, lyrical richness of its song is difficult to describe. It begins with a phrase of



linked notes rising and descending. Then the theme is repeated at an ever higher pitch, the volume changing as well as the notes.

But the most remarkable singer is the European Nightingale. The purity and unequaled variety of its song justify its reputation, although in the opinion of some people who are familiar with the songs of both birds, it is the American Hermit Trush which is the better singer.

Some birds have no characteristic tune, and imitate other birds. The most familiar of these imitators is the Mockingbird, the size of an American Robin, with light grey feathers and white spots on wings and tail which make it easy to spot when in flight. These comic creatures can reproduce almost any song they hear, including the 'Cock-a-doodle-doo' of the cock, the clucking of a hen, the barking of a dog, and the meowing of a cat. They also imitate the chirpings of their own nestlings, and they borrow even stranger noises, such as pieces of music they have happened to hear. And there is the Catbird, whose call can easily be confused with the meowing of a cat.


Skylark


Serin


Nightingale

Another bird with talent for imitation is the Starling, whose infinitely varying song reproduces many sounds of modern life. There is the story of an Englishman who, while busy cutting his lawn, was constantly bothered by the ringing of the telephone. Each time he stopped work and rushed into the house, and each time there was no one the line. Looking around he realised that it was a teasing Starling who was giving perfect imitations of a telephone bell.

We must not forget all the other, less harmonious songs – the cawing of Crows, the trumpet blast of the Heron, the quacking of Ducks, and the booming of Bitterns in the distant marshes. The call of the Bittern is like the noise made by an old pump which has run dry. All these sounds are made to attract a mate, to whom they seem as pleasant as a sweet serenade.

The elaborate variety of their songs is due to the complex muscle arrangement of birds' lungs and throats. There are so many kinds of songbirds that the order to which they belong makes up more than half of the world's bird species.

Courtnig Displays

Capercaillie (cock and hen)

WHAT would we think of a young man who called on his fiancée without bothering to dress properly? This is a mistake which birds never make, for they are at their most beautiful when courting. Their plumage is arranged to help them attract mates as quickly as possible.

We see this in the farmyard. The Turkey struts before the modestly dressed female, spreading out his tail feathers for her to admire. In the park the Peacock unfolds his fan-like tail, decorated with a thousand eyes and each feather vibrates as the Peahen approaches.

Two Ruffs in aggressive display

Not all birds are so richly dressed, but they all draw attention to some aspect of their plumage, however humble it may be. In the spring, watch the English Sparrow. The males, easily recognisable by their black bibs, strut in front of their brown mates. They dance, spreading out their tails and puffing out their black throats which they thrust forward. 'Look how handsome I am. Look at my feathers all striped with black, brown and white,' they seem to say, until the female replies, 'What a handsome partner! I would be proud to have such a finely dressed mate!'

The ceremonies of courtship are most complicated among the brilliantly dressed birds. Multicoloured Pheasants spread out their tails and ruffs and unfold their wings to display their splendour. Herons bristle up their breast feathers, which grow at the time of courtship. Egrets unfurl the long silky feathers on their backs, the feathers which were once so much sought after by women to wear in their hats.

All this takes place in the midst of a concert of song, particularly among the duller-coloured birds, which seem to make up in song for what they lack in colour.

There are other courtship customs. Terns present a small fish, held in the end of the beak, to their mates, just as a young man might offer a box of chocolates.

Among shore birds, the Ruffs form companies to do

Greater Prairie Chicken

their courting. When they arrive in Holland and Scandinavia where they bring up their young, they acquire a strange ruff of long feathers, like a shield covering their chests. The males gather in a field and unfurl their ruffs, bristling up the feathers. Getting more and more worked up, they fall on one another like knights in the jousts of the Middle Ages. These duels, in which there is neither victor nor vanquished, allow the birds to show off to the Reeves, as the females are called.

One of the most curious displays is that of the Prairie Chickens which takes place every year in the great plains of the western United States. In April the males gather in bands of up to four hundred. The ceremony begins at dawn. Each bird raises its tail like a fan of rigid, spread-out feathers. It puffs up the bright orange pouches on its chest, then, running to and fro, it throws these pouches forward, at the same time jerking its neck sharply back. This is accompanied by hollow cries which can be heard as much as two hundred yards away from the ceremony. These very special dances were noticed long ago by the American Indians who copied them and on certain occasions performed dances, every movement of which recalled exactly those of the birds.

Great Crested Grebe

Birds of Paradise

GREAT excitement stirred the Spanish Court of the sixteenth-century Emperor Charles V when the expedition of the explorer Magellan returned from its voyage around the world. Magellan himself had died in the course of the journey but the returning survivors told of many wonderful things, including fairy tale birds. These birds, the sailors reported, had no feet or wings, but instead had long tufts of silky feathers. Since the ground seemed too unworthy a place for such delicate creatures, they could have come only from heaven. So the sailors called them Birds of Paradise.

Science has since disproved these fanciful suppositions. We now know that when skinning these birds, the natives had removed the feet which they evidently considered useless.

Birds of Paradise live in the dense forests of New Guinea and North Australia. They are the most beautiful of birds. Papuan chieftains chose their feathers as the insignia of their rank. Later, as knowledge of these wonderful birds spread, their feathers were exported to decorate the heads of Indian Maharajas. Before long they reached Europe, where dandies quarrelled over them for huge sums of gold. Today the feathers are no longer used for decoration and it has become illegal to kill a Bird of Paradise.

Birds of Paradise always look magnificent, but as with all birds the males look their best when they are courting. The females are more soberly dressed.

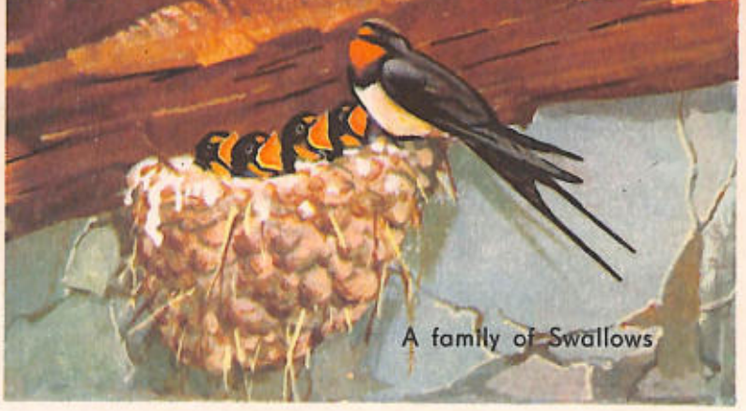
If we were to go deep into the damp forests on the mountain slopes of Papua, we might witness one of the most wonderful sights of nature. We would see Birds of Paradise gathered in groups of about twelve to a tree. They might be one of a number of kinds, the most amazing of which is the Blue Bird of Paradise. This bird has beautiful azure blue ornamental feathers. To display them, it hangs head down and swings to and fro in a graceful, circular motion. Another, the Greater Bird of Paradise, goes through a series of complicated rituals in which it lowers its head while displaying the long silky side feathers of its tail. The Sickle Bill, the biggest of all Birds of Paradise, is so elaborate that it seems to have four wings. It displays its wings by raising them while simultaneously opening its beak to show the bright yellow inside. The Superb Birds of Paradise have a huge ruff and a frill of bright green feathers, widely spread out when courting, to show off their splendour.

The rituals of their cousins, the Bowerbirds, are

even stranger. These birds live in the Australian region. They make up for the relative modesty of their feathers with extraordinary refinements in their courting technique. The males place twigs in the ground in the form of quite a large bower or stall. The ground all around is carefully cleared to form a sort of arena which they decorate with flowers, berries, feathers, and even pieces of plates and dishes stolen from neighbouring encampments. When this work is finished, the female bird perches in a nearby tree. Then the male bird begins to dance inside his construction, coming out to take up strange postures. He picks up an object in his beak as if to win his mate's admiration, then replaces it and continues his curious behaviour.

Other species of the Bowerbird build very complicated parks or bowers in which they erect one or more structures. The Golden Bowerbird builds a large hut piled up around the base of a small tree, sometimes to the height of six feet, and then builds around it a number of small hut-like structures. The whole group together looks like a miniature village, a most elaborate system with which to woo a mate.

Nests and Nesting


A family of Swallows

We have developed infinite varieties of dwellings, from the shepherd's humble cottage to the gigantic skyscraper. The site and the climate in which we are building invariably have an influence on the architecture we choose.

But with birds it is more complicated. Each little builder has to find a technique to suit its strength, the area where it is building and the materials at its disposal. Without being taught a bird will always construct its nest in a style peculiar to its own species. A bird which has never known its parents nor seen them build a nest will, when it grows up, build a nest of a kind its species has always built.

Nests are constructed and located for the protection of eggs and young, and built in secret places away from enemies. Albatrosses place their nests on remote islands; Eagles and Hawks have their nests high up on cliffs or in trees; songbirds conceal their nests on the ground or in trees. Shore birds with protectively coloured eggs simply scoop out a place on the ground. Since it is the female who generally builds the nest, it is she who is coloured to resemble the natural background.

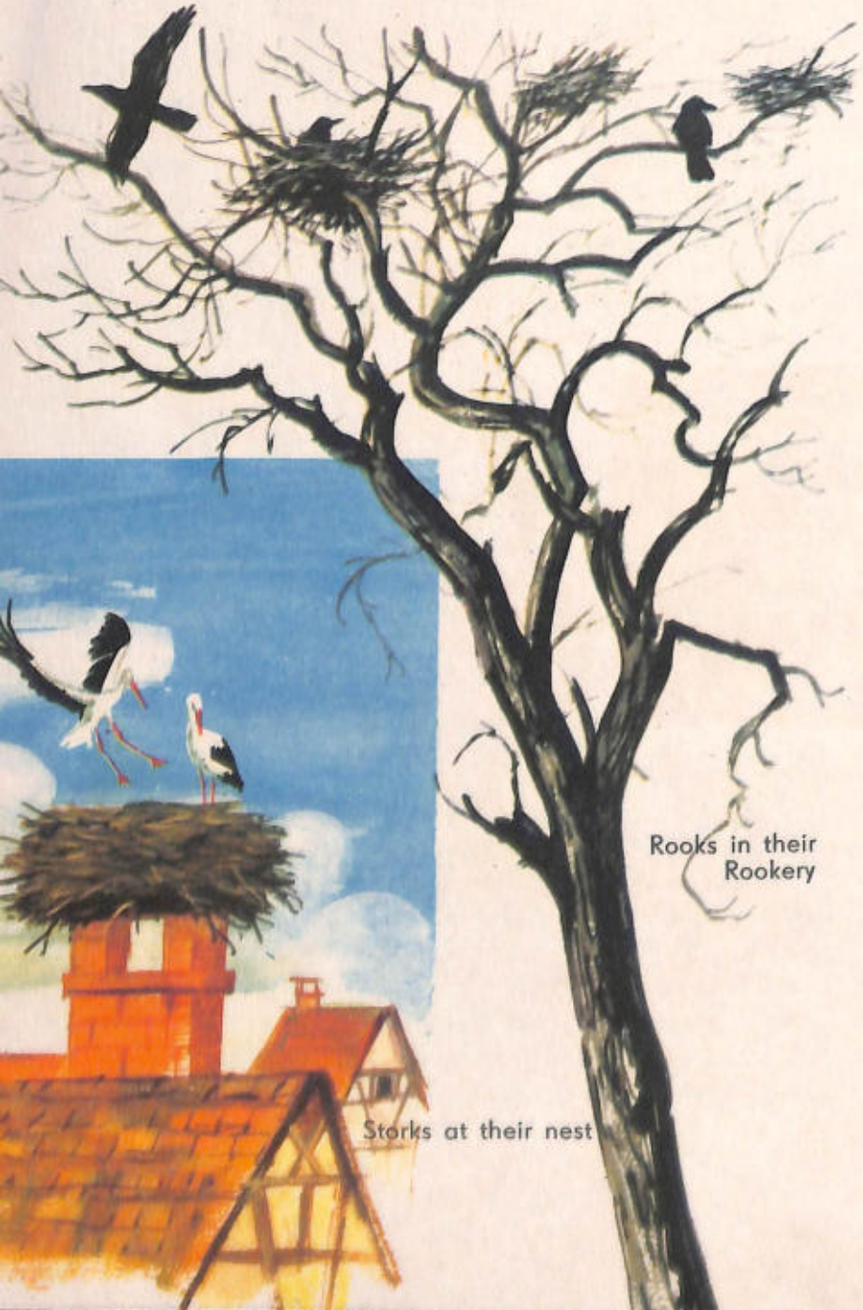
Some birds do not bother with complicated plans. Guillemots, as we have seen, do not even trouble to collect bits of seaweed, but lay their large, pear-shaped eggs on the bare rock of the narrow ledges where they nest. Plovers do not need a nest either; just a dip in the ground will do for them. Here, their protectively coloured eggs are much better hidden than if the parent birds had built a complicated nest. What use would the young birds have for a nest, since they can run as soon as they hatch from the egg?

The Lark nests on the ground, too, hiding her nest among stones which shelter it from the sun. As her young will be weak and naked on hatching, she has to build a dome of twigs to shelter her fragile brood.

In the Middle Ages barons surrounded their castles with moats filled with water, so that their enemies could not reach them. This is what the Grebe does. It builds a floating nest on the surface of ponds. First, it collects water plants and builds a platform. Then it moors this platform to some reeds. If there is a sudden rise in the water level, the platform can slide up and down on the reeds: the nest is virtually unsinkable and the precious eggs are kept safe from flooding.

Some land birds have no enemies, at least not around their nests. Who could oust Crows from their nests in the swaying branches high up in the poplars? Although storks' nests on the roofs of houses may be seen from far away, they are quite safe from attack: it is impossible for cats and rats to reach them.

Nesting is a much greater problem for other birds,


Rooks in their Rookery

Storks at their nest

American Screech Owl with young

Guillemot with its egg

Nest of the American Redstart

especially for small ones such as Sparrows, whose newly hatched young are naked and unable to stand on their feet. These babies can only open their mouths wide for constant feeding by the parents, who must leave their nests untended while they hunt all day long to satisfy their brood. A warm, soft and well-hidden nest in the branches is essential to protect the baby birds from the cold and the other enemies that would otherwise soon kill them.

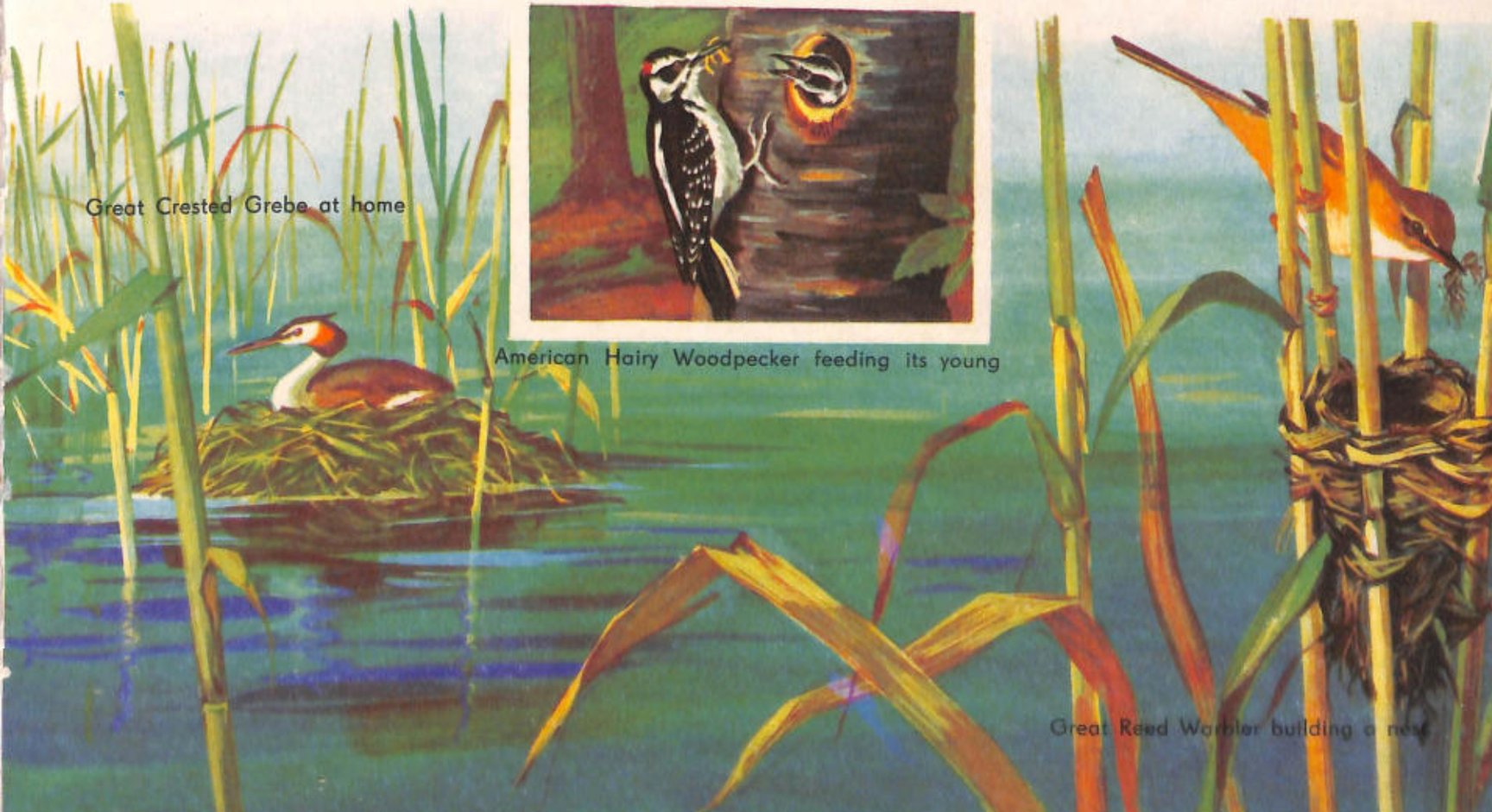
The Red-Eyed Vireo of America builds a finely plaited cup, the inside woven of the warmest and finest possible materials like grass rootlets, lichens and bits of bark bound together with spider webs. The outside is carefully covered in bits of fungus or moss to blend the nest with the branches which support it.

The Long-Billed Marsh Wren prefers to hide its nest in tall rushes. It is concealed always with the greatest ingenuity and made of plaited reeds in the shape of a ball. An opening in the side leads to an incubation chamber which is lined with fine materials and is safe against the heaviest rain. The Wren is a tireless builder: it is not content with just one nest but will build several before its mate chooses the one she will live in.

Birds are very inventive users of materials. The Swallow mixes mud in a puddle in the road, then flies quickly back to its nest with some of it in its beak. When it dries, this mud hardens and forms an attractive cup, thanks to the Swallow's skill. Before laying its eggs, the swallow lines this cup with grass and down.

Other more wary birds prefer to nest in holes. The Woodpecker busily hollows out a tree trunk, using its strong beak as a chisel. When it has made a hole big enough to hold the eggs, it lays them there on a bed of wood chips.

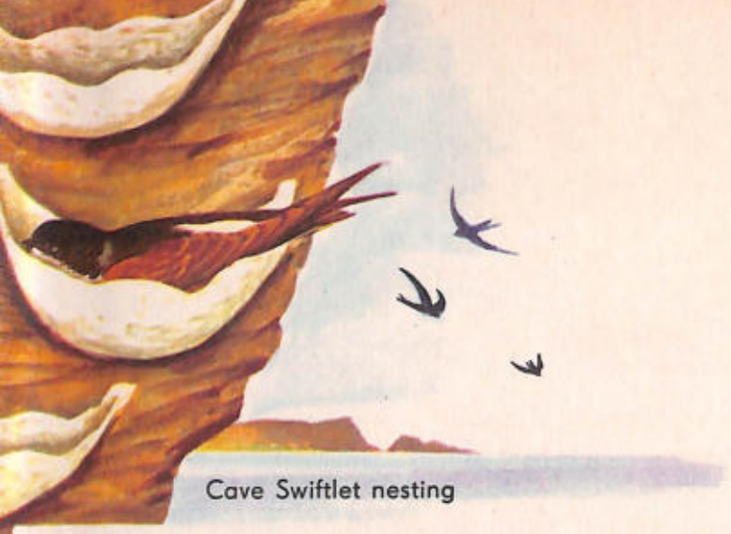
Woodpeckers are true craftsmen but some birds prefer to use already finished sites, taking advantage of another's work. Among these are Starlings, which often chase the first owners of the nest away.



Great Crested Grebe at home

American Hairy Woodpecker feeding its young

Great Reed Warbler building a nest



Cave Swiftlet nesting

Tropical Nests

THERE is a story of the Chinese Emperor Hui Tsung, who came to the throne in the twelfth century at the age of nineteen. One day he attended a meeting of the Academy of Painting where the academicians were returning works to the pupils who had submitted them to the Academy for criticism. The Emperor, wishing to honour a few of the artists whose talents he admired, invited them to dine with him in the Imperial Palace, where the artists were served a delicately scented soup in the finest of porcelain bowls.

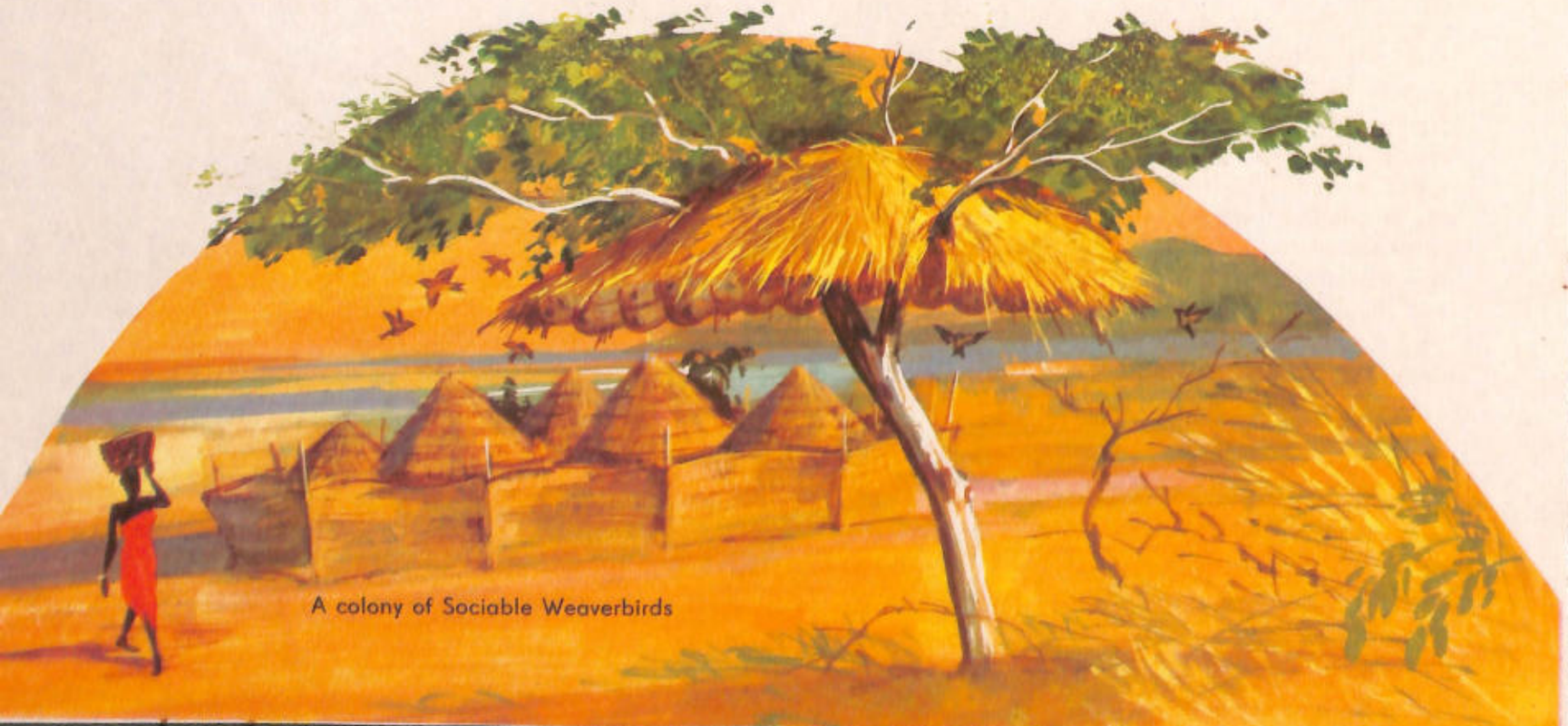
The Emperor's soup was made from birds' nests and had been for centuries the favourite food of the Court of Peking where it fetched fabulous prices. It would seem to us repulsive to eat nests, for we imagine the nests made of mud and straw. The nests so popular in China are built by the Cave Swiftlet, a close relative of the Swift, and are in fact made of a very extraordinary material.

These fast-flying birds live beside the sea and nest in caves whose mouths are washed by the waves. The nests are little white cups about two and a half to three and a quarter inches long and are made entirely of solidified saliva. Swiftlets have enormous salivary glands and secrete a mucus which solidifies as soon as it reaches the air. What could be stranger than an animal that builds a home for its young with secretions from its own body?

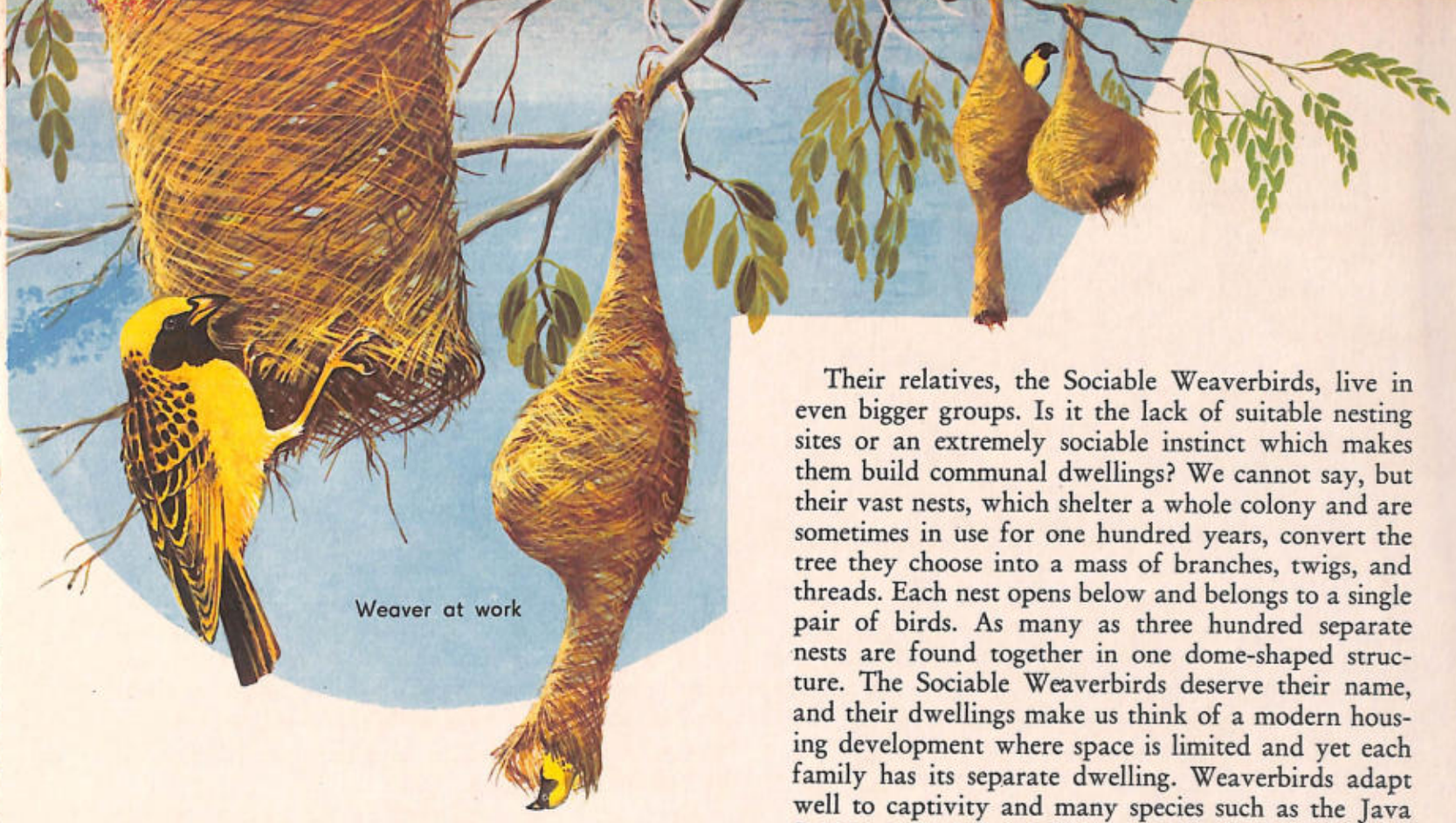
These nests were collected by the Chinese at the risk of human life, for huge, vertical rocks had to be scaled. However, the brave climber was rewarded, for the delicacy fetched large sums of money from gourmets, and the fashion still persists.

The Ovenbird of Brazil builds a spherical nest of clay. There is a hole on the side which leads into an incubation chamber. The inside of the Ovenbird's clay nest is as smooth as its outside.

The Tailorbirds of south and south-east Asia make



A colony of Sociable Weaverbirds



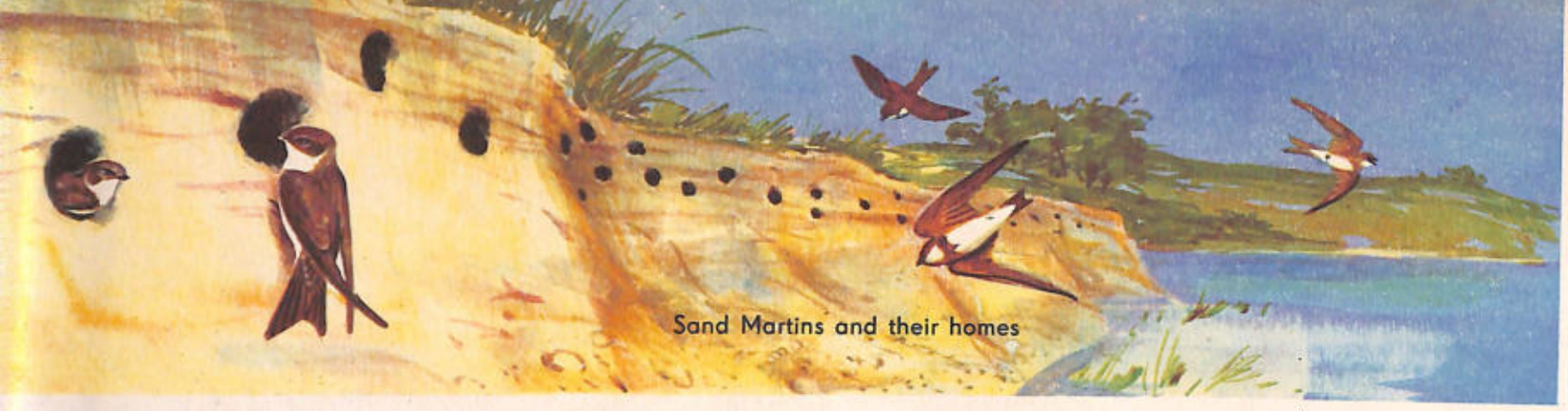
Weaver at work

Their relatives, the Sociable Weaverbirds, live in even bigger groups. Is it the lack of suitable nesting sites or an extremely sociable instinct which makes them build communal dwellings? We cannot say, but their vast nests, which shelter a whole colony and are sometimes in use for one hundred years, convert the tree they choose into a mass of branches, twigs, and threads. Each nest opens below and belongs to a single pair of birds. As many as three hundred separate nests are found together in one dome-shaped structure. The Sociable Weaverbirds deserve their name, and their dwellings make us think of a modern housing development where space is limited and yet each family has its separate dwelling. Weaverbirds adapt well to captivity and many species such as the Java Sparrow, Strawberry Finch and Waxbill are kept as cage pets.

the outside wall of their nests with leaves which they sew together as skilfully and neatly as would an expert seamstress.

Other tropical birds are also skilled craftsmen and intersperse threads in the fabric of their nests. No birds are better at this than the Weaverbirds, which are so called because of their great skill in the art of weaving. When building its nest the South African olive and yellow Weaverbird begins by collecting vegetable fibres, often those of the banana tree. Then after shredding the large leaves it takes hold of a fibre in its beak and drops with all its weight to tear free a long thread. This it carries to a spot it has chosen, a palm tree or acacia, and knots the lash skilfully around a branch, using its beak and feet. Bit by bit it weaves the threads and finally turns the construction into a fine piece of weaving, resembling the texture of a basket. The result is a good-sized nest in the shape of a bottle. A long entrance hall leads to the downy incubation chamber. The young birds are sheltered from tropical rain and are out of reach of tree snakes, their most dangerous enemies. the end of a flexible branch with the long entrance The snakes cannot enter the nest, since it swings at hall opening toward the ground. As Weaverbirds nest in groups, their chosen trees bear many nests, around which swarm masses of these yellow birds.

Tailorbird making his n



Sand Martins and their homes

Underground Nests

THE Swallows which so often visit houses and build their nests there are perfect masons, but one of their relatives is a tunneller. The best way to find it is to follow the course of a river.

The flat bank gives way to a steep one where the river makes a sharp bend. The water has undermined the ground and formed a large shifting bank of sand or clay. Here masses of Sand Martins with dark plumage on their backs, white necks and bellies, and blackish bands on their chests, are circling. To make their nests these Martins burrow in the sand of the cliffs, which soon look like a piece of Swiss cheese. The bird grips the wall with its hooked feet and begins to dig with its beak. When it has started a tunnel, its partner comes to relieve it. In a few days, unless a rock or root gets in the way, the birds will have completed a corridor about two inches in diameter and a yard or more deep. At the end of this passage they make a spacious room and fill it with twigs, wool and feathers. Here the young will be kept warm and sheltered from the rain. Nest robbers such as snakes are unable to get into this nest.

Unless the winter floods sweep away large pieces of the cliff while the birds are away in Africa, Sand Martins use the same site several times, repairing in the spring the nest which they abandoned the previous autumn.

pode hatching its eggs

How Megapodes Hatch

THE modern poultry farmer uses an artificial incubator. In this apparatus, which can be regulated at will, the eggs are assured ideal conditions of humidity and temperature, enabling the chicks to hatch more regularly than those from eggs subjected to the whims of a hen.

Nature developed the incubator long before men did. The woodlands of Australia and New Guinea are inhabited by the near relations of the domestic chicken. With long feet tipped with strong claws, these birds are the size of a barnyard cock and are called Megapodes or Mound Birds. The parents, who seem rather careless of their young, build mounds of dead leaves, moss, and humus about ten feet high and forty feet across. Deep inside this mound they bury their eggs, making use of the special kind of humidity in these artificial incubators. The heat given out by the decaying material can reach 100 °F. and is more constant that that of the most devoted of mothers. However, the parents keep watch over the mound, for the temperature must not pass a certain level. As soon as the limit is reached, the male opens the mound with his sturdy feet to cool off the inside of this strange construction. When the eggs hatch, the baby Mound Birds make their way out by carving a passage with their strong claws. They do not need the help of their parents to introduce them to life.

Hornbills

Asiatic Hornbill feeding its young

WE would think the huge-beaked Hornbill a jealous husband from the way he builds his nest. He looks for a large cavity in an old tree in the African or Asian bush. When he has found one the right size, which is not easy since many Hornbills are bigger than a large Crow, his mate gets inside it. The Hornbill then walls up the entrance with mud, leaving only a narrow slit through which the female could not possibly leave. Through this slit the male feeds his mate who is busy hatching her eggs and later caring for her offspring. The incubation chamber is completely closed except for this narrow communication with the outside world. The wall is not broken down until the brood is ready to fly.

There are all sorts of legends about this curious nesting habit. However, the real reason for such a peculiar construction is safety. Enemies, such as snakes and other flesh eaters, cannot get in through the tiny slit.

The Cuckoo and the Cowbird

BIRDS have a very well-developed family feeling as a rule, but European Cuckoos and American Cowbirds are exceptions. American Cuckoos, however, build their own nests and bring up their own young.

The European Cuckoo has lost all trace of family feeling and leaves its eggs to the care of other birds, just like the Cowbird. Usually it chooses the nests of Wrens, Reed Warblers, and Wagtails, and the female will lay one egg in each nest, taking care not to be seen. Birds will chase off the Cuckoo if they see it.

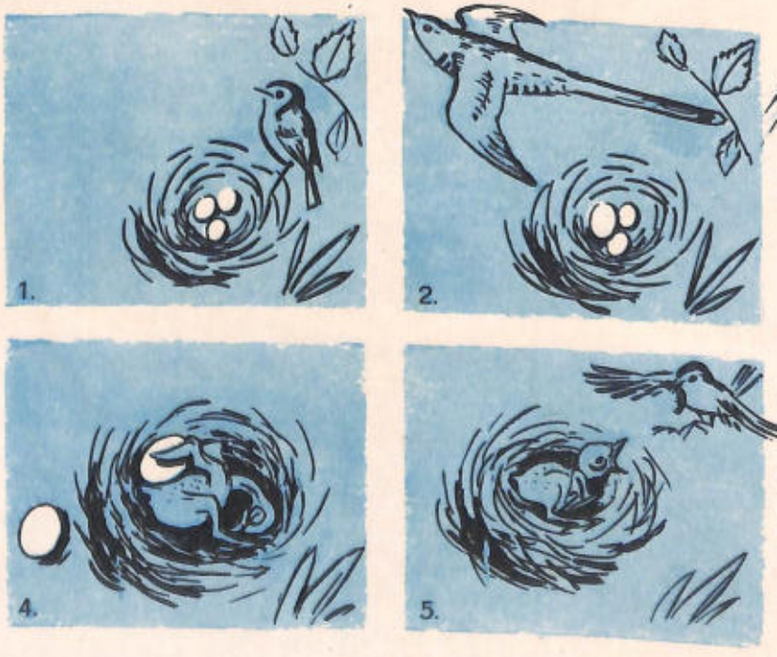
The Cuckoo's egg is very similar to those of its unsuspecting hosts, so that the trick goes unnoticed. Here again the young Cuckoo hatches twenty-four hours before the rightful heirs. Although blind and naked, it will not rest until it has thrown all the unhatched eggs of the foster parents out of the nest.

Once it is alone, it gobbles up everything that the parents bring it and grows quickly, soon becoming bigger than its feeders. The latter seem not at all surprised by this and lovingly continue to tend the chick which killed their own children. Thus every European Cuckoo is responsible for the death of a whole brood of baby birds. The Cowbird, however, often gets on quite well with its adopted brothers, as long as it well fed.

The Cowbird, distant cousin of the Grackle, probably came long ago from tropical America and spread northward across Mexico to the great plains. As the forests were cleared, the Cowbird gradually penetrated farther east and west, and now it can be seen in gardens and orchards over most of the continent.

These birds used to follow the great herds of bison and now follow domestic cattle. Cowbirds eat insects and catch those which the bison or cows disturb as they move about among the grass and shrubs. Sometimes they pass between the animals' feet and even perch on their backs without in the least annoying the large creatures which they in turn warn of approaching danger.

However, the Cowbird is a dangerous rogue and a shameless parasite of smaller birds. The mother Cowbird shows not the slightest interest in its young and forces smaller birds to bring them up. Although its relatives, the Grackles and Orioles, build very comfortable nests, the Cowbird does not gather together the smallest pile of twigs, so it is not surprising that it never settles down to family life. The female looks over the nests of small birds, particularly those of the Red-Eyed Vireos, Redstarts, Yellow Warblers, Song Sparrows, and Flycatchers. As soon as she has found a nest containing freshly laid eggs, she quickly lays her



1. A robin's nest
2. The Cuckoo lays an egg in the robin's nest and flies away
3. The young cuckoo hatches
4. It throws the other eggs from the nest
5. Alone in the nest, it demands its food
6. The mother robin feeds the young cuckoo

Young Cuckoo fed by a European Robin

3.

6.

Cuckoo egg
in a Robin's nest

own egg there, taking advantage of the momentary absence of the nest's rightful owner. She must work quickly, for if the owner discovers the trick it will most likely abandon the nest and build another.

Although the Cowbird's egg is bigger than those of the foster parents, they will sit on it as if it were one of their own. As the Cowbird's incubation period is shorter by at least one day, the young Cowbird hatches before its foster brothers and at once starts demanding food. The foster parents bring this greedy bird whatever it wants and it grows very fast. The smaller fledglings are soon pushed aside by their stronger stepbrother. Many Cowbirds have been responsible for the death of an entire brood of Sparrows. Moreover, it is strange to see the large young Cowbird still receiving beakfuls of food from its much smaller foster parents.

The Cowbird makes use of the nests of no fewer than eleven different kinds of Flycatcher, sixty-two varieties of Sparrow, nine sorts of Vireo, and thirty-six types of Warbler.

Penguins

It would seem that no animal could live in such a place as Antarctica, where icy winds sweep over the snowy wastes. But behind a cliff of ice we may suddenly discover a colony of Penguins.

There are several species of this strange kind of bird, whose wings are replaced by paddles which enable it to swim with the ease of a fish. On land Penguins look like little men and waddle about in their evening dress and fine starched shirt fronts. This human appearance is accentuated by the way Penguins are always standing about in groups and seeming to be holding conversations.

The birds were named Penguins by Spanish navigators in the seventeenth century, because of the great amount of fat beneath the skin. The name Penguin in Spanish means grease.

Although Penguins belong primarily to the Southern Hemisphere, not all of them live in Antarctica. One kind has come as far north as the Galapagos Islands on the equator off the coast of Ecuador. Others, like the Rockhopper Penguins prefer rocky islands in temperate climates. Rockhoppers are two feet high, and their heads are decorated with orange tufts.

The most impressive of all are the Emperor Penguins, which are over three feet tall and weigh up to eighty-eight pounds. These Penguins are richly dressed in feathers tightly pressed together and as warm as a fur coat. We can recognize them at once by their large size and the black and yellow markings on their heads. They live in colonies of several hundreds and even several thousands, often on ice floats in the ocean.

These birds live in the worst imaginable conditions. The temperature often falls as low as −40 °F (−40 °C) and the wind reaches a speed of sixty miles per hour, driving snow and ice before it. The Penguins crowd together into a compact mass with their backs to the wind, to protect themselves as best they can.

When the wind dies down they shake themselves free of the snow which has covered them. Then they form long lines to go fishing on the edge of the ice floe. They walk slowly and solemnly in the manner of people whose legs are too short. When surprised they lie on their bellies and slide quickly through the snow, propelling themselves with their feet and paddling with their small 'wings'. They can go as fast as ten miles per hour with this tobogganing method on the snow.

The water is their element. They swim with ease and leap out of the water like dolphins. They catch fish, squids, and crustaceans by the pound and can swallow a six-inch-long fish.

To court his future mate the Emperor Penguin offers a pebble to a female. If she picks up the pebble, she has accepted him and they mate. Unlike other birds, the Emperor Penguin lays its single egg at the

Emperor Penguins

beginning of winter, when the polar night falls on this uninhabited continent. It would be extremely difficult to build a nest where there is nothing but ice and snow, so the Emperor Penguin prefers to place its egg on its feet and then cover it with an ample fold of its lower abdomen, thus forming a pocket where the egg will be kept nice and warm. The bird still manages to walk with little steps, keeping the egg on its feet.

In August, while we are strolling on sunny beaches, the young birds hatch in the middle of the polar winter. No young bird is prettier than the Penguin chick, dressed in silvery grey except for the black and white markings on its head. At first the chicks shelter in the incubating pockets of the adults, who fight violently over them. The poor little fledglings are sometimes badly hurt through the excessive attention of the adults. Later the young birds are gathered into nursery schools just like children. There, under the supervision of a few adults, they await the return of the fishermen-Penguins who will bring them freshly caught fish. When the terrible blizzards come, Penguins encircle their young and, their backs bent against the wind, form an 'insulated wall' to protect the next Penguin generations.

The recent explorations of man in Antarctica have led to a reduction of the numbers of the colonies of Penguins. Their gregarious nesting habits and poor locomotion on land make them easy prey for man who hunts both the eggs and birds for food.

Ostriches

THE Ostrich is sometimes called the Camel Bird. Like the camel, it lives on dry and sometimes desertlike grasslands, in Africa and the Near East. It makes up for its lack of useful wings with its well-developed legs and feet. Like the camel, it has only two toes, and this makes it unique among birds. This foot construction enables it to run extremely fast on hard dry ground.

People say some very silly things about this tall and powerful bird. One completely unfounded legend is that when pursued by enemies the Ostrich hides its head in the sand, thinking that as it can no longer see, it cannot be seen.

It is true that the Ostrich will swallow any bright object witnin reach of its beak. A traveller tells that an Ostrich once swallowed a candlestick he had left lying around near the cage of one of these birds destined for the zoo. The candlestick, too big to enter the bird's digestive tract, was finally brought up whole, but fantastically twisted by the gizzard muscles. Other Ostriches have swallowed as much as eleven pounds of metal, nails, chains and even pieces of pottery and china.

The male Ostrich has magnificent white silky wing feathers. He uses these feathers to win his mate in a courting display, in which he dances.

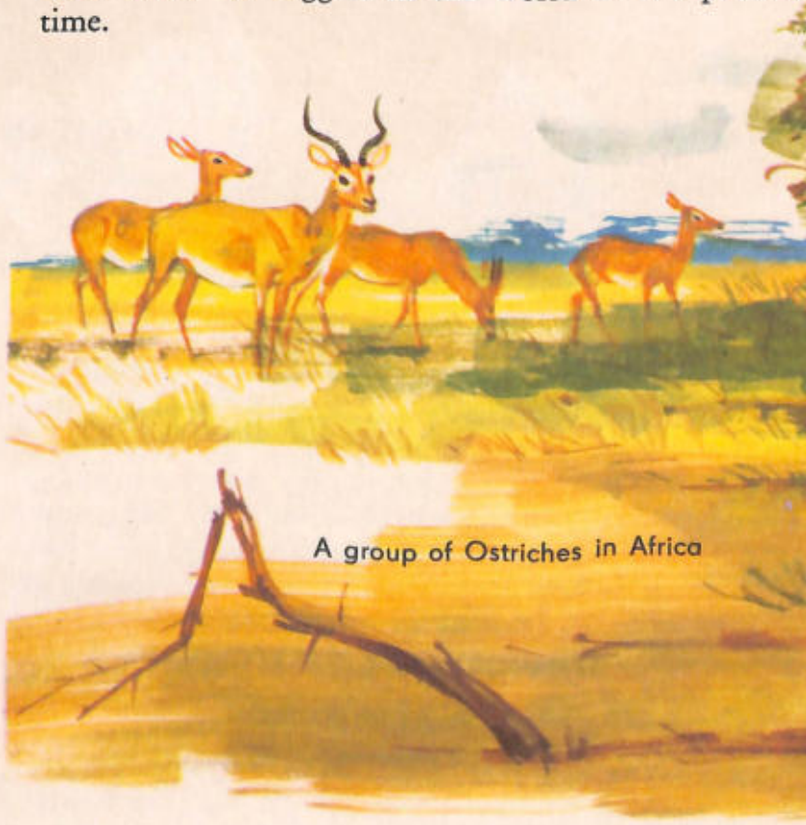
The Ostrich is monogamous when wild. His mate lays the eggs in a nest which is no more than a dip in the ground, and takes care of the hatching during the day. At a regular time each night the male relieves her, until the morning. In farms the cocks often fight and so kill one another off. This leaves unattached females who lay their eggs in the nests of mated females, so that unfertilised eggs are found there.

One Ostrich egg is the equivalent of about twenty Hens' eggs, and forty minutes are required to hard boil an Ostrich egg. A single Ostrich egg could make an eggnog which would serve about fifty people. The eggs are a tempting prey, especially for jackals.

After about six weeks the young Ostriches hatch. Each weighs about two pounds and is covered with a very special plumage which makes it look like a hedgehog perched on long legs. It is a full-time job for the father to control these busy young things who are ready to go off and hunt for seeds, berries and insects.

He must also protect his family and he does this very bravely. When a flock of running Ostriches is on the point of being caught, the male adult bird bringing up the rear tries to divert the enemy. He suddenly changes direction and falls as if injured. He gets up heavily and then falls again. This attracts the attention of the pursuers, happy that they can thus so easily capture the best bird of the flock. But as soon as the female and the young are safely away, the male Ostrich gets up and flees with huge strides, often leaving his pursuers panting and completely fooled by a bird reputed to be stupid. His speed may reach fifty miles an hour for a distance of half a mile.

By the end of their first year the Ostriches gain their adult weight of about 220 pounds, which makes these birds the biggest in the world at the present time.



A group of Ostriches in Africa

Raising the Fledglings

Some birds, such as the chicks of the domestic Hen, are covered in down on hatching. They can walk a few hours after birth, so they leave the nest very early and follow their parents who at once begin to teach them. At the slightest danger, they answer their mother's call and hide under her wings. Thye also spend the night in this downy shelter or wait for the rain to stop.

For some parent birds, however, the hardest work of the year begins when the nestlings are hatched. Their hungry offspring demand food from morning to night, so the parents have to hunt incessantly and are forever coming and going to feed their nestlings with insects and small worms. Tits return to the nest nearly four hundred times a day with mouthfuls of food for their large family of as many as six to eight birds. They have been seen coming to the nest eighty times in an hour.

Young birds of prey are unable to leave the nest until a later stage than most other birds. The parents bring food which they have caught for them. Their mother dismembers the prey and feeds it to them bit by bit and they swallow it greedily.

Some birds, Pigeons, for example, are naked and weak when they hatch. They cannot leave their nest and the parents must continue sitting on the nest to keep them warm. For the first few days of their lives, young Pigeons feed on a milky substance secreted in the parents' crop.

After a certain time, about two or three weeks with small birds, the young are ready to fly. They seem very afraid to leave the nest or to jump into the air in spite of the encouragement of their parents. When they do learn to fly, the family still stays together, even if only to allow the parents to continue to feed the young birds, neatly lined up on a branch. Bit by bit the fledglings gain confidence. Soon they are as experienced as their parents. They go off on their own, often leaving the place where they were born.

A new generation of birds is ready to enchant our woods and valleys.

Mallard duck and ducklings

MIGRATION

For many people an ideal life would be to spend spring in town, summer by the sea or in the mountains, and winter in a warm country. Many of our birds have made this dream a reality. Every year migrants undertake very long journeys; many of our summer visitors could not live if they did not travel. What food could Swifts and Swallows find in the cold winter air, and Warblers in the leafless trees? The insects by then have disappeared, their nymphs and larvae buried deep in their hiding places in tree trunks or the ground. In the Far North how could ducks and shore birds live on frozen lakes hidden under a thick coat of snow? Frogs are hibernating and mollusks are deeply buried in the mud. The birds which lived at their expense in the summer have no alternative but to go to a warmer country. They go to avoid hunger.

We have only recently discovered where migrants go. For a long time is was assumed that birds went to sleep in the autumn like cold-blooded animals. It was thought that Swallows gathered among the rushes and plunged into the water, where they spent the winter. This belief was still held by the famous scholar Linnaeus at the end of the eighteenth century. Whimsical writers imagined that birds left our countries to spend the winter on the moon.

Fanciful theories have been replaced by a deeper knowledge of bird migrations. We now know where migratory birds spend the winter, and how they travel, but there remain many mysteries to be solved. The most exciting concerns the birds' sense of direction, an extremely important phenomenon which is still only partly explained. We sometimes get lost in the town where we live, or wander off course on a walk in the country, but the little Swallow, which leaves the roof-tops of Europe and North America in autumn and goes to Africa, or the Amazon basin or the Argentine, is able to find its nesting place again the following spring without making a mistake, having travelled as much as six thousand miles.

Birds leave colder areas and fly south to find food in winter, then again fly north in summer to escape competition. Some birds migrate by day, but most migrate by night. The migrations north and south are the best known. Some birds move only a few hundred miles from their breeding to their winter range while others cover several thousand miles. The champion migrating bird is probably the Plover, who travels nonstop the 2,400 miles between Alaska and Hawaii.

Ringing Birds

At the beginning of this century a young Dane, intrigued by the journeys of the Storks which nested near his house, attached a medallion bearing his name and address to the leg of one of these wading birds. The following year the Stork returned bearing a little object from Benares, the holy city in India. This exchange of messages continued the next year and resulted in the marriage of the young Dane and the daughter of an English settler of Benares, who had met through this migratory bird.

The happy ending is probably made up, but this story illustrates many of the experiments which have been going on for a long time in the study of the movements of birds. Pliny, the Roman naturalist, reported that in the first century A. D. a Roman who was enthusiastic about chariot racing brought Swallows with him to the races where he freed them, having dyed their feathers the colour of the winning team. This was to inform his friends in the country of the winners.

It was not until the beginning of the twentieth century that ornithologists began to use truly scientific methods. Now a ring is fixed around the leg of the migrant in the form of an aluminium bracelet bearing the abbreviated address of the institution in charge of these operations, and a number. This ring is the bird's identity card. It helps you to find the name of the bird by referring to the ringing card index, as well as to find the place where it was ringed and the date. When the bird is found, either killed by a hunter or by accident, or captured by a bird-watch-

Wild Geese flying in V-formation

ing station, its route can then be carefully estimated.

Thanks to these rings, a Guatemalan hunting in a forest is able to tell that the Duck he has just killed was migrating from the marshes of Saskatchewan or Dakota where it was hatched, to spend the winter beside the great rivers of South America. An Arctic Tern ringed in New Brunswick, Canada, was identified by its ring while spending the winter at the Cape in South Africa, and another ringed at the same time was found at La Rochelle in France.

How are birds ringed? First you must obtain the necessary permission to make a suitable trap in your garden. Then you must catch the birds you want to mark and even more important have the specialised knowledge to recognise them perfectly, for it is essential to note exactly the kind of bird you are to ring. The person who finds them may not be an ornithologist, but more probably a hunter, a fisherman or a farmer.

To catch as many birds as possible, bird-watching stations have been set up on the most important migratory routes on which large numbers of birds travel. Usually the number of ringed birds recovered is very small. Ducks are most frequently found because they are hunted, but no more than twenty per cent of wild fowl ringed are recovered. Among little birds the proportion is even smaller. Of 16,203 Warblers ringed at a single time, only fifteen were recaptured. So tens of thousands of birds must be ringed to plot the migratory routes of the commonest birds.

Every year bird-watching stations ring a large number of migrants. More birds are ringed in Canada and the United States than anywhere else; about six hundred thousand are ringed there each year. Of these birds about seven to eight per cent are usually recovered.

The small proportion of recoveries makes it the duty of each one of us to send back rings we may discover as soon as possible, as well as all the information about how and where we found them. Do not follow the example of the fisherman who kept rings as souvenirs in his tobacco pouch, or some African natives who keep them as beads on a necklace. We can all become helpers in a research project which exists for the better protection of birds and which has laboratories covering the whole world.

Where Do European Birds Winter?

THE Swallows of Europe gather in flocks on telegraph wires. They wheel in the September sky and disappear, bound for Africa where they spend the winter.

These fast-flying birds meet great dangers, but they are well-suited to such long flights. If they linger in Europe, the Swallows risk being surprised by a sudden cold spell which will kill off their favourite insects and leave them starving. So they set off knowing they must cross the Mediterranean before the storms which are frequent in spring and autumn. After a pause in the greener parts of North Africa, they are confronted with the next obstacle, the Sahara Desert. They rest now and then at an occasional oasis, but vast stretches of sand must be crossed, with not a tree or bush to shelter them from the intense cold of the night and the burning heat of the day. When the greener Sudan is reached, their trials are nearly over, although many Swallows are lost in tropical tornadoes. But they are not satisfied with these very pleasant regions and press on as far as the Cape, as much as 6,200 miles from their native land. What a traveller's tale could be told by the bird that comes back to nest under an English roof in the spring! It could tell of endless desert and luxuriant virgin forest. Before the Swallow returns to perch on the telephone wire, it will have perched on palm trees, on thatched roofs of African straw huts, and on baobab trees, the giants of the equatorial forests, with bulging trunks shaped like bottles.

In the spring it is easy to tell when the migrants have returned, for each bird announces its arrival with loud cries. On the other hand, their departure is much quieter. Birds are silent once their young have grown up. But, although they are quiet, their departure is still spectacular, for many assemble beforehand in flocks of thousands.

In Europe the Cuckoo is the first to leave. A solitary bird, it goes not in a group but alone. After July its two-syllabled cry can no longer be heard in the woods. It has already left for tropical Africa.

On an August morning the sky is suddenly emptied of Swifts. For some days they have been making less noise and preparing for their journey. They, too, seek the sun of tropical Africa for the winter.

The Golden Oriole leaves at the same time, going the roundabout way. It lingers by the Mediterranean when the figs are ripe and then continues to Africa.

Storks gather on the damp plains of Germany during the last days of August. The solemn flocks are inspected by one of their number and then spiral up into the sky to disappear over the horizon, Africa bound. They have an inherited sense of direction. If a young Stork is blown off course or becomes lost from the rest of the flock, it will eventually find the way to Africa, a land where it has never been.

In September and October the small birds hurry in countless flocks along the migratory routes, often flying only at night. If you go on to the platform of a lighthouse after dark, you may find flying in the beams of light thousands of Warblers, Flycatchers, Thrushes, and many birds too far off to be recognized, looking like tiny points of light.

In October squadrons of Cranes flying in V-formation make the air ring with their discordant cries. This is also the best time to observe huge gatherings of migrating shore birds. Thousands of Sandpipers, Plovers, and Curlews are gathered together in preparation for their journey south. Some will go as far as Africa. Others will stay along the European shores of the Mediterranean.

The European Starling is proof of one theory of migration, substantiated also for a number of other species. This is that birds find their way by a form of sun navigation. These Starlings are known to orient themselves by the position of the sun, and when the sun is obscured are unable to find their way; they can even be fooled by the reflection of the sun from mirrors.

In some parts of Europe Crows and Carrion Crows migrate. And so do some of the Buzzards and Ospreys, and other birds of prey.

Not all European birds migrate. Some birds stay behind. While the open country is left to the Crows, others, such as the Tits, Robins, and friendly Wrens, come closer to houses.

MIGRATION OF
THE EUROPEAN STORK

The dark green zones indicate
the nesting areas

The dotted lines show
the migration routes

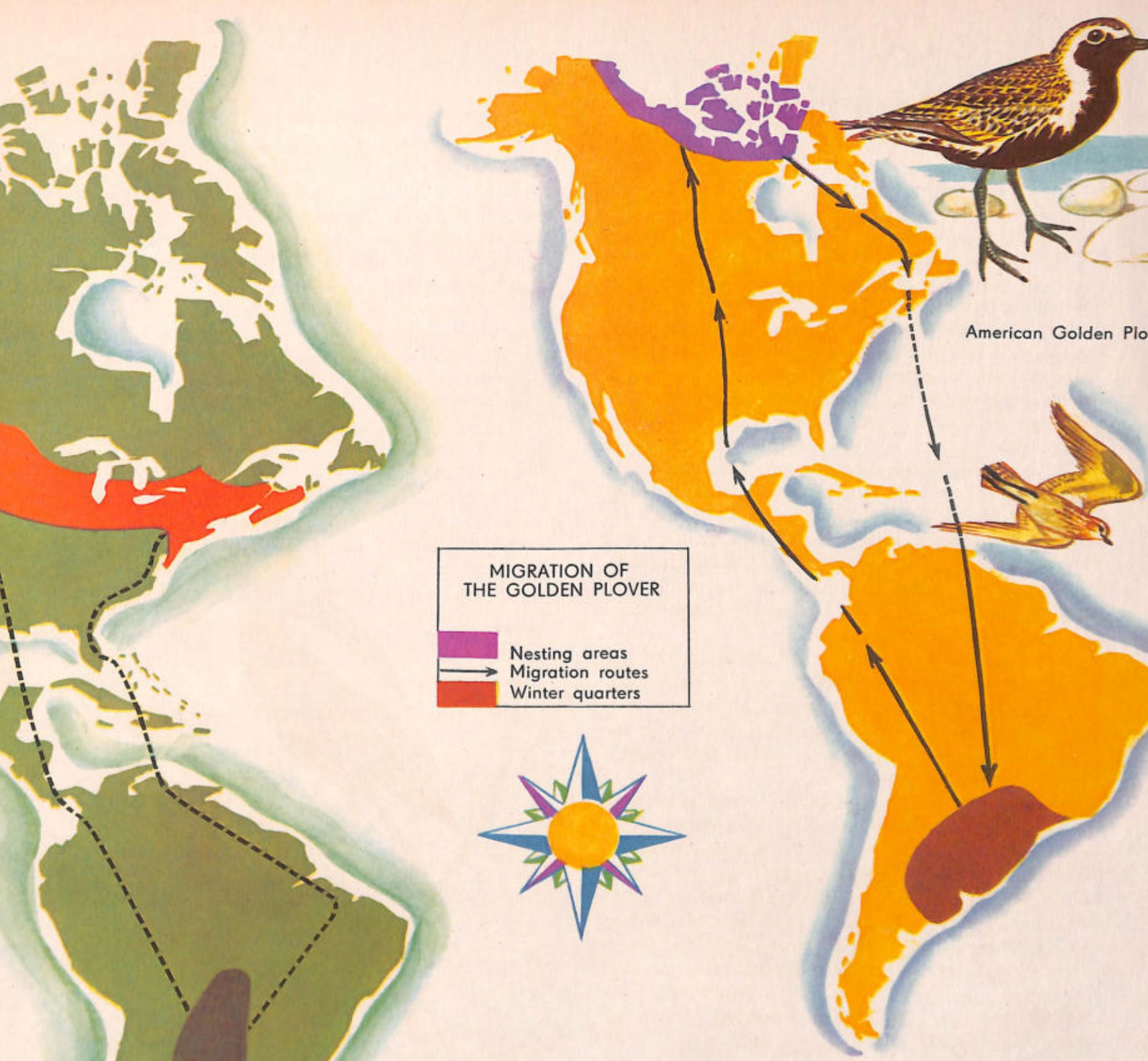
Where Do North American Birds Go?

THE end of August is the time for the Bobolink to start its yearly journey. It has stopped singing its characteristic song, which is one of the most beautiful sounds in North America with its joyfully vibrant metallic notes. The young birds, sheltered in the summer in nests hidden on the ground among the long grasses, are now grown and are ready to desert their native land, which will soon become inhospitable.

The Bobolinks leave their summer quarters and go southward. After lingering in the Gulf states, they cross the Gulf of Mexico, calling at Cuba and Jamaica, and arrive at last in Northern Columbia and Venezuela. Bobolinks seem to be particularly fearless, for few North American birds have the courage to cross the sea and prefer to follow the longer route over Central America.

Even when they arrive in South America, the Bobolinks have still not reached the end of their journey. They have to cross the forests of the Amazon and then the endless pampas before they come to the marshes of Argentina, which is where these tireless migrants spend the winter.

The Bobolink is only one of the many migratory birds. Some of the less demanding birds converge on parts of the United States that remain warm during the winter. To reach these states, millions of migrants follow the Atlantic coast, passing along the dunes and collecting along the way in privileged places such as Cape May in New Jersey and Cape Charles in Virginia, where thousands of bird watchers come each year to see them pass. Others come down the Mississippi Valley, one of the most important flyways of North America. This great route, interspersed with marshes and resting places, is followed from Alaska and the Northwest Territories of Canada by Ducks and Geese, which spend the winter not far from the Gulf of Mexico. When hastened by the cold, millions of Ducks pass over the central part of the United States in a few days. After having flown at a speed of fifty miles an hour and at heights of fifteen hundred to three thousand feet, half a million Ducks have been known to arrive in Louisiana in a single October. Thousands of rings which had been placed on these birds in their summer quarters or as they had passed various points in the Mississippi Valley showed



that some of them nested in the Dakotas, in Canada, and even in Alaska.

Other migrants prefer to take refuge in the warm regions of the western United States, especially in California where the climate is mild the year round. Still others gather in Central America for the winter. If we went for a walk in the forests of Panama, San Salvador, or Guatemala, we would see many North American Warblers, Flycatchers, and Tanagers. The native birds find themselves up against strong competition for space and fight bitterly to resist these seasonal invasions.

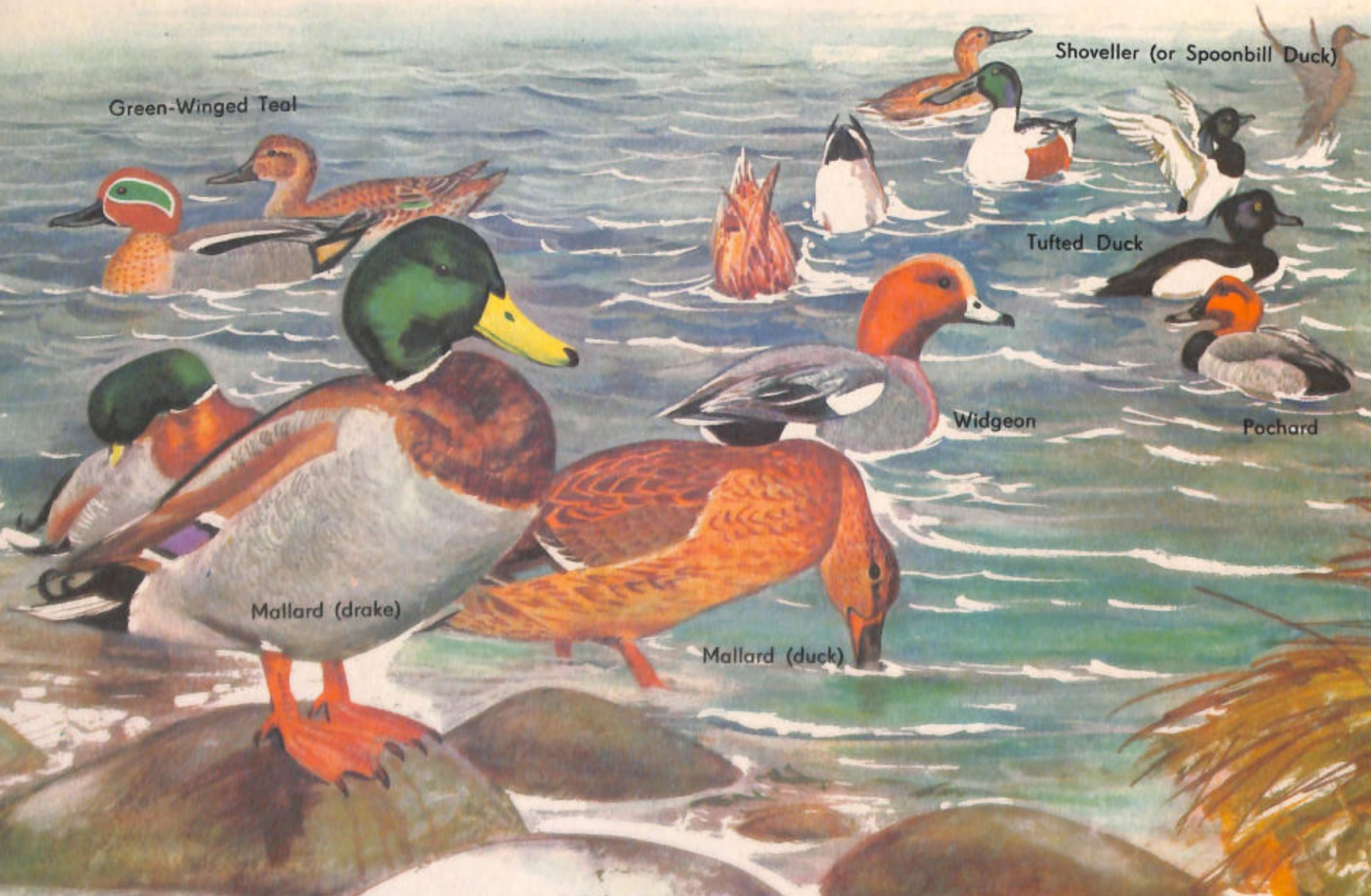
Geese, Swans and Ducks

WINTER scatters the birds. From Europe many flee to tropical Africa. On the other hand, enormous flocks of Ducks and other web-footed birds arrive in middle and southern Europe from the north. Winter has frozen the lakes of their homeland, making it impossible for them to satisfy their voracious appetites. Many of those that settle for the season on the lakes, marshes and great estuaries of France come from Scandinavia and Siberia, Greenland and Iceland. The beaches of Brittany, deserted by swimmers, are full of Brent Geese; the sheltered coves have become the home of Widgeons, with their cream-banded red heads, and whose soft but resonant whistling pierces the heavy fog and betrays their presence long before they can be spotted.

Tufted Ducks, Goldeneyes and Pochards are winter visitors too, from farther north. There are also the Pintail Ducks, with their long white-striped necks — and many more.

As the winter becomes more and more severe and great waves of cold sweep down from the north, fresh flocks of birds arrive, flying in V-formation, as if to tear more rapidly through the air. The Geese and Swans of the far north follow the Ducks on their seasonal travels. In Europe those which spend most of the winter in the Netherlands or Germany come as far as France in the middle of the season.

Canada Geese descend in flocks to the southern states of America for the winter, flying too, in the V-formation. The older male birds lead the squadrons calling the familiar 'honk, honk'. They are answered by their followers. To reach a safe resting place where they can land in peace, Canada Geese fly night and day without stopping. They are the wariest and most intelligent of all web-footed birds.




American Canvasback
Pintail
Goldeneye
Shelduck
Barnacle Goose
Brent Goose
Whooper Swan

Birds Which Cross Oceans

OCEAN birds migrate like land birds, and coastal birds — the Geese, Swans and Ducks. Winter chases them to warmer seas, and some of them make exceedingly long journeys right across oceans. A few land birds fly across oceans too. Some Penguins, who cannot fly, migrate by swimming and spend the southern winter on the high seas. There are also good fliers who migrate by swimming.

The most astonishing of the ocean-crossing birds is the Arctic Tern, which migrates from far north to near and at times beyond the Antarctic Circle, flying about 10,000 miles in a definite direction. The autumn migration begins about July, and goes on into October, and birds returning in the Spring begin to arrive in Europe in April. They winter out at sea or near the shore. The Arctic Tern flies alone or in groups of up to about twenty and with its slight weight and large wings, does not look well adapted for the extraordinarily long journey it makes.

Shearwaters are also good travellers and the Short-Tailed Shearwater, common in Australia, flies in a great loop over the Pacific. As it is found both north and south of the ocean it was once thought there were two groups, but ringing proved that the birds migrate, easily flying the tremendous distance. The Sooty Shearwater crosses the Atlantic.

Another bird which migrates over the Atlantic is Wilson's Petrel, while the Giant Petrel migrates when it is young but later settles down by the breeding colony.

Several groups of Kittiwakes and Skuas migrate over the oceans. Of the Kittiwakes some go south; others go from east to west, moving over the North Atlantic to Iceland, Greenland and North America. The migrations of Skuas were for long a mystery as they winter on the high seas after nesting of northern coasts, except for the Great Skua, which is more solitary and nomadic than migratory.

Birds which cross oceans use the winds but they do not depend on them. Petrels and Albatrosses especially glide easily over great distances using the prevailing winds and come to land only to nest.

MIGRATION OF THE ARCTIC TERN

The Return

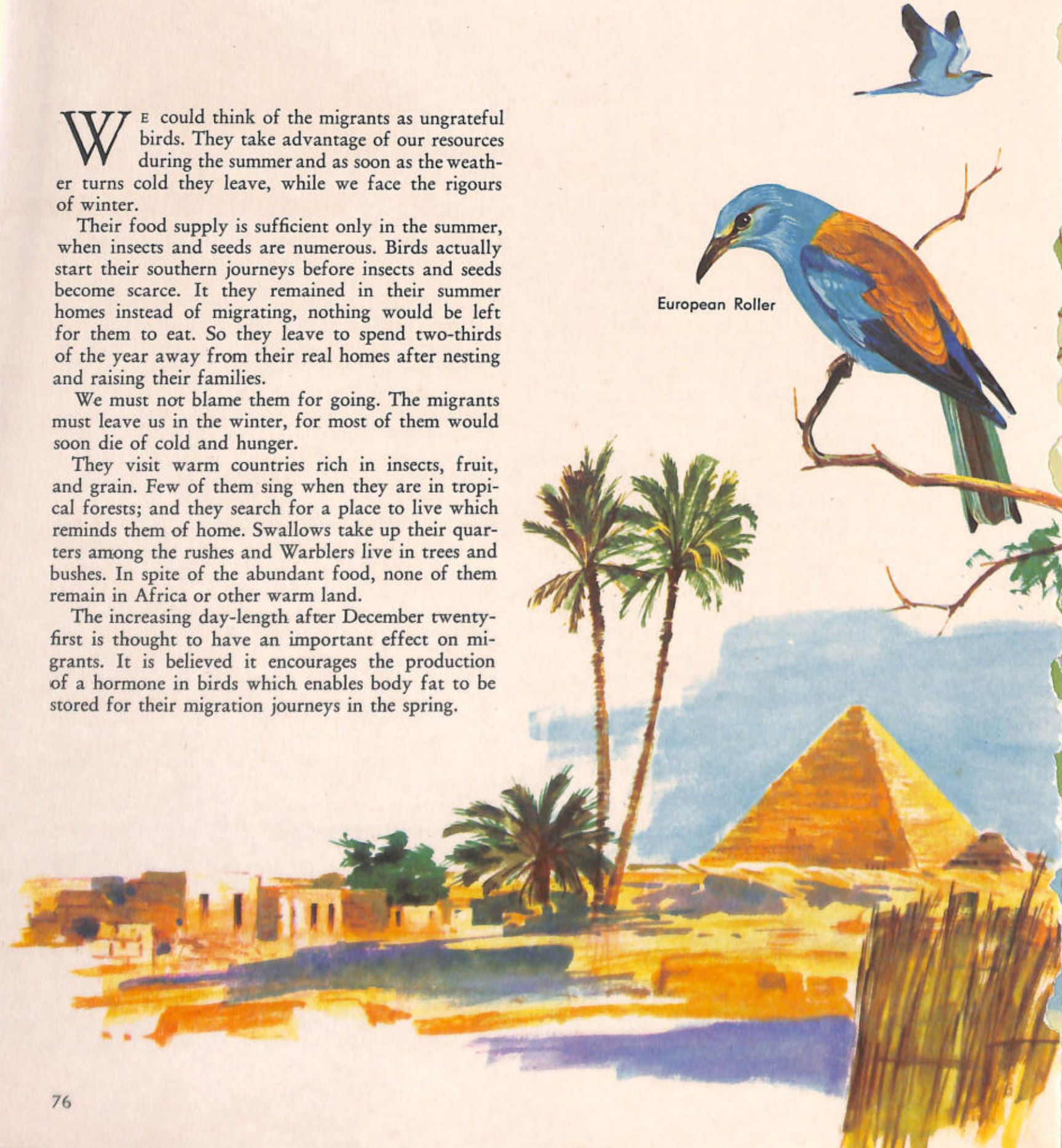
We could think of the migrants as ungrateful birds. They take advantage of our resources during the summer and as soon as the weather turns cold they leave, while we face the rigours of winter.

Their food supply is sufficient only in the summer, when insects and seeds are numerous. Birds actually start their southern journeys before insects and seeds become scarce. It they remained in their summer homes instead of migrating, nothing would be left for them to eat. So they leave to spend two-thirds of the year away from their real homes after nesting and raising their families.

We must not blame them for going. The migrants must leave us in the winter, for most of them would soon die of cold and hunger.

They visit warm countries rich in insects, fruit, and grain. Few of them sing when they are in tropical forests; and they search for a place to live which reminds them of home. Swallows take up their quarters among the rushes and Warblers live in trees and bushes. In spite of the abundant food, none of them remain in Africa or other warm land.

The increasing day-length after December twenty-first is thought to have an important effect on migrants. It is believed it encourages the production of a hormone in birds which enables body fat to be stored for their migration journeys in the spring.



European Roller

BIRDS & MAN

WHENEVER a Stone-Age man left his cave, a marvellous sight met his eyes. In the swampy plains all kinds of birds were to be found. Thousands of wild fowl were roaming about with countless little waders. Farther off in the dense forests there were quantities of gallinaceous game birds, which showed little fear at the approach of man. In autumn millions of migrants came from the north and their flocks darkened the sky as they passed.

Since those far-off times, the human population has increased considerably and the earth has been transformed. The marshes have been drained and the forests cut down to provide new fields. As a result of these changes, many of the big woodland birds are gradually disappearing.

We still may see multitudes of birds on our walks, but their numbers are few compared to those a naturalist would have seen only a few hundred years ago. For example, when the first settlers reached North America in the sixteenth century there were 500 million Ducks on the continent. Today there are only about 50 million.

However, many birds multiply at a great rate. A Thrush raises two broods of four birds every year. This bird can live for about ten years, so if none of its descendants died and all multiplied at the same rate, the total number of Thrushes descended from the original pair would well exceed 19 million after ten years. Humming-birds and Nighthawks have two chicks, other small birds four or five, Wrens eight or ten, and some Ducks and Rails as many as fifteen. This overproduction always happens, as there must be a sufficient supply of youngsters growing up to offset the accidents that are destined to occur. Each bird has its own special enemies as well as a special set of dangers that it may encounter.

But no bird has so many descendants. This is because young birds have a high death rate. Only forty per cent of the eggs laid produce young which live to leave the nest. In their first year of life many more die, so that apart from occasional exceptions, from year to year, the bird population does not increase.

Added to losses by natural causes are those for which man is responsible. In the last century the hunter was the big threat to birds. The hunting of birds is a much more widespread activity than most people realize, and game laws were for a long time not very good. Feather huting and the collecting of nests and eggs have also been responsible for the destruction of billions of birds. Hunters kill so many Pheasants that the amount of Pheasant meat consumed in a single year is equal to that of fifty thousand cattle.

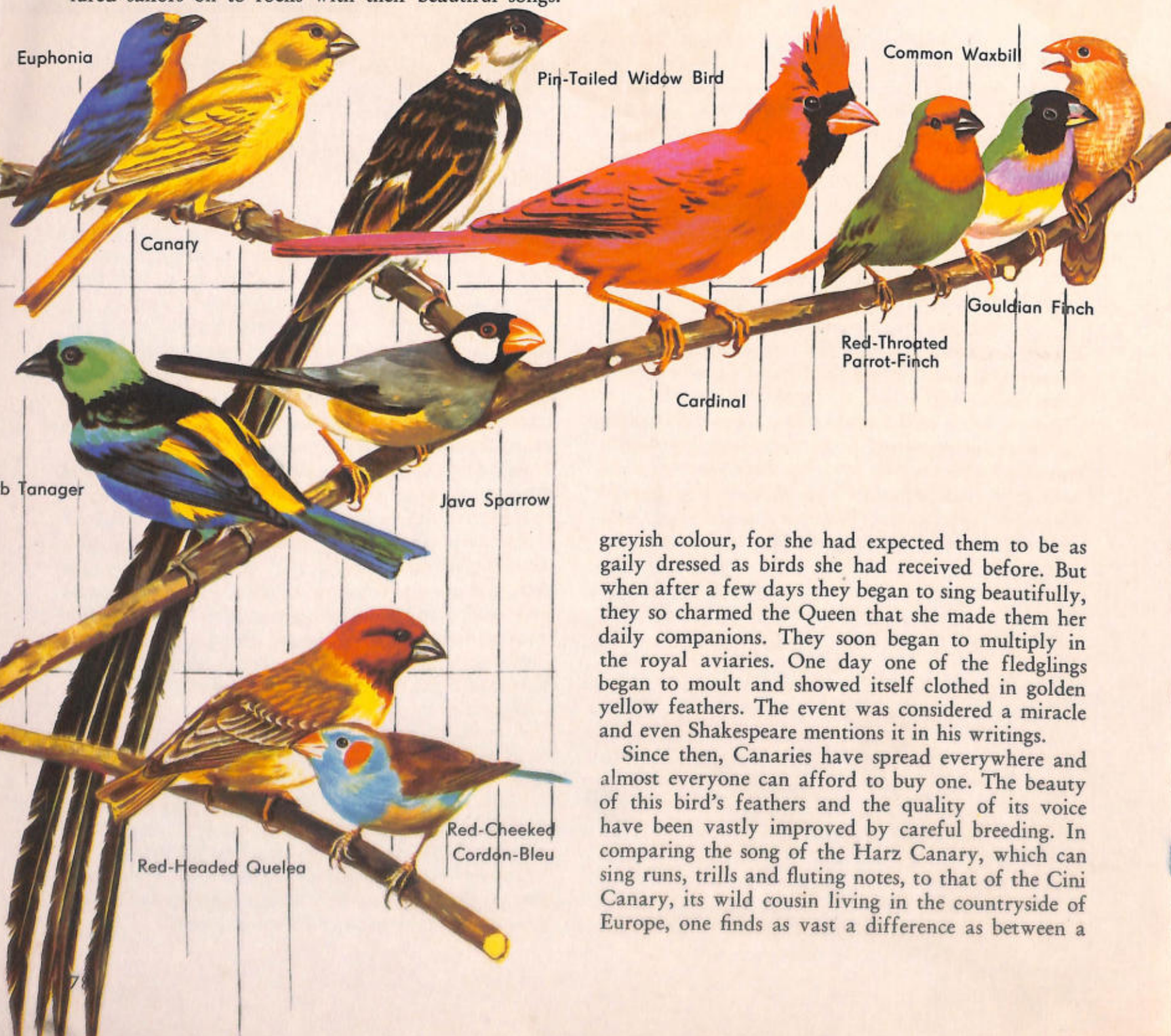
A man who kills birds is deprived of numerous benefits. Birds protect us from many dangers, particularly from insects and rats which would otherwise eat our crops. In every country the beauty and songs of birds are a source of pleasure and enjoyment for those who live near them. You can attract them to your lawn or garden by providing food, water, and shelter. Some birds will come for food tossed on the ground and others only to feeding tables.

Cage Birds and Pest

One day in 1406, in the ancient castle of the Louvre in Paris, Queen Isabella of Bavaria, wife of Charles VI of France, was feeling very excited. She adored animals, especially birds which she kept in expensive aviaries, but on this day she did not have eyes even for her white-feathered Goldfinch in its silver cage. The Queen had heard about some wonderful songbirds which a French nobleman was going to bring her from the Canary Islands.

The nobleman returned to the court with the most marvellous songbirds that had ever been heard in France, the Canaries. The French called them *Serins* after the sirens in Greek legends, the mermaids who lured sailors on to rocks with their beautiful songs.

For a long time Canaries remained luxuries reserved for kings and princes, as they were rare and quite expensive. King Louis XI of France favoured them and bought 330 on one occasion in 1480. A century later the great explorer Sir Walter Raleigh brought some Canaries as a present for Queen Elizabeth I of England. At first she was disappointed at their dull



greyish colour, for she had expected them to be as gaily dressed as birds she had received before. But when after a few days they began to sing beautifully, they so charmed the Queen that she made them her daily companions. They soon began to multiply in the royal aviaries. One day one of the fledglings began to moult and showed itself clothed in golden yellow feathers. The event was considered a miracle and even Shakespeare mentions it in his writings.

Since then, Canaries have spread everywhere and almost everyone can afford to buy one. The beauty of this bird's feathers and the quality of its voice have been vastly improved by careful breeding. In comparing the song of the Harz Canary, which can sing runs, trills and fluting notes, to that of the Cini Canary, its wild cousin living in the countryside of Europe, one finds as vast a difference as between a

talented opera singer and an untrained voice. The Canary is considered the hardiest of cage birds and is naturally clean in habit.

Among other cage birds are Parakeets and Parrots, the latter distinguished from the former by shorter tails and bulkier appearance. Parakeets were brought to Greece from India in 330 B. C. by the soldiers of Alexander the Great. They were a sensation, and the Romans later paid huge sums of gold for them.

It was not until 1840 that the great naturalist Gould introduced the commonest Parakeet to Europe. This was the Budgerigar, which arrived in enormous shipments, as many as 100,000 birds at a time. Budgerigars possess a remarkable ability for imitating human speech. Birds with vocabularies of more than one hundred words have been reported.

In the Middle Ages, Parrots were very popular in Europe. Their popularity was increased by the discovery of new species by travellers. The first bird whose gift for speaking had been noticed was the African Grey Parrot, grey in colour with a red tail. In 1500 a Cardinal paid one hundred gold *ecus* in Rome for one of these birds. Later, Macaws were introduced from America, where the Indians exchanged these gaudy birds for glass trinkets. Later still, when merchants sailed to Malaya for precious spices and to the islands around Australia, they brought back magnificent Parrots, such as the brilliantly coloured Lories. New kinds were continually being discovered, each more beautiful than the last. King Louis XIV of France commissioned his naval captains to buy Parrots at every port of call, so he could present them to his courtiers.

Parrots are still much sought after for their rich colours and their gaiety. They are also popular for their gift as talkers which varies according to species and according to individual birds. The most gifted birds can remember whole sentences which they repeat, sometimes at inappropriate moments.

Some of the most familiar and usual pets are the Greenbodied Parrots, with various head and tail markings of yellow and blue feathers. They are found in their natural habitat from Mexico into Panama, and along the Amazon River.

Parrots live to a great age and some have historic importance. In May of 1929 one died in England which had belonged to Maréchal Massena, a friend of Napoleon. It was the only creature still living at that time said to have spoken with the Emperor, who died in 1821.

Domestic Fowl

CAVEMEN were first and foremost huntsmen. They sharpened and polished flints to make spear heads and arrowheads. Birds provided great delicacies for them, particularly when great flocks of migrants were passing by.

They were able to catch some of the birds alive. They put these live birds in enclosures to keep until they had a poor hunting day. These captives laid eggs, which were considered good eating. Later, probably, a clutch went unnoticed in the shadow near a prehistoric farmyard. Soon chicks hatched from these eggs to the delight of the cavemen who had just discovered how to domesticate animals. It didn't take man long to appreciate the value of poultry, once he had caught his first wild fowl and found its eggs and meat delicious.

The first domesticated fowl was the Hen. This gallinacious bird originated in the warm countries of Asia where it still lives in the wild state. Man brought it with him across Persia and Egypt into Europe. It appeared in Greece in the sixth century B. C., and later in Rome, and in Gaul. The Cock was often thought of as sacred by the Gauls, who made it their emblem, and by the Romans, whose soothsayers considered it could foretell the future.

Since those distant times we have transformed the characteristics of the once wild birds by careful breeding. The colourful fowls in our farmyards would have been unable to survive in the wilderness of their predecessors, but they give twenty times as many eggs as their ancestors, and their flesh is tender and delicious.

Ducks and Geese were domesticated by the ancient Egyptians. There are wall paintings in Egyptian tombs representing each stage in the breeding of web-footed birds. They were kept in fields and gorged with food in a very scientific way before being taken to special markets. Domesticated Ducks are not as far removed from their wild ancestors as are Hens. They can still fly well and occasionally one will escape to fly after a female Wild Duck and start a family with her among the rushes of a pond.

Domestic Geese were much favoured by the Romans whom they once saved from a catastrophe. In 390 B. C., the Gauls had overrun Italy under their chief, Brennus, and the Romans were forced to retreat to the fortress on the Capitoline Hill, which was their only refuge after losing many battles. The Gauls laid siege to this last bastion. They took advantage of a dark night to make a silent advance on the fortress, but they did not take into consideration a flock of sacred Geese. By honking, these birds gave the alarm, warning the Romans who had time to gather their arms and repel the attack. In recognition of this, the Romans held a procession every year in which a Goose richly dressed in gold was led through the city.

The common Domestic Goose is highly prized for its flesh, eggs and soft feathers. Although it has been domesticated for a very long time it shows only slight variation from its ancestors: it is generally lighter in plumage and bigger in size. Two common breeds of

Turkey

Domestic Geese are the Embden and Toulouse. As its flesh is the tastier of the two, the white Embden is preferred for the table, but the grey Toulouse is the better breeder and more numerous. The Chinese Goose is another variety of Domestic Goose that has been bred in Europe and America, and makes delicious eating. African Geese mature early and are favoured by farmers since they are marketable in ten weeks.

Guinea Fowl came from Africa where their wild relatives still inhabit the bush, but it was not until the discovery of America that man tasted the Muscovy Duck. In spite of its name, this bird came from Peru, where it had long been domesticated by the Indians. The domestic Turkey is the only race of poultry that has come from wild stocks native to America. No only was the meat of Turkey relished by the nativ Indians, but they also used its feathers to decora headgear and to make robes and blankets. The Tu key still has wild relatives living in the forests of t United States and in Mexico. It made a notable a pearance in Europe and was considered a royal di It went to Europe in time to replace Herons a Peacocks which were served in the Middle Ages special occasions. These days, people do not eat P cocks, one of the most beautiful ornaments in parks. As for the Heron, its fishy taste makes it pleasant to our palates, which are accustomed to succulent fowl we raise.

Guano Birds

Pelican

CORMORANTS, Boobies and Pelicans, which live in flocks of about fifteen million birds on islands in the Pacific along the coast of Peru, eat a quantity of fish estimated at five million tons every year. In the same length of time fishermen along the coast bring in only four thousand tons in their nets. These strange-looking birds far surpass man in fishing ability.

These sea birds are the world's most concentrated single source of fertilizers. Agriculture makes use of the guano which comes from their droppings to fertilize sugar cane and cotton plants as well as other crops.

The Pacific islands where these bird colonies are established are small and deserted. Nothing grows there and rain never falls. Yet the bird population is incredibly heavy. To approach a colony of over a million Bougainville Cormorants or Guanayes, the commonest of these birds, is to hear a sound like that of a distant squadron of aeroplanes. In the mating season the density of population is twelve birds to the square yard, a record unequalled anywhere else in the world. The birds make mounds of seaweed or stones to rest in. There is an average of three nests to the square yard, with six adults and six young, each couple bringing up at least two chicks. It is difficult for the parents to find their offspring in this crowd, but each bird usually recognises its nest, its mate and its children. The slightest mistake can set off a riot.

The fish which these birds live on are abundant. They are brought by the current from the Antarctic seas to the equator. Little anchovies are especially liked by the birds. It has been estimated that there must be ten thousand million of them in the waters around these Pacific islands, making a total of twenty million tons.

The droppings of the masses of birds accumulate on the islands. Their resting places look as if they were covered by snow. This deposit is allowed to accumulate over several years. Then it is collected with shovels and pickaxes, loaded into ships, export-

Guanay

ed, pulverised and spread on the fields as fertilizer.

This process has been going on for centuries. The Inca kings, whose empire flourished from the tenth century until the time of the Spanish conquest in 1531, organised the collection of guano. Modern Peru goes to great length to preserve this unusual and very profitable natural resource.

Guano is highly valued because it is a general fertilizer, yielding all the ingredients of plant food in a condition that can be readily assimilated.

Cormorants are very skilled in obtaining their prey. They feed exclusively on fish, diving from the surface of the water, seizing their prey, tossing it in the air and efficiently recatching it so that it may be more easily swallowed. Since it can be trained to hunt in captivity, the Bougainville Cormorant has sometimes been called 'the world's most useful bird'. Fishermen in Japan have used this bird's services since ancient times.

Falcon at rest on its handler's hand

Falconry

FALCONS sweep down on plains from high in the air to seize unsuspecting birds and carry their prey off with admirable grace and skill. This gave man the idea of using the services of these birds to hunt feathered game. It was in this way that falconry was born. The Greeks and Romans practised the sport, which was also very fashionable in the Middle Ages. Knights returning from the Crusades in the Middle East were able to perfect their technique after watching Oriental falconers, who were particularly skilled in the breeding and training of birds of prey.

Much patience is needed to train a Falcon or an Eagle to hunt for man's benefit. The bird must first learn to remain quietly on the hunter's wrist, which is protected with a leather glove. Then the falconer trains the bird to take the bait, a piece of the skin of its future prey. When the bird has learned to return obediently to the wrist, it is used to capture various birds such as Pigeons, Quails and Magpies.

Inhabitants of the central Asian Steppes hunt foxes, wolves, roe deer and gazelles, using specially trained Eagles. They follow their prey on horseback with the Eagle sitting on a special saddle. At the right moment they let the bird fly and it kills the animal with its claws and strong bill.

Carrier Pigeons

SENDING messages by Carrier of Homing Pigeon may seem very old-fashioned in this age of electricity and radio waves which make communication with distant places possible, and yet Pigeons are still used today. During the last war, the United States Army used a Carrier Pigeon service consisting of 150 officers, 3,000 soldiers, and 36,000 well-trained pigeons. These birds took part in landings in Europe and in bush warfare in the Pacific and in Burma. Some of their number were the first to announce the success of the landing of parachutists in France on June 6, 1944. Some of these Pigeons received medals usually reserved for people.

The history of the Carrier Pigeon goes back to the earliest times, for the Persians, the Greeks, and the Romans used its services. The 'true' Carrier Pigeon is now rarely more than a show bird, but trained Homing Pigeons are often called Carrier Pigeons, and do the same work. They are trained to return to their cote after being freed at greater and greater distances from it, sometimes hundreds of miles. Later they are encouraged to return to a movable Pigeon house, which is essential in times of war.

Many amateurs breed Homing, or Racing, Pigeons and organize contests to test the speed, endurance and sense of direction of their birds.

Birds and Nature

WHEN a scavenger hovers over a farmyard, the first instinct of a farmer is to shoot it. Condemning this bird to death, he will probably take down his gun to kill it.

But the farmer is not necessarily right in deciding to do this, for scavengers do a great amount of good. They are one of nature's cleaning forces and feed upon dead and decaying animal flesh of all sorts. They seldom attack living animals, though they sometimes may set upon those that are dying and are too weak to offer resistance.

In tropical Africa, huge swarms of locusts descend upon crops. They are followed by thousands of birds of prey, including Storks and Shrikes, which feed on the locusts, thereby destroying millions of harmful insects.

We have employed chemicals in our fight against insects, using many insecticides to spray fields and orchards. This method is very effective, but it is no substitute for birds. A Woodpecker can extract harmful insects hidden in the bark of trees, and a Warbler or Chaffinch finds insects to eat under leaves. Birds are far more effective in destroying insects than are insecticides, which destroy helpful bees as well as crop-eating insects.

To keep birds around us we should leave our surroundings as much as possible in their natural state and not be for ever raking, pruning and chopping. Insects are attracted to a dead or dying tree, and birds are attracted by insects. Woodpeckers and Owls nest in holes of dead trees. We can also provide cover to attract and keep birds secure. Cover can be of many sorts including thickets, bushes, undergrowth, hedges, unkept corners, briar patches, and piles of logs or debris. Each of these provides birds with a shelter and a place where they can rest and hide from their enemies.

Without birds, the earth would be a wasteland. We could never do without these precious helpers. By ridding us of parasites, birds make themselves useful in one of the best of all ways.

Fishing with Cormorants

Passenger Pigeon

Extinct Birds

At the beginning of the nineteenth century, the eastern part of the United States was the scene of a unique spectacle. Huge numbers of Passenger Pigeons, migrating to the Gulf of Mexico, travelled in such droves that they darkened the sky. Millions flew over the land. Their passing inspired shooting parties, where each person tried to shoot more Pigeons than his neighbour. There was no need to be a good shot, for one had only to fire into the thick mass of birds to bag several at one shot. An ornithologist of this time estimated that there were two and a quarter million of these Pigeons in a single flock he saw in Kentucky in 1810.

In the spring, Passenger Pigeons returned in huge flocks to nest in Canada and in the northern part of the United States. Trees bent under the weight of nests, and birds were squeezed together side by side. Again there were great massacres of Pigeons. Trees were cut down and young Pigeons were taken from their nests.

The result of these excesses was a rapid decline of Passenger Pigeons. The big flocks began to disappear after 1850, but the hunting continued. Soon Passenger Pigeons were seldom seen. In 1911 a prize of fifteen hundred dollars was offered to the person finding a nesting pair of these pigeons. The prize was never awarded for every effort was in vain. The last survivor of this species, which a hundred years before had been the most prolific in all America, died in 1914 in the Zoological Gardens at Cincinnati. Man had been responsible for the extinction of the entire species.

When we visit a natural history museum, we look at cases displaying thousands of animals from all over the world. Then we see rooms containing fossils. The bones are all that remain of these animals which disappeared from the earth millions of years ago.

Between these two categories of animals, those which disappeared long ago and those which are still living, are those which are disappearing at the present time. To our shame, most of the animals which no longer exist today but which were living only one or two centuries ago have become extinct because of man.

Some examples are the Moas, huge cousins of the Ostriches, which lived in New Zealand, and the Ma-

Dodo

dagascan Aepyornis. These birds were about twelve feet high. They disappeared in the fifteenth century without ever being seen alive by a European.

The Dodos and Solitaires were huge Pigeons which inhabited a few islands in the Indian Ocean, especially Reunion Island. They weighed more than forty-four pounds and were much sought after by sailors who were short of food. As these birds could not fly, they were soon exterminated in the eighteenth century, either by men or by their dogs which destroyed the eggs even if they could not catch the birds. We have some rather inaccurate paintings of these birds, as well as a few bones, which help to give us some idea of the appearance of the Dodo.

The Hawaiian Islands were once inhabited by splendid birds about the size of a Sparrow but with bright red or yellow plumage. The natives of the islands used the feathers to make royal robes, and so greatly reduced the number of these tiny birds.

New Zealand Moa

Great Auk

Three birds which disappeared in the last century were the Cuban Macaw, the Amazon Parrots of the Antilles, and the Bourbon Island Hoopoe.

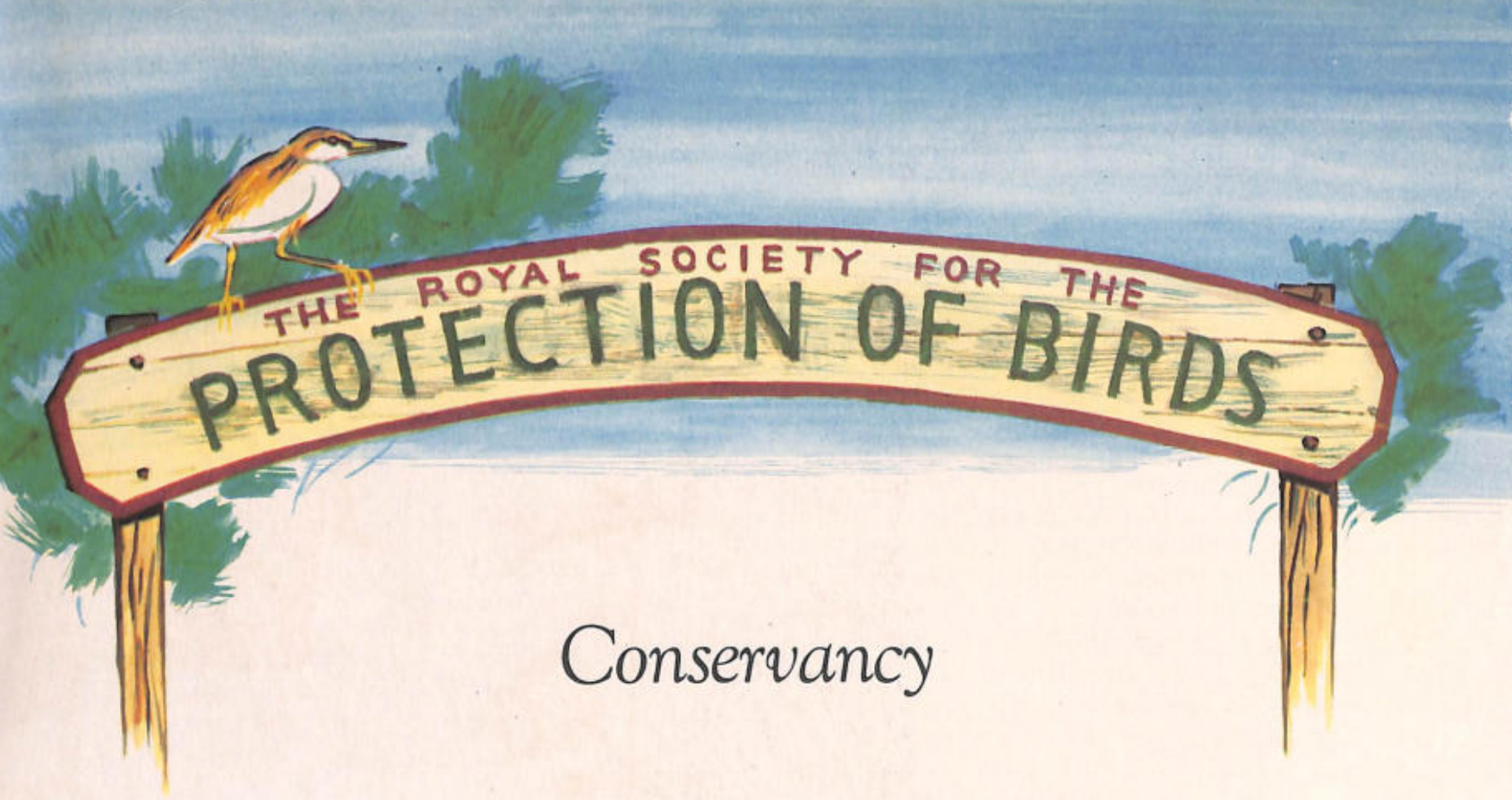
The Great Auks which lived in the cold northern waters once nested along the shores of Northern Canada, as well as in Greenland and Scandinavia. As they were unable to fly because of their very short wings, sailors found them easy to catch. The men either ate the birds or used them as bait for fishing, so the Great Auks, too, began to disappear. The last survivors were seen in 1844 on a small islet off the coast of Iceland where they used to breed.

The lovely Carolina Parakeet was shot to extinction by 1920. The last Heath Hen died in 1931. Numbers of Eskimo Curlews which once flocked over the prairies of America in migration were slaughtered to extinction. The last of this species was reported from Texas in April, 1959.

The list of extinct birds is long: it contains as many as fifty species, all of which disappeared during recent times because of man's lack of foresight.

The list is growing longer, for many species have become extremely rare and are in danger of becoming extinct. The American Whooping Crane is now represented by only thirty-two birds, and it is feared that in spite of rather belated protection it, too, may soon die out.

Anyone interested in birds hopes that there will always be plenty of birds around. To assure this it is necessary to practise wise conservation.



Conservancy

A GREAT many of the world's birds are becoming rare. The cause is the rapid increase in human populations and the need to build houses, factories and the thousand and one things needed by modern civilisation. All this growth requires space and this means taking it from our wild life and making it harder for the birds to find room to live.

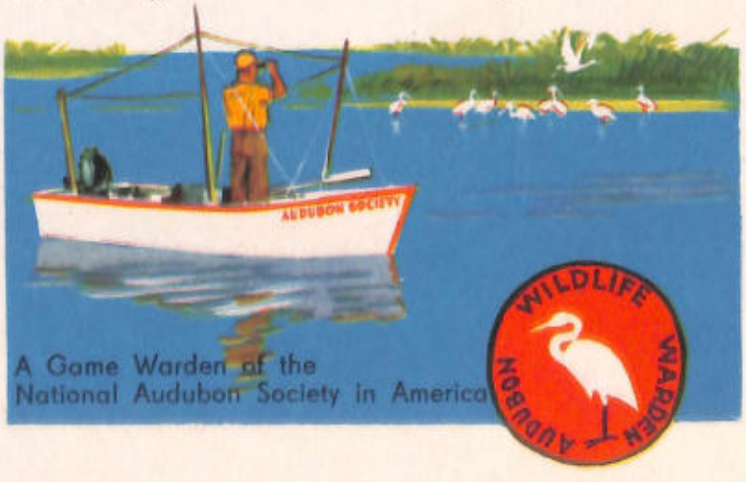
Most birds can live in a particular environment, or habitat, and if this is destroyed they are forced to seek a living elsewhere or die.

To help the birds, some countries have set aside areas of land as sanctuaries or reserves, as for instance the Nature Conservancy's reserves in Great Britain. Hundreds of reserves have been set up all over the world, notably in America and the Commonwealth. They range from the immense national parks in Africa and America to the small reserves where migratory birds can rest during their long flights across the continents.

A great many of these reserves are not owned by governments but are run by voluntary organisations like the Royal Society for the Protection of Birds in Britain, which realised the need for preserving habitats if birds were to survive. One of the most spectacular achievements of the R.S.P.B. has been the re-introduction of the Osprey as a breeding species into Britain, after being absent, through shooting and egg collecting, for about fifty years. Now people go in their thousands to watch, from specially constructed hides, these beautiful birds rearing their young.

Even so, birds are still being hunted and egg collectors still take their toll, but the greatest threat comes from the increasing use of poisonous chemicals which protect the crops from pets. So bad has the effect of these chemicals been that in Britain, for example, some counties have lost many of their birds. In some countries the situation is much worse and it is feared that many birds may well become very rare.

In some Commonwealth countries, as in Britain, many young people help by joining local bird protection groups and by collecting money to help buy and maintain reserves and sanctuaries. In Perth, in Western Australia, children, on first going to school, pledge never to harm birds or animals and to protect them always. In Britain, organisations like the R.S.P.B., The World Wildlife Fund and The Wildfowl Trust have junior sections, while those of sixteen upwards can join the Conservation Corps of the Council



A Game Warden of the National Audubon Society in America

for Nature and help by working on reserves at weekends and in the holidays.

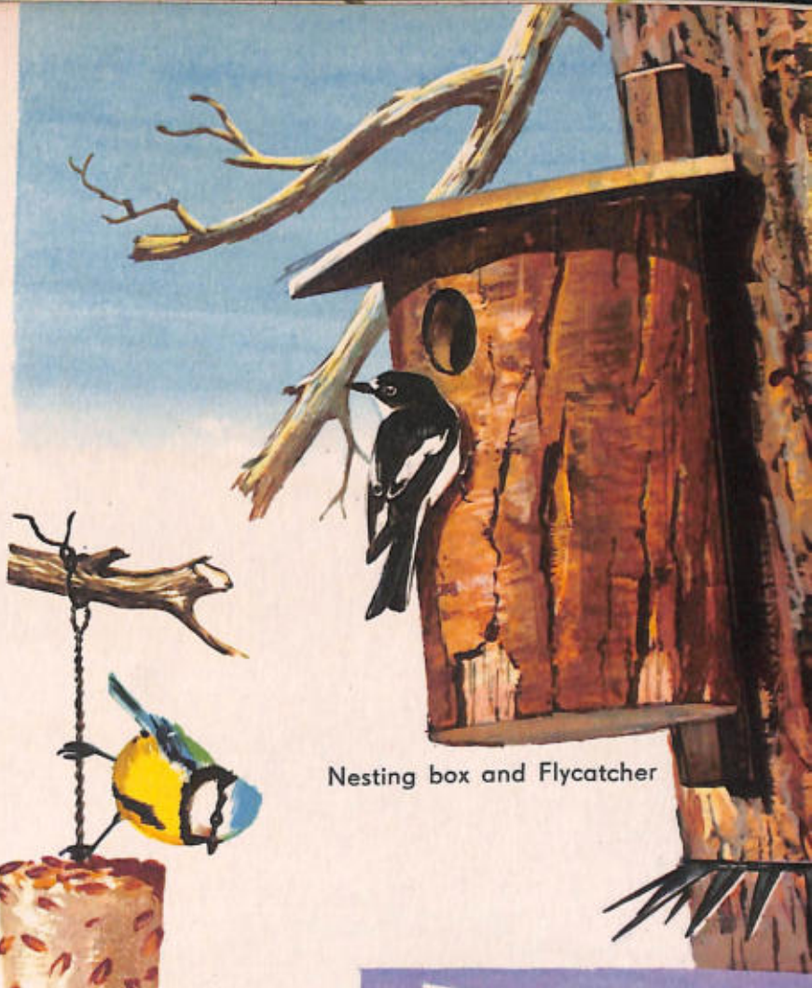
But to make sure that enough space is left for our birds and animals, people must care enough for them, and money must be found. That is why the World Wildlife Fund was started. This fund has already helped by making money available for reserves in Iceland and Spain, as well as emergency operations in Africa and Asia.

These measures to protect our birds are encouraging, but more help is needed and we can all take a part in this work. The first and obvious thing to do is to support the organisations and of course to avoid at all costs disturbing the birds during the nesting season and never to harm birds.

If you have a garden you can take positive action by making it into a sanctuary. By putting up nest boxes on the walls of the house or on the trees, you will encourage a number of birds, like Blue Tits, to use them for nesting. You will have the pleasure of seeing the parents as they return time after time with food for their hungry brood, and one day you will see the young ones emerge and learn to fly.

A bird table with a constant supply of food will also attract many birds to your garden, but these and the nest boxes must be kept safe from cats. We can all feed the birds; even a few crumbs on a town window sill will save many from starvation, but remember, if you feed birds in the winter, it is important to keep it up throughout the entire season as some of the birds may become dependent on you for food. Water, too, is always welcome. In the winter, when the weather is particularly cold and all the water is frozen, a saucer of water kept from freezing by having a small heater under it will save many lives.

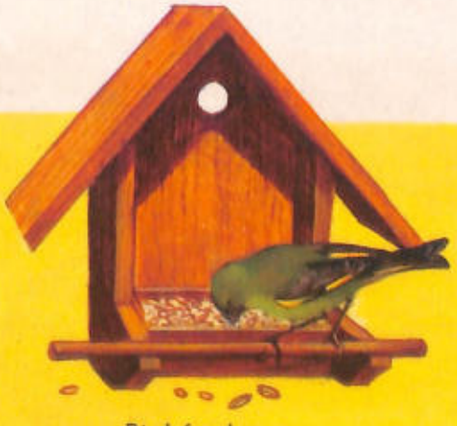
By encouraging birds in these ways we provide them with homes in our gardens, and in return they will give us an unlimited amount of pleasure and a sense of purpose in doing something that helps in the great efforts which are being made to ensure that we shall always have our friends the birds.



Nesting box and Flycatcher

A block of suet and seeds hanging from a branch

Cut-away view of nesting box



Bird feeder

Sheltered bird-feeding table

Did you know that...?

THE WOODCOCK CARRIES ITS YOUNG IN THE AIR

If its nest is disturbed, this careful bird picks up its young between the thighs and carries them to a safer place. It will make many trips back and forth until all its chicks are in the new shelter. Ornithologists have also seen Woodcocks carry their young on their backs. Since it would be almost impossible for the mother to place the children on her back herself, ornithologists believe that the young climb over the mother while she is sitting in the nest, much the way chicks and duckling do. Surprised by a passer-by, the mother probably flies off, and the young clutch her feathers, amazed to find themselves in the air.

THE PAINTED SNIPE HAS SEVERAL HUSBANDS

This member of the Snipe family, who lives in the tropical countries of the Old World, has a nest of grasses and water plants built by her mate near the water in the marshlands. She lays eggs and then abandons them, leaving them in the care of the male who takes complete charge of hatching and raising the young. Meanwhile the mother looks for another mate and repeats the whole process, perhaps several times in one year. The female has more attractive feathers than her mate. She is the one who courts, spreading her wings and tail feathers and assuming curious poses. Like all Snipes she makes a strange alarm note when disturbed and flies off in a zigzag fashion. The roles of the male and female are almost completely reversed among these strange birds.

THE TURACOS ARE NOT GUARANTEED 'COLOURFAST'

These birds of the African forests have magnificent red purple spots on their wings that contrast with the rest of their green plumage. The colouring is brilliant but if the wings are washed in water, the red spots dissolve and colour the water. It was even believed that after a heavy rain these birds' wings were completely discoloured. This red pigment, which does not seem to be protected by the thick, horny layers that usually cover feathers, is related to the haemoglobin of human blood, which explains its strong colouring power.

THE AUSTRALIAN SEA GULL BREAKS MOLLUSK SHELLS BY DROPPING THEM FROM THE SKY

Nature did not provide the Sea Gull with a beak strong enough to break hard shells of certain mollusks found on the beaches of Australia. Having found a mollusk in a coral reef, this resourceful bird picks it up, flies with its catch to the rocky cliffs near the shore, and drops it from a considerable height. The shell breaks and the Sea Gull swallows the mollusk in one gulp. Upon finding such a large mound of broken shells which had been built up through the years, naturalists at first believed they had stumbled upon the site of an ancient civilization, in which the people had fed mainly on shellfish.

YOUNG WEAVERBIRDS HAVE PHOSPHORESCENT MOUTHS

The Weavebird is noted for its intricately woven nests. Some species have nests with one hundred to three hundred compartments. The young Weavers live in closed nests in which there is almost total darkness. Their parents would have much difficulty in finding the beaks of their little ones and filling them with food, if nature had not lined the edges of their beaks with rims of bright yellow and placed pustules of brilliant colour, red or yellow, in their throat cavities. These reflect and shine intensely in the shadows, making effective signalling devices which guide the parents directly to their children's beaks.

BIRDS CAN FLY AT ASTONISHING HEIGHTS

Geese have been seen to fly at a height of 27,000 feet, which poses a physiological problem, because the air is rarefied and the temperatures very low at this altitude. Many migrants that live in Siberia winter in India, making it necessary for them to cross the Himalayas, the highest mountain chain in the world. Godwits and Ducks have also been observed at 16,000 feet, and Choughs at 15,000 feet. But most birds make their trip at much lower altitudes. Little passerines migrate at between one hundred and four hundred feet, some of them even skimming the waves when they cross the sea, in order to be somewhat sheltered from the strong ocean winds.

THE AMERICAN POOR-WILL HIBERNATES LIKE A MARMOT

The small, grey Poor-Will is a western United States species of the Whip-Poor-Will. While many of its summer companions choose to leave the country during the winter season, the Poor-Will shuns migration, preferring to squeeze itself into a hole in a rock, its head turned towards the dark inside. Then it falls into a deep slumber, during which time all its heart and respiratory movements stop. Its temperature falls from 104 °F. to 68 °F., exactly as does that of a marmot. It appears to be dead, but actually it is in a state of deep lethargy from which it will emerge as soon as it feels the first warming rays of the spring sun. The Poor-Will is the only bird in the world known to have this habit of hibernation.

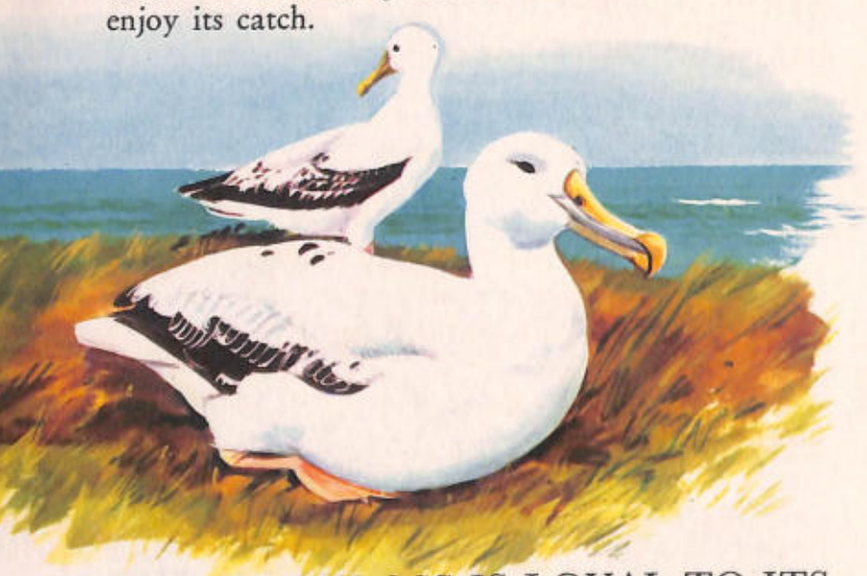
THE GREY PARROT SOWS OIL PALM TREES IN THE AFRICAN FORESTS

The fruit of these palms form nuts with hard shells and with a savoury pulp that is rich in oil. The Grey Parrots crack these nuts with their strong beaks and swallow the pulp inside. Very often they carry a nut off with them to enjoy it in peace, far from other Parrots eager to steal it. But sometimes they drop the nut, losing it in the dense vegetation of the undergrowth. Thus they actually sow the oil palm in the African forests. There is real teamwork between the plant that nourishes the bird and the bird that assures the propagation of the plant, sowing it in new regions.

Did you know that...?

THE AUSTRALIAN BLACK-BREASTED BUZZARD BOMBS THE EGGS IT WANTS TO EAT

The Australian Black-Breasted Buzzard, a bird of prey, is very fond of huge eggs that Emus and Bustards lay in shallow dips in the ground. This bird frightens off its victims by gracefully nose-diving toward the totally exposed nesting bird. Then, as they depart, the Buzzard, rather than break the shell with its strong beak, takes a stone or a lump of hard earth in its claws and drops it upon the egg. After that there is nothing left for the bird to do but to enjoy its catch.



THE ALBATROSS IS LOYAL TO ITS NATIVE LAND

There is a large colony of Albatrosses well established on Midway Island in the middle of the Pacific Ocean. These birds are like giant Gulls, weighing around twenty pounds and measuring about four feet from the tip of the tail to the tip of the bill.

Because these birds are dangerous to planes taking off and landing at this busy air base, it was decided to transplant them to places far enough away to prevent their returning. Some were moved to the Philippine Islands, 4,120 miles away; others were taken to the state of Washington, 3,200 miles from Midway. Nevertheless, travelling sometimes as much as 317 miles in one day, they came home. These records show a highly developed sense of direction in the Albatross.

CERTAIN PARROTS LIKE TO EAT SHEEP

The Kea, a Parrot whose green feathers are tinged with red, has a strong and long beak. It lives in the barren zones of the high mountains of New Zealand. In the past, probably because of the lack of vegetation, these usually vegetarian birds were sometimes forced to feed on the dead bodies of mountain sheep. Several among them developed a taste for meat and began to attack live sheep, landing on their backs and tearing off pieces of flesh until the poor beasts died of their wounds. This habit of the Kea soon caused a price to be put on its head in certain regions in which it lived.

In fairness to the Kea, it must be remembered that only some of them developed a taste for meat; the rest were content to go on with their usual diet of fruit and roots.

THE KIWI FOLLOWS ITS NOSE

This wingless bird, found in New Zealand, is not only a living fossil in the modern world, it also is the only bird with a highly developed sense of smell. A night bird, it frequents humid forests where it hunts worms, insects, and larvae crawling on the ground, varying this diet with juicy berries. It would have great difficulties discovering its prey if nature hadn't provided it with a long beak curved at the end where the nostrils are found. The Kiwi is the only bird that has such a beak. Its sense of smell is extremely acute, enabling it to follow the tracks of its prey or to seek out their hiding places just as a mammal would do.

MOTMOTS PLUCK THEIR TAILS

These South American birds often have long tails, each feather of which ends in a small 'racket' at the end of a long 'stem'. Ornithologists were puzzled for a long time by this absence of barbules along such a great length of each feather and thought that these barbules were probably very fragile and therefore fell off of their own accord. But later is was noticed that the birds plucked them off themselves, by contorting themselves into weird positions and tearing them out with their beaks. No one has yet found the reason for this strange behaviour.

BIRDS CAN BECOME DANGEROUS FIREBRANDS

Birds have been seen to dive on burning cigarette butts that passers-by have carelessly dropped in the street, and carry them in their beaks to their nests. The straw and dry twigs catch fire very easily, and a burning nest is enough to start a fire in a building or a forest fire. Choughs have been seen carrying burning pieces of straw and thus spreading a fire.

THE OYSTER CATCHER WOULD LIKE LARGER EGGS

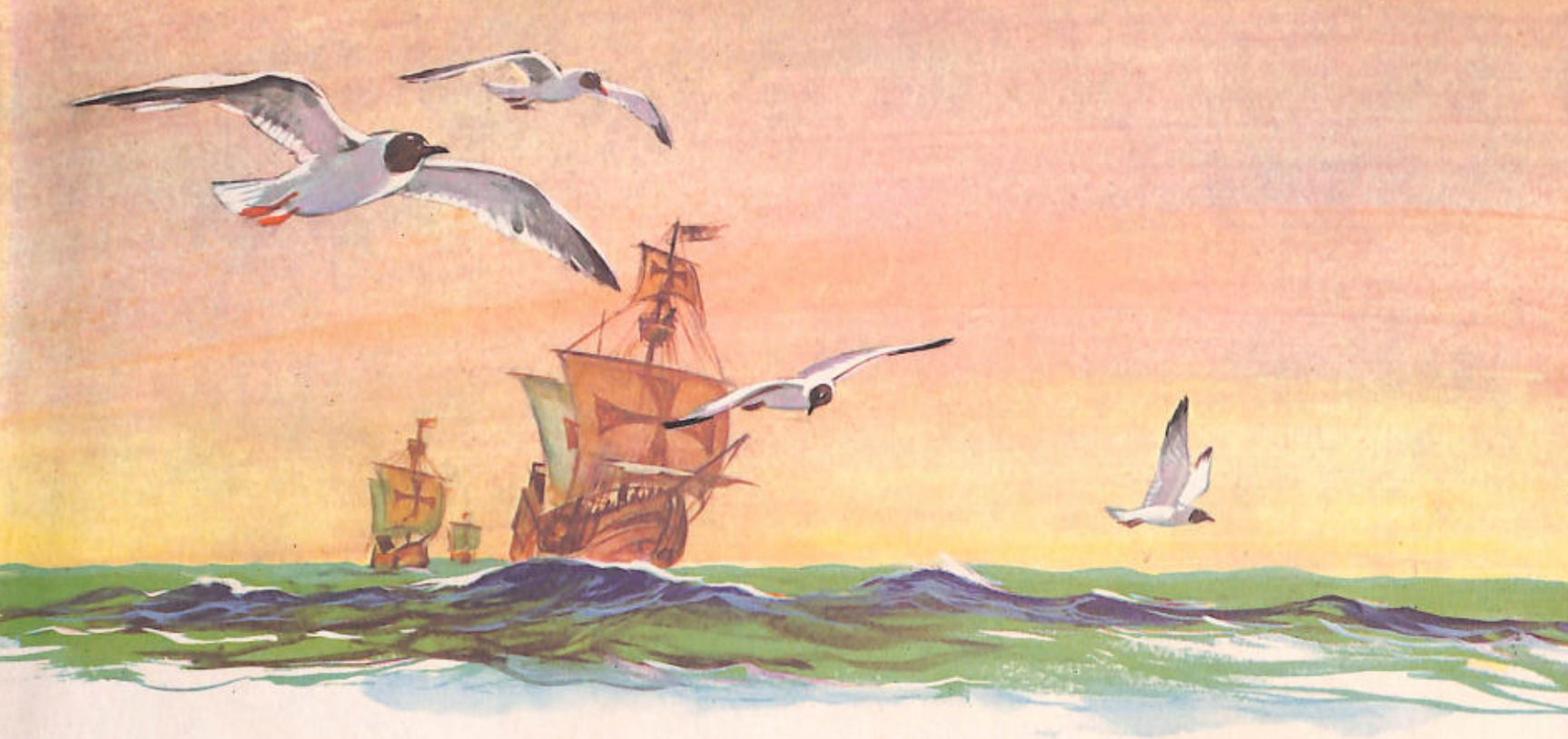
Experiments have been made proving that if a model egg, similar in shape and colour to the Oyster Catcher's egg but three times as big, is offered to this bird, it will quickly adopt it in preference to its own. Abandoning its own smaller eggs, it will devote its attention to the large artificial one, making great efforts to sit on it and cover it.

STORKS ARE AFRAID TO FLY OVER LARGE EXPANSES OF WATER

Storks are much afraid of flying over water, unless the opposite shore is in sight. Probably this is because of their gliding flight, for which they need to use the rising and falling air currents found more over land than sea. This fear is the reason for the narrowing of their migration route over the Strait of Gibraltar and the Gulf of Suez, to avoid crossing stretches of the Mediterranean.

BIRDS NEVER HAVE CRAMP IN THEIR FEET

Because of their structure, birds' feet are free from cramps. The muscles and tendons of perching birds are so made that when the bird lands, the claws close automatically around the branch and assure a strong hold. In this way birds are able to perch for a long time without contracting their muscles, and they are also able to go to sleep without falling from their perch – though you often see a bird ease its toes from time to time.



CONCLUSION

When Christopher Columbus sailed in 1492 to find a westward route to the Indies, he made careful notes in his logbook of the names and numbers of birds he saw on the way. When after a time the sea became quite deserted for days on end, the crew lost all hope of finding land in the west and began to mutiny. Then suddenly a few Gulls appeared, followed by some land birds which came to perch on the ships. The sailors calmed down and their spirits rose. Land is near they realized, and soon Columbus sighted what he thought was India.

Without the hope these birds inspired, the sailors might not have had the patience to wait for the journey's end. The expedition would have been a failure.

There are many historical incidents in which birds played an important part. When the European colonists penetrated into the western part of the United States, a group of pioneers settled around Great Salt Lake. In spite of difficult conditions they managed to cultivate the land and grow flourishing crops. When swarms of locusts descended on the fields to eat their crops, the settlers panicked, fearing they would lose everything. But Gulls followed the throng of locusts and fed on the pests, saving the pioneers' crops. To commemorate this occasion a monument was erected to the glory of the Gulls.

Legend has many tales about birds. The people of ancient Egypt worshipped a bird-god, Horus. This god had the head of a Falcon and the body of a man. In the struggles after the Crusades, the Saracens asked for and got Greenland Gyrfalcons as ransom for captured Christian nobles. The ancient sport of falconry was popular with kings and nobles who trained Hawks to hunt other birds and small animals.

History is full of references to birds, which show the pleasure, profits and marvels they bring to us. It has always been to man's advantage to preserve and protect the birds of the world.

KEY TO THE BIRDS ON THE JACKET

All these birds are Europea

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