

INTRODUCING
BIRDS



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A bird in flight has always made men envious. We all long to overcome the force which binds us to the earth. For ages men have dreamed in vain of being able to fly up into the air, to soar above the mountain peaks and over the oceans, and to look down from above upon this world of ours as though it were a mere toy-land. For centuries people have jealously watched birds in flight, trying to capture the secret of motion at high altitudes. Thousands of crude experiments, as well as technically ingenious ones, have been carried out in an effort to imitate the flight of birds, and hundreds of human lives have been sacrificed to the fulfilment of the dream that man, too, would one day be able to take to the air and fly.

That dream has been fulfilled. Indeed, today men fly through the air at speeds and altitudes that even birds cannot reach. But the most complex modern aeroplane still shows how much it owes to the birds from which it was originally copied. Even we, to whom the sight of aircraft racing across the sky at supersonic speeds has become a commonplace, are still enchanted by the beauty of birds in flight. Even we, experiencing the triumph of flying high in the air, cannot help but admire the physical equipment and grace of our feathered predecessors.

We admire the perfect organism which enables them to keep their balance and prevents them from feeling dizzy; we admire the economy of breath and movement of these small, fragile creatures who traverse thousands of miles during their spring and autumn migrations; and we admire the miraculous powers of the bird's eye. The human eye needs the help of a powerful pair of binoculars to see even faintly things which a bird will see quite plainly from the same distance; and, on the other hand, an insectivorous little bird will at close quarters notice a minute butterfly egg which we would only be able to see under a microscope.

Then there is the carefree, lively behaviour of birds even in time of adversity. Our critical human intellect assures us that this is due entirely to the lack of a higher degree of intelligence; but that does not prevent us from finding it delightful and refreshing to watch birds hopping about and chirruping merrily, regardless of cold or hunger. No doubt this is why men have always visualised the legendary messengers from happy worlds as winged beings.

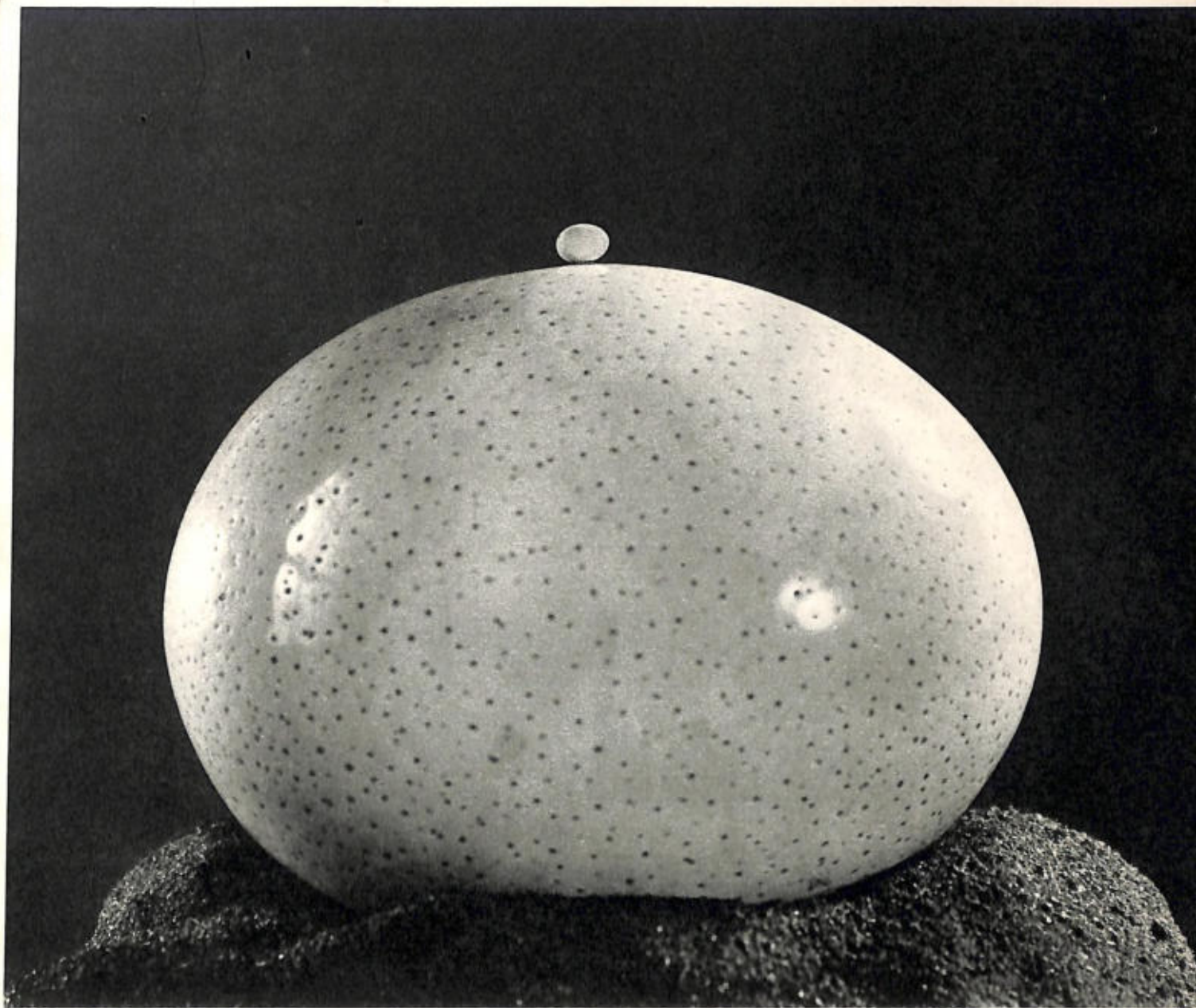
The very words *bird*, *wings* and *flight* are so closely linked together in our minds that birds which do not fly seem to us to be rarities. Yet we know quite a few species of non-flying birds, and there is evidence that there were many more of them in ancient times. This picture book shows some of these non-fliers, as well as other birds of exotic appearance which are not very frequently seen. Before we start looking at them, let us recall something that at first may seem a trite commonplace: every bird is hatched out of an egg. But... which came first, the hen or the egg? This is by no means a new question: it is one which has not infrequently embarrassed even experts when a straightforward answer has been demanded on the spot, without time to think it out. It is usually difficult to answer an uncompromising query from a layman, and biologists in particular do not like to cope with such questions, since the reply can rarely be as simple as the blunt, perfectly logical question.

If the question is meant literally — that is, if we are really speaking of a hen as we know it — then the answer is that the egg came first. But, it will be argued, something had to lay that egg! This is quite true, and the most probable answer is that the original egg was laid by a direct ancestor of the modern hen at a time when hens as we know them did not yet exist. Naturally, the development of life upon the earth took place extremely slowly, so that it is difficult to distinguish the hen of today from the bird from which it is descended.

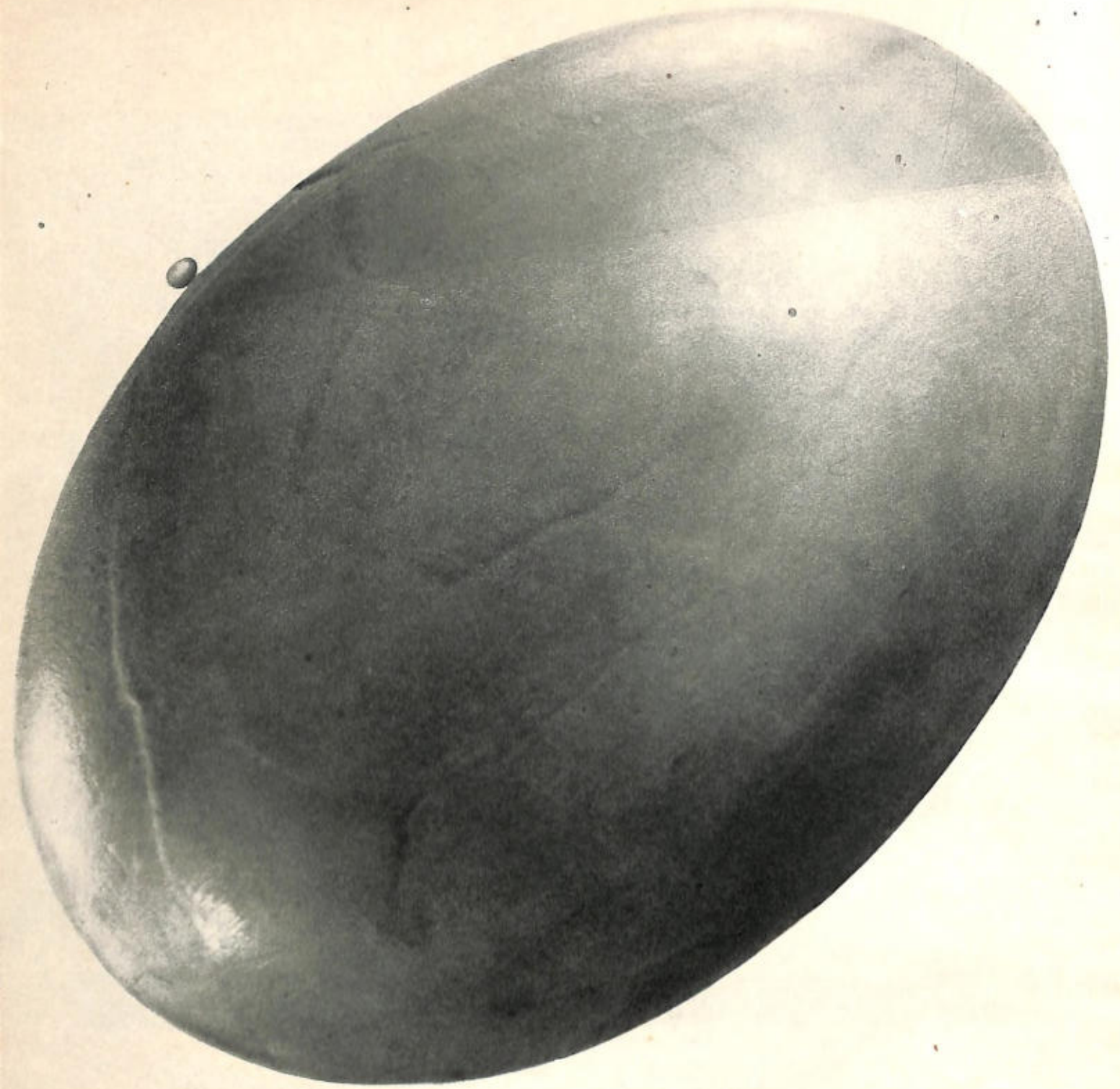
If we are speaking in a broader sense and, though saying a hen, mean birds in general, then again we must reply that the egg came first, because the creatures from which the birds of today developed also used to lay eggs. They were the various saurians which inhabited our planet in the Mesozoic period, some of them being veritable giants among the creatures of the earth — so that, of course, their eggs were also huge.

This, however, has taken us rather a long way into the past. Let us now return to the living descendants of those ancient saurians and pterosaurs; let us see what they look like and how they live today. The world is so large and nature so multifarious that an observant, perceptive human being hardly knows what to look at and admire first. And nature will often surprise us so that we feel very much like a young fledgling, venturing out of its nest for the first time.





As all birds are hatched out of eggs, let us begin by examining one or two of these birds' eggs. The eggs reflect the considerable differences in size between the various kinds of birds, the greatest difference in the case of birds existing today being between the egg of an African Somali Ostrich — *Struthio molybdophanes* — and that of a humming bird, one of the smallest birds known to exist anywhere. The eggs in our picture are reproduced in actual size — the ostrich's egg weighs almost 3 lb., which is the equivalent of some 24 hen's eggs.



Not so long ago huge ostrich-like birds — some of them as much as from 9 ft. to 18 ft. tall — were still living in New Zealand and Madagascar. The last survivors were exterminated some four hundred years ago, or possibly even more recently. Had it not been for human folly and an unthinking destructive urge, we should still today be able to admire the largest birds ever to have lived upon our earth. Their skeletons and their huge eggs, which were excavated later, show us how enormous these birds were.

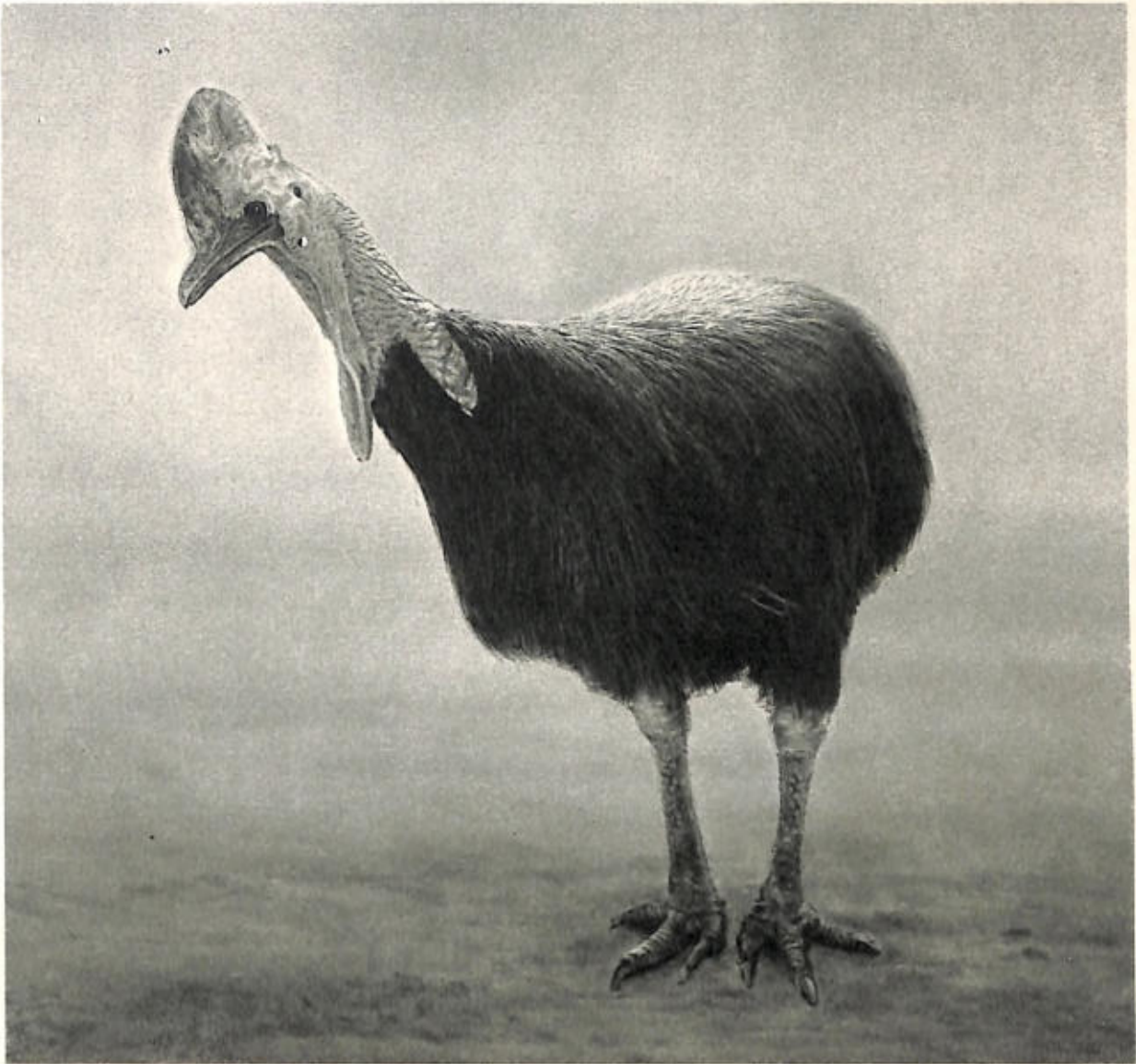


Even the African Ostrich would look small in comparison with the giant birds from Madagascar. The picture on the opposite page shows an accurate cast of the egg of the extinct non-flying bird, *Aepyornis maxima*, reduced to about two-thirds of its real size. Next to it, by way of comparison, is the egg of a humming bird. The giant Madagascar birds had eggs as long as 12 in. These eggs had a volume of about 2 gallons, or the equivalent of 6 ostrich's or 148 hen's eggs. And it would take a total of 50,000 humming bird's eggs to equal the volume of a single egg of this extinct giant.

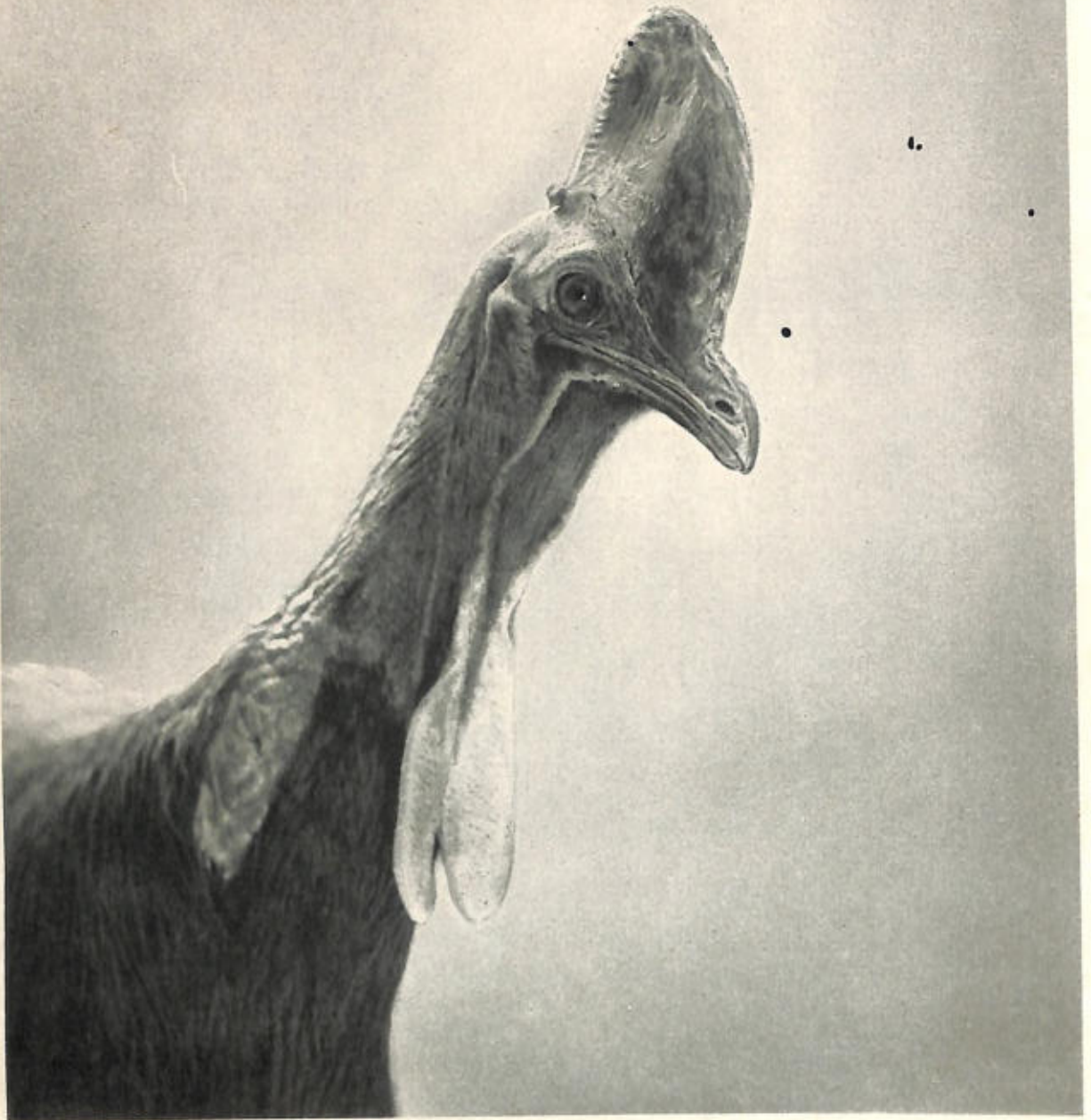
The biggest birds living today are ostriches, of which we know four species, all of them living in Africa. A male North African Ostrich — *Struthio camelus* — may be as much as 9 ft. tall and will weigh about 2 cwt. The ostriches of the *Struthio* genus originally came from North and East Africa and the adjoining parts of South East Asia. In the nineteenth century, when they were exterminated in North Africa and Palestine and were rapidly disappearing also from parts of Central Africa, many ostrich farms were established to breed these strange birds in captivity. In this way they spread to South Africa, to Australia, Argentina, California, and elsewhere. After ornaments made of ostrich feathers went out of fashion, the ostriches from some of the farms were set free and reverted to the wild state. The North African ostrich is a native of the veldt and the prairie; it will also live in deserts if they are not devoid of vegetation. It lives on low-growing plants, insects, and any small animals it can find. Ostriches are extremely wary and exceptionally shy animals, running away quickly in case of any danger. They cannot fly, their flight- and steering-feathers being transformed into the soft and curly 'ostrich feathers'. The male and female birds take it in turn to sit on the eggs, which number about 15 and are laid in a slight hollow scooped out of the ground. The male will defend the nest with the greatest courage and will attack any large creature that happens to come near it. He is not even afraid of humans, but will attack them too, using his strong, two-toed feet, similar to hooves, to knock them down and inflict dangerous injuries. Even though

it is not very intelligent, the ostrich can nevertheless be partly tamed. The history of ancient Rome tells us that ostriches were in those times used by the well-to-do as draught animals when driving out in state. The picture shows a female ostrich in front with a male behind her. In the background a Saiga antelope can be seen grazing.





The running birds known as *Struthioniformes* also include the cassowaries — *Casuariidae*. These are heavy and sturdy non-flying birds, somewhat resembling ostriches but smaller; real cassowaries are only a little over 4 ft. tall. Their feathers are narrow and ribbon-like, the pinions and steering-feathers being undeveloped. Instead of pinions, adult cassowaries have on each side about five bare, tough, horny quills. On their heads they have a high comb, usually flattened at the sides and stiffened with a light, cellular bone. The head and parts of the neck are almost bare and very vividly coloured, as a rule in reddish and bluish hues.



There are about ten species of cassowaries, the young birds with undeveloped characteristic features such as the comb on the head being very difficult to distinguish. The cassowaries live in New Guinea and on some of the smaller islands in its vicinity, but may also be found in the uninhabited parts of Northern Australia. They are shy forest birds which roam about in small flocks and live on fruit and small animals such as frogs and lizards, as well as on insects. In captivity they are ill-tempered and can even be dangerous to humans, whom they like to attack, knock down and kick.

A young male cassowary with the as yet undeveloped comb on top of its head. This is the same bird as that depicted on page 14 — there the photograph shows it fully grown three years later. It belongs to the Common Cassowary species — *Casuarius casuarius*.



In the extensive flat deserts of Australia lives a bird similar to the cassowary but somewhat larger in size and without the striking comb on top of its head. When fully grown it attains a height of almost 6 ft. and is thus the second largest bird after the ostrich. It is called the emu — *Dromiceius novaehollandiae*. The emu has the same three-toed powerful legs as the cassowary. Its neck is covered with feathers almost up to its head, only the skin at the sides of the head and underneath the beak being bare, and greyish-blue in colour. The short, useless wings are concealed by the soft feathers and are therefore hidden from sight when the bird is standing still. The emu feeds on low-growing plants and various small living creatures. The female birds lay about 8 dark green eggs. The eggs have a rough surface and are laid on the ground, the male alone sitting on them patiently for a period of two months. The male also looks after the chicks once they are hatched. Emus acclimatise themselves quite well to European climates and will stand even severe winters in the parks in which they are sometimes kept.





Three species of ostrich-like birds are to be found in the grassy pampas of South America. The best known of these is the Common Rhea — *Rhea americana* — a bird slightly smaller than the emu (the rhea will not grow to more than about 4 ft. 6 in.) and having feathers of a lighter, greyish colour. With the exception of the legs it is completely covered with feathers. Its wings are far better developed than those of the emu and the cassowaries, but none the less it cannot fly. The rheas live in small flocks together with other animals such as the pampas deer. They eat berries, seeds, low-growing plants and small animals, and have a predilection for places where there is access to drinking water. At nesting time five or six females lay their eggs in a common shallow nest on the ground, the males taking care of the hatching and of the young birds. Hunts on horseback used to be — and unfortunately in some parts still are — organised to capture or kill the rheas, the birds being either caught in lassos and bolas or hunted down by packs of dogs.



The non-fliers also include penguins, of which some sixteen species are known to us, grouped under the heading of the order *Sphenisciformes*. Certain of these species will grow up to 3 ft. high, but the majority of penguins measure only about 1 ft. 6 in. They walk, or rather waddle, upright on short, strong, web-footed legs placed well back under the body. When standing, they lean on a short, fleshy tail. The penguins have thick, scaly feathers, their wings being flat fins covered with feathers reminiscent of fish scales. Penguins live on sea fish. They inhabit the coasts and islands of the southern hemisphere around South Africa, South America and Australia. Some of the species of penguins live in the Antarctic, others in the Galapagos Islands right on the Equator. Large colonies of penguins make their homes on the mainland or on the ice, daily venturing out to sea in search of food. They live in pairs and each year bring up one or two young. Their eggs are much sought after by predatory sea birds, for which reason some kinds of penguins protect them by carrying them around wherever they go, hidden in a special fold of their skin between the thighs and belly.

The Black-footed or Jackass Penguin — *Spheniscus demersus* — shown in our picture is about 1 ft. 6 in. tall. These birds live in their thousands on the islands near the southernmost tip of Africa and are saved from extermination by the laws of the South African Union. Pairs of them live in holes which they all dig together. The underground corridors are as much as 3 ft. long. They prefer to dig under flat stones which then serve as strong ceilings for their homes. Some of the burrows are linked with one another, so that a kind of system of underground passages exists.



The slightly larger Royal or Golden-crested Penguin — *Catharactes (Eudyptes) chrysolophus* — which comes from the Antarctic coast, may also occasionally be seen in captivity. The adult birds have tufts of golden-yellow feathers at the sides of their heads, coming together on the forehead. The bottom picture shows a Royal Penguin in his element — in the water. Those who first see penguins tottering about clumsily on land are apt to be surprised by their agility when swimming; they paddle with their fin-like forearms and use their legs to steer. In the water they remind one of seals and sea-lions, gliding around with the speed of fish.



The interesting inhabitants of the sea coasts also include the gannets, which belong to the *Steganopodes* group of sea birds. The birds of this order are best recognised by their feet, all the four toes being joined by a web. Gannets live on the coast and on islands, particularly in sub-tropical and tropical seas, being most numerous near Central and South America, further in the South Sea islands, in the vicinity of New Zealand, on the islands north of Australia, in the Red Sea, and on the south and east coasts of Africa. Altogether there are seven different species, the one that lives farthest to the north being the white European Gannet — *Sula basana*. This species inhabits the rocky coast and islands in the west of Great Britain and Ireland, west of Norway, the Faroe Islands, Iceland and the easternmost tip of North America. It is a beautiful white bird the size of a goose, having a yellow neck, brownish-black pinions, and special markings on the head. These gannets nest in huge colonies numbering several thousand on inaccessible rocky promontories high above the tumultuous ocean. In the summer each pair regularly brings up a single young. With their long wings looking not unlike motionless crosses the gannets sail gracefully through the air past the rocks and reefs, suddenly to dive with astonishing swiftness into the waves to catch a herring or some similar fish for their dishevelled offspring. When winter is approaching the gannets leave their native rocks and fly over the ocean towards the south, to the temperate and sub-tropical zone.

The picture on page 6 shows a gannet in flight.

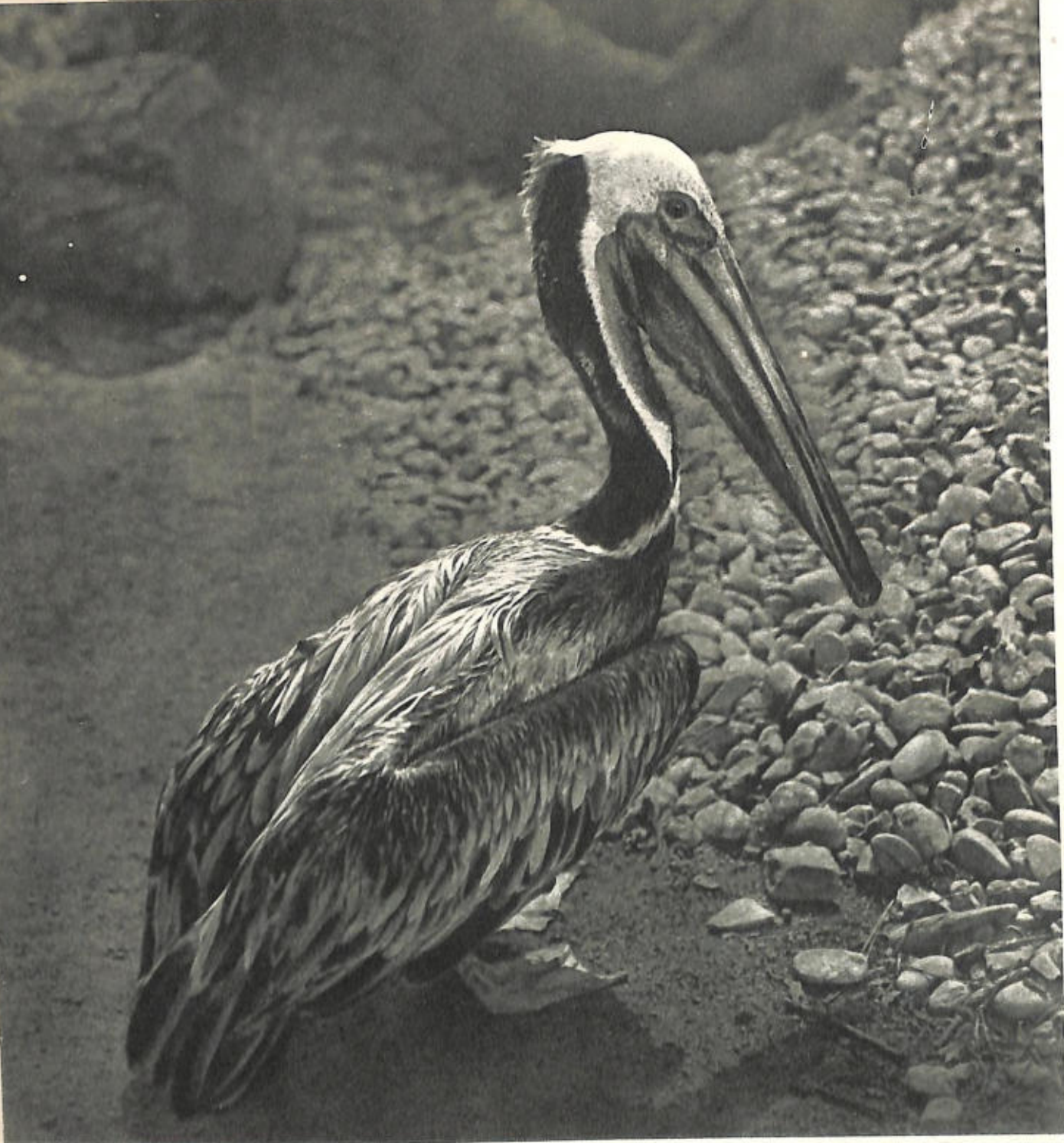




Pelicans also belong to the *Steganopodes* group. They include eight species, two of which live in the Antarctic. The Common or White Pelican — *Pelecanus onocrotalus* — has a wing span of as much as 7 ft. Its white feathers are coloured a soft pink in the spring, the feathers on its chest becoming yellow. Only the pinions are partly blackish-brown. The pelican has a huge, sack-like crop of membraneous, pale yellow skin stretched below its bill. It serves as a kind of fishing net. As the skin of this 'net' is all in one piece without any holes, the pelicans pour out surplus water over the edges of the crop when fishing. Unable to dive under the surface, these birds fish in groups, swimming in line towards the shore and beating the water with their wings, thus driving the fish on to the shallows where they can catch them more easily. Pelicans nest in extensive swamps, overgrown with vegetation, particularly near the estuaries of large rivers where great stretches of water are to be found. There are pelican colonies in various parts of South East Europe, South East Asia and India; in Africa they are most numerous in Egypt. Pelicans are excellent fliers, able to stay high in the air for long periods of time. Of course, a pelican who has just finished his lunch and is sitting on the river bank does not look the superb flier and skilful fisher that he really is.

The Crested Pelican — *Pelecanus crispus* — is bigger than the preceding species; indeed, he is the biggest bird living in Europe today. He can be distinguished from the Common Pelican by the fact that he has a larger crest on his head and curly feathers all over the back of his neck. The crop is orange-coloured in the spring, while the iris of the eye is yellowish-white as compared with the dark red iris of the Common species. The feathered tip at the top of its bill is shaped like a tongue and runs along the bill in the case of the Common Pelican, but in the case of the Crested Pelican it is wide and extends far down the bill where it divides in two. In the spring the latter's feathers assume a greyish-white rather than pink colour. Its legs are also greyish, those of the Common Pelican being flesh-coloured. The Crested Pelican has a wing span of not much less than 9 ft. Pelicans build their nests among thick reeds. There are always large colonies of them in any one place, the females laying two or three eggs each. They are extremely cautious and shy, but will become tame and trusting wherever they are protected. In captivity they grow completely tame.





In the warm and tropical parts of America lives the Brown Pelican — *Pelecanus occidentalis*. It is much smaller than the other two species, but lack of inches is compensated for by a more attractive appearance, as it has beautifully coloured feathers with predominantly white, black, brown and grey markings. Its mode of life is similar to that of the European species, perhaps the only difference being that it nests in the shallow parts of the sea coast. There they live in such great numbers that, together with the gannets and a few other sea birds, they are the chief producers of the accumulated layers of guano from which comes the famous Chile saltpetre.

The ibises (*Plegadi-
dae* family) are repre-
sented in Europe by the
Glossy Ibis — *Plegadis
falcinellus falcinellus*. It
is a fine bird, larger than
a hen, with glossy, dark
reddish-brown feathers.
It lives in flocks in
swamps near lakes and
in the vicinity of the sea
coast, particularly in the
south of Europe, as well
as in the southern parts
of Asia as far east as
India. The Glossy Ibis is
also to be found in the

Sunda Islands up to New Guinea, in the north eastern parts of North America, in North East Africa, and in Madagascar. Its nests are built either in the reeds or in bushes growing near water, and it feeds on water insects and small animals.



The marvellous Scarlet Ibis — *Plegadis ruber* — lives in the central parts of South America and in parts of Central America. It is exactly like its European counterpart, but its feathers are, as its name indicates, of a beautiful scarlet colour. In its way of life, too, it resembles the Glossy Ibis. It is frequently to be seen in zoos, where it is one of the most decorative inhabitants of the ponds.





The African Sacred Ibis — *Threskiornis aethiopicus* — is somewhat larger and sturdier than the Glossy Ibis. Its feathers are white, the adult birds having a black head and neck. Above the tail, a bunch of finely spread feathers sticks out. The ibises are at home in practically the whole of Central Africa, whence they used in ancient times to fly up along the Nile into Egypt. Since they used to appear after the rains, when the level of the Nile rose and the waters of the river flooded the drought-stricken countryside, the Egyptians worshipped these birds, ascribing magic powers to them and making up countless legends and fables about them. Thousands of mummified ibises have been discovered buried in the pyramids, while their likeness was often carved on stone tablets, just as with the sacred *scarabaeus* beetle. The ibis lives on locusts and other insects and on various small vertebrates. Some observers (Ch. Kearton) accuse it of plundering the nests of penguins living in colonies on the African coast. The Sacred Ibis builds its nest in the trees, mainly in the marshes and in inundated forests.

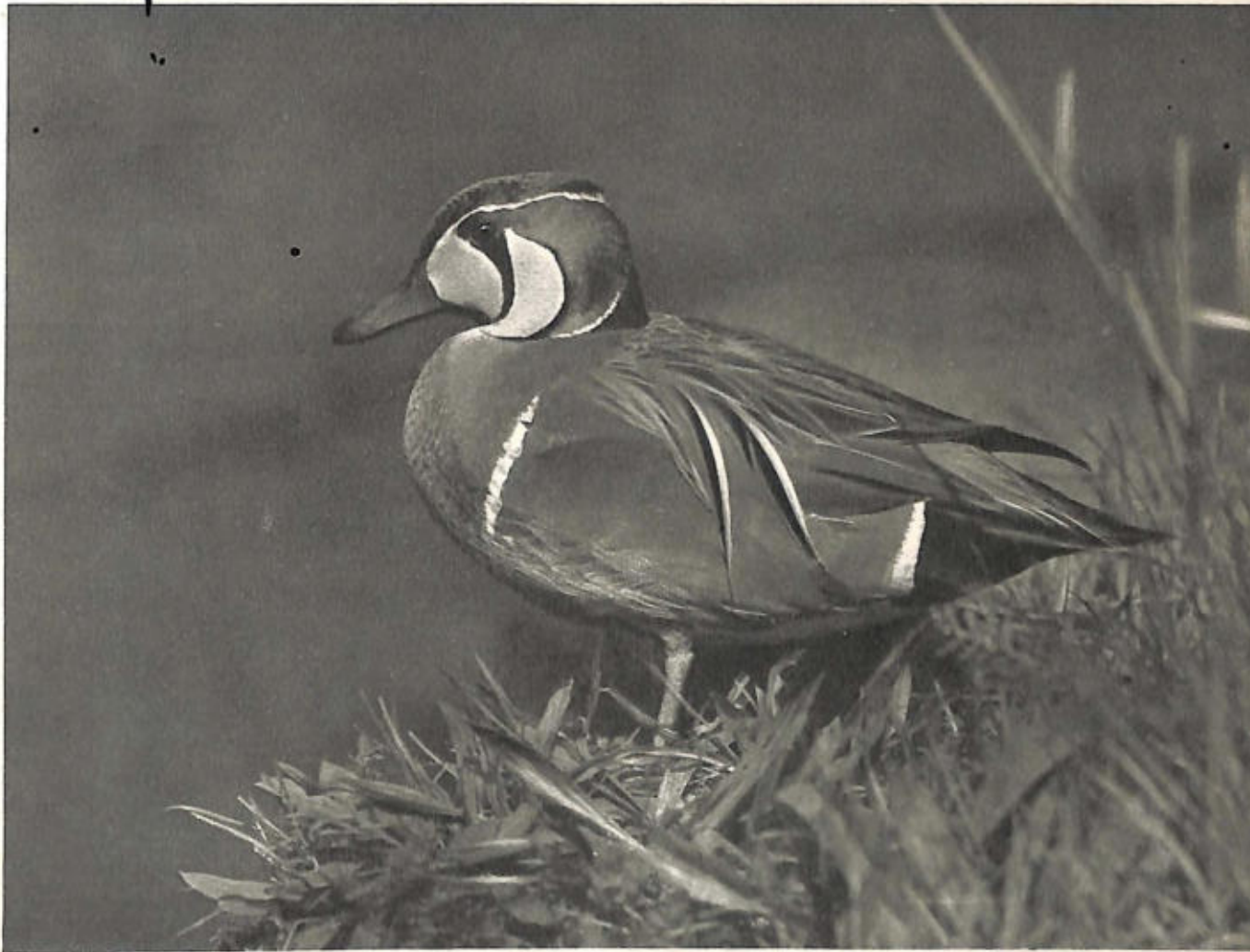
The Spoonbill — *Platalea leucorodia* — is also one of the ibis family. This is a fairly large bird, only slightly smaller than the familiar stork. It has white feathers, black legs and a black bill, which is flat and broadens out at the end into a kind of spoon. At nesting time the spoonbills have decorative lengthened feathers,

yellow in colour, on their heads, the underside of their necks also being yellow. The spoonbill lives in the south of Spain, in South East Europe and farther east in South East Asia as far as India, in the vicinity of the Red Sea, and on the coast of east Africa. It winters in tropical Africa. Its customary habitat includes marshes and the reed-beds of large rivers and lakes, as well as the sea coast, where it usually nests in numerically large colonies. In the reed-beds it nests on the ground, though it may sometimes build its nest in low trees near the water. As a rule a pair of spoonbills will have from two to four young. The main food of these birds consists of water insects and their larvae, crustaceans and molluscs, and small aquatic animals. A flock of spoonbills in flight presents a beautiful sight — they seem to swim slowly through the air, their necks stretched out in front and only slightly curved, their legs stretched out behind, placed close together. They glide and circle around in the air, the feathered tufts on their heads being indiscernible as they are laid flat at the base of the neck.

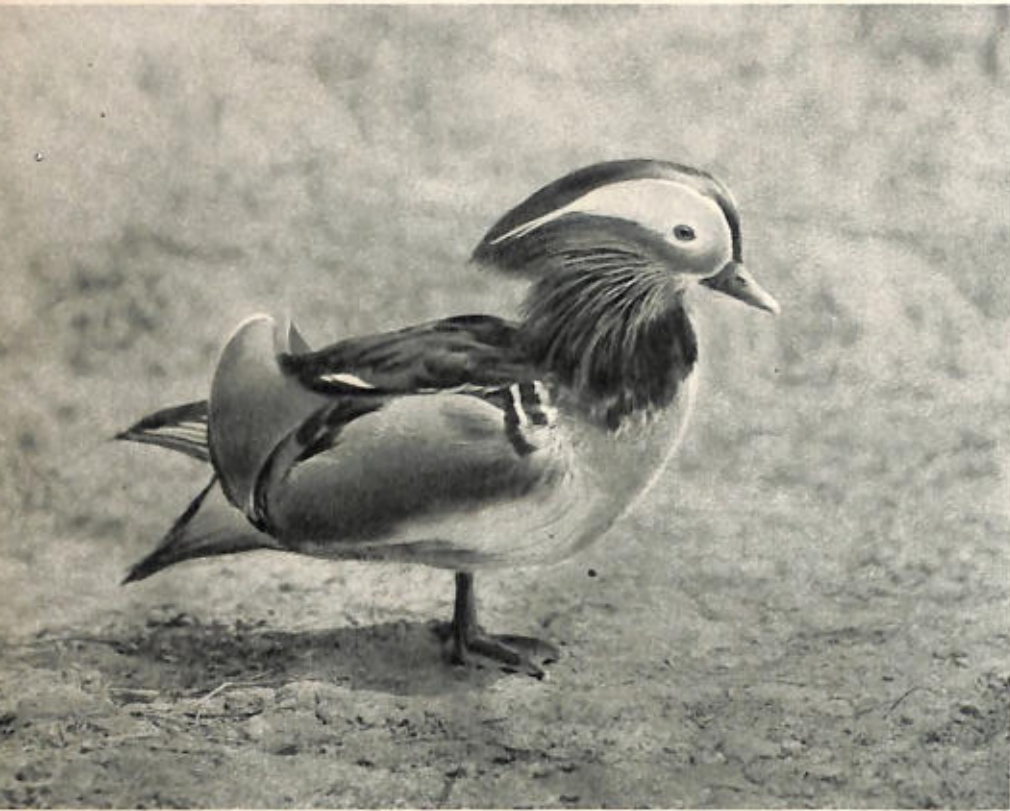




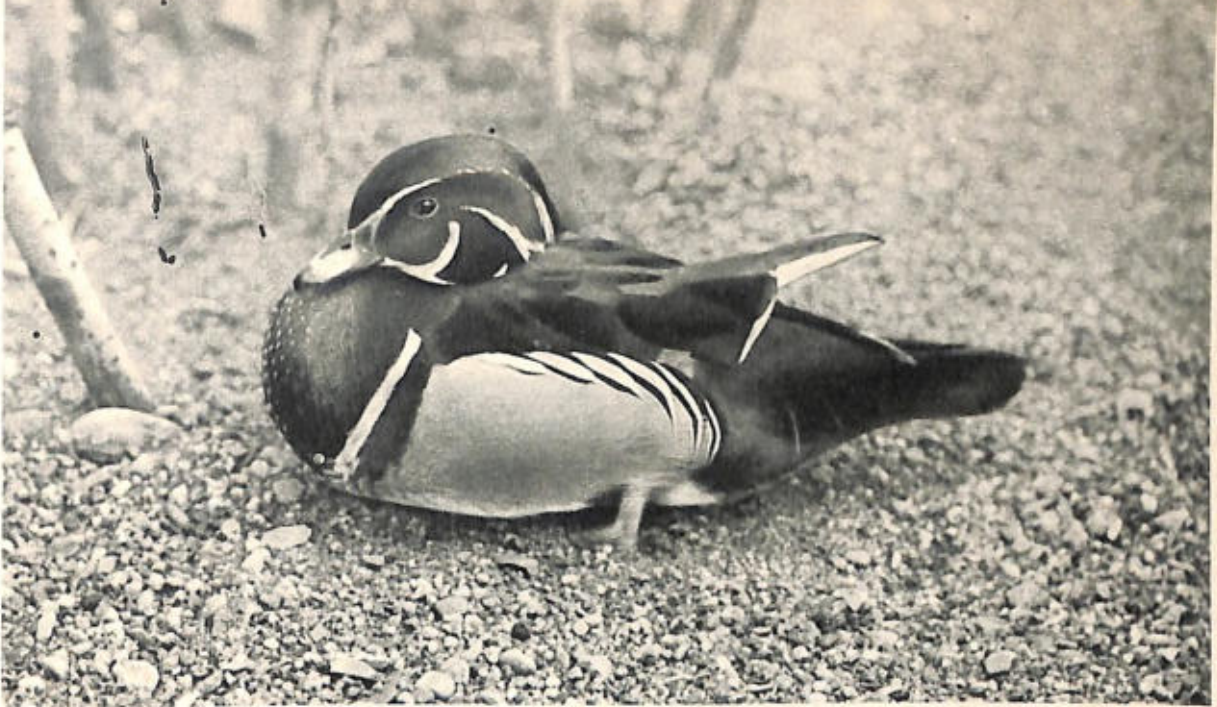
Perhaps the strangest of all the wading birds are the flamingoes. They have a remarkable appearance by virtue of their long, thin legs and long necks terminating in a small head. The beak of an adult bird is also of a curious shape — both halves look as though they were broken and bent sharply downwards. In actual fact, there is a very good purpose behind this, the strange beak serving as an excellent implement when the flamingo fishes in the mud. The flamingo fishes by submerging its head in the water so that the beak is horizontally placed with the bottom half on top. It then keeps scooping up the thin mud and sifting it with its rough-grained tongue, discharging the mud and retaining and crushing all the living creatures it thus picks up. These are chiefly crustaceans. Only four species of flamingoes are known to us; they inhabit flat, shallow areas of sea coasts, bays, the banks of salt lakes, river deltas and salt marshes in various parts of both the Old and the New World, as well as the islands near Australia and the Sunda Isles. The Rosy Flamingo — *Phoenicopterus ruber antiquorum* — lives also in South Europe, nesting in the south of Spain, in southern France, and in the Rhône river estuary. It is, however, more numerous around the Caspian Sea, in Iran, and farther east. Hundreds of thousands of flamingoes live on the banks of the large lakes of Central Africa, where they nest close to each other. They build nests about 1 ft. 6 in. high, resembling upturned flower pots with a shallow hollow on top. The nests are built of mud, sand and aquatic plants. The male and female take turns in hatching the single egg — occasionally there may be two. Young flamingoes lack the attractive pink colouring of their parents, and their beaks are at first straight like those of ducks.



Small exotic water fowl imported from far lands are often to be seen on the ponds of town parks and country estates. They are for the most part variously coloured ducks, some of them of incredibly bright and beautiful hues. The drakes in particular take on wonderful colours in the spring. The teal is the smallest known variety of duck. Two species live in Central Europe, both of them beautifully coloured. Even more gorgeous is the Japanese or Formosan Teal — *Anas formosa* — the drake of which displays fine hues of reddish and greenish colours in the spring. This beautiful bird lives in Siberia, but spends the winter in China, Japan and Formosa. When spring and nesting time are over, the birds moult and an astonishing transformation takes place, especially in the case of the male birds; the drakes lose all their bright colours so that they then hardly differ from their plain-coloured, nondescript hens.

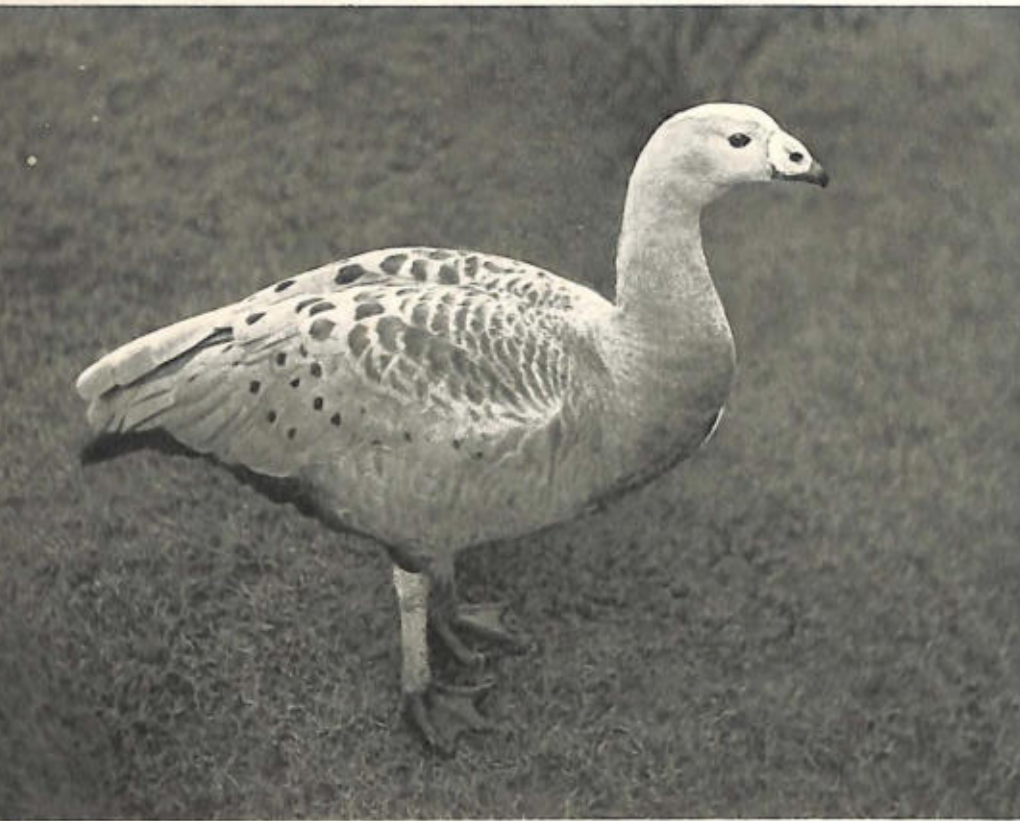


Some of these exotic ducks not only have attractive colours during nesting time, but also possess various adornments in the form of tufts, all kinds of appendages and vivid, glossy coloured areas in their feathers. The drake of the Mandarin Duck — *Dendronessa (Aix) galericulata*—looks, in his glorious spring dress guise, like some fantastic doll. The Mandarin Duck lives in East Siberia, Japan and China, making its nest in the hollows of old tree trunks overhanging the water, often as high as 30 ft. above the ground. This species excels in climbing—and the young birds, as soon as they are hatched, either jump or climb down from the nest on to the water.



No less beautifully coloured is the Wood Duck — *Aix sponsa* — also known as the Caroline Duck. The drake of this species also has a coloured tuft, even more variegated than the Mandarin Duck, on the top of its head. Its feathers are coloured pure white, black, and various dark, metallic hues of blue and green. These ducks enhance the look of many ponds and parks, where they may sometimes even nest. In the wild they are to be found in the temperate and warm parts of North America; there they nest in tree hollows, in open nests in the tree tops, and among rocks. They are fine swimmers and fliers and, though extremely wary, are courageous in face of danger. Like all other ducks, the Wood Duck, too, lives on water insects, worms, molluscs, fish and other water creatures, but it will also eat aquatic plants. In common with the other related species, it also discards its beautiful colours in summer, when it is hard to distinguish the drakes from the female ducks. With the approach of winter the drakes again become vividly coloured.





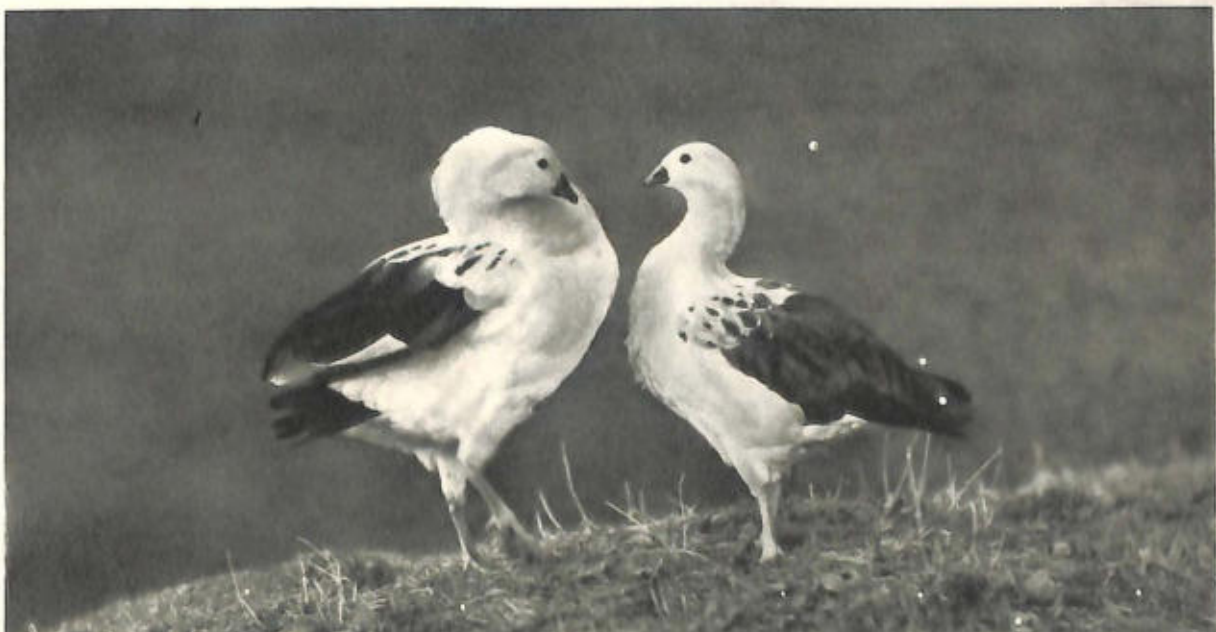
There exist many different species of wild geese, some of them very interesting because of their appearance, others because of their unusual habits. There is, for instance, the strange Cereopsis or Cape Barren Goose — *Cereopsis novae-hollandiae* — with its strikingly small head, short neck and exceptionally short beak. Its feathers are ashy grey in colour with brown spots. It is a very rare bird, living wild in South Australia, Tasmania and New Zealand. In contrast to the other species of wild geese, it prefers dry land to water.

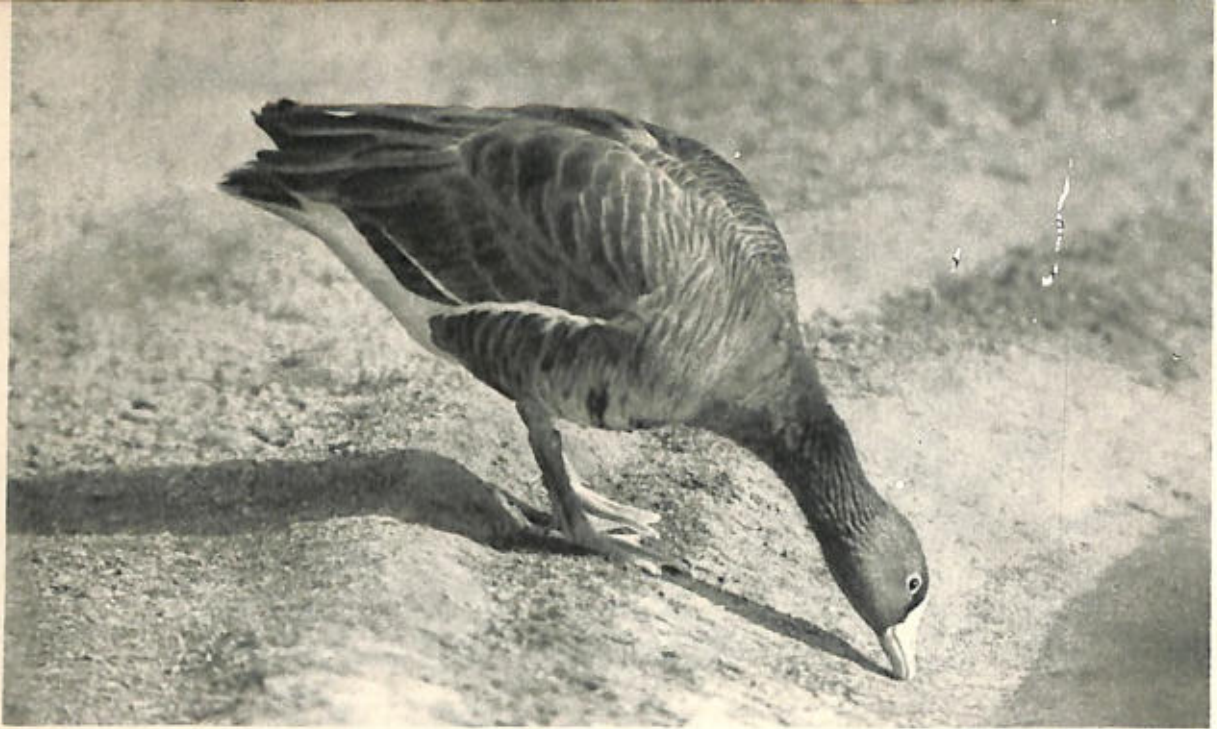
A similar, no less curious bird is the Ashy-headed Goose — *Chloephaga poliocephala* — which lives in South America. Like the preceding variety, it has a smallish head, short neck and small beak.



The Bar-headed Goose — *Anser indicus* — is a little smaller than our European wild goose, and is more vividly coloured. On its head the light grey feathers are ornamented with two horizontal black bands, while it has two light, vertical stripes on the darker coloured neck. This wild goose inhabits the steep cliffs overlooking the high mountain lakes of Tibet. Newly-hatched goslings fall down these sheer cliff sides on to the surface of the lake below, on whose banks they then grow up in large flocks. In autumn they leave Tibet to fly to India, spending the winter on the banks of large Indian rivers.

The high mountain lakes of South America are the home of yet another wild goose, the Andean Goose — *Andichenodes melanopterus*. Somewhat sturdier than our domestic goose, this species is coloured black and white, and has a very small head, a short beak and long legs. They live in pairs, each pair keeping constantly together, but towards other birds they are quarrelsome and intolerant, maintaining an incessant watch against all intruders whom they attack as soon as they come anywhere near their territory. These characteristics of theirs are particularly evident when they are kept in zoological gardens together with other birds. They are interesting and rare inmates of the zoo.





Some species of wild geese also live in European mountains. The Lesser White-fronted Goose — *Anser erythropus* — lives in the forested mountain areas of northern Scandinavia, in Finland, Sweden, and on the northern coast of Siberia. It is brownish-grey in colour, the older birds having black spots on the belly, linked up in a horizontal stripe. Above the beak it has a white spot like the larger and better known White-fronted Goose — *Anser albifrons*, from which, however, it differs by the fact that this spot extends as far as between the eyes, which are bordered by a yellow circle. This species migrates for the winter to the south of Europe and Asia.



The strange Spur-winged Goose — *Plectropterus gambensis* — inhabits central tropical Africa. The gander is almost the size of a swan, and has a prominent red protuberance over the beak, long legs and a relatively long tail. Its feathers are white, grey, brown and a glossy blackish-green. The sharp, forward-pointing spurs in the curves of the wing are a characteristic feature of this species. The Spur-winged Goose lives on the banks of large rivers where it hides in the swamps. Its diet consists predominantly of fish and other water creatures.

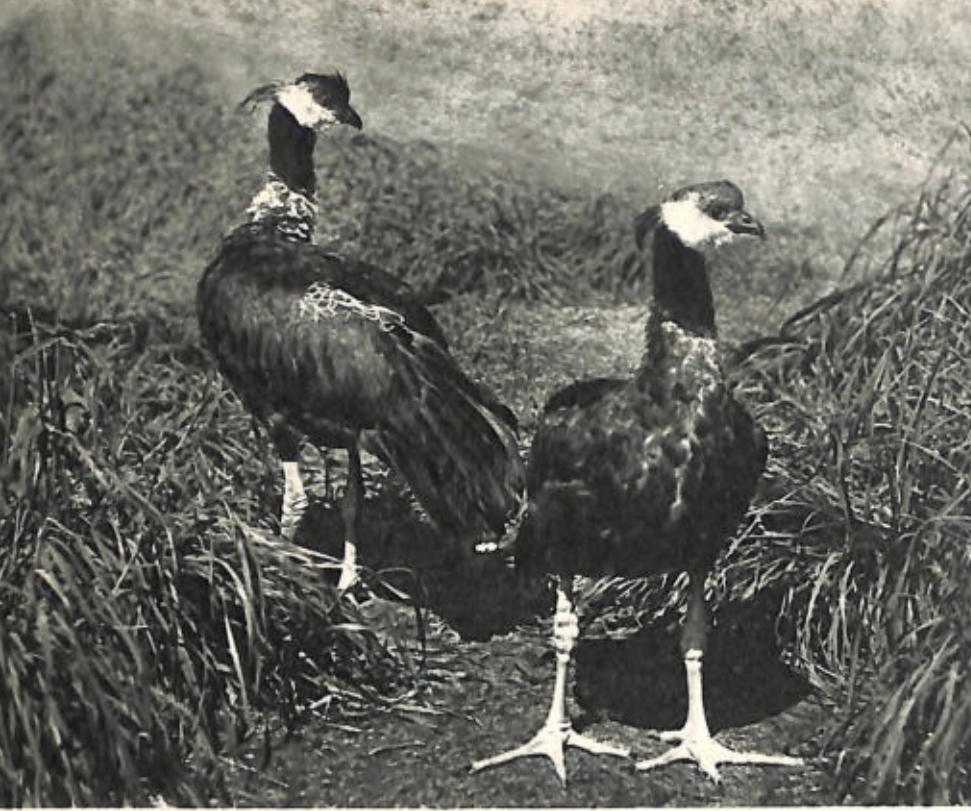


Swans are aquatic birds much larger than geese, with extremely long necks and graceful movements. They are particularly attractive when swimming in the water or flying in the air. Some nine species of swans live in various parts of the globe with the exception of the tropics. An exception is formed by one American species which also inhabits tropical regions. The largest is the Mute Swan — *Cygnus olor*. It is completely white, with a red beak and a black protuberance over it. It is a native of the northern parts of Europe and Asia, but will also be found in Poland and as far east as the Caspian Sea, living wild in reed-beds, preferably on lakes. In winter, when the lakes in the north are frozen, the swans often migrate south across Central Europe. Swans will quickly grow tame and are often kept in parks where they live on ponds and lakes. The nuptial games of swan pairs on the water are beautiful to watch.



A curious species of swan lives in Australia. It looks completely different from the other kinds of swans, being of a glossy greyish-black colour with bright red eyes and beak and a white tip to the beak. The underside of its wings is also white, but this will not be seen until the bird is in flight. Its feathers are wonderfully curled. It is called the Black Swan — *Chenopsis atrata*. Thousands of these trusting and intrepid birds used to live in the vicinity of lakes and rivers at the time of the colonisation of Australia. The barbaric extermination of tens and hundreds of the birds at a time, 'just for the fun of it', drove the Black Swan further into the interior, where it still nests, undisturbed, today. Its fate is now a far happier one — it has even been promoted to the position of heraldic symbol of Western Australia, and its picture appears on Australian postage stamps.





In the case of most bird species it is clear at first sight to which group of the zoological system they belong. The ducks, birds of prey, parrots and a number of others form well defined groups of whose mutual differentiation there exists not the slightest doubt. But there are a few species which continue to worry the zoologists, who find it difficult to decide how to classify them. In the days when many parts

of South America were still uncharted territory, travellers used to bring from there hitherto unknown animals, many of which came as a considerable surprise to natural scientists. Among these animals were also inconspicuous birds about the size of a turkey-hen. They lived in large flocks in the swamps, in reed-beds, and on the banks of tropical rivers. They were classified with the corncrakes and they have some characteristics in common with the ostriches, but more recently they have been placed in the order of geese — *Anseriformes* — despite the fact that they bear little resemblance to them. There are three species, forming the sub-order of *Palamedeae*, sometimes also called *Anhimiformes*. The Derbian Screamer (*Chaja*, *Anhupocca*) — *Chauna chavaria* — is one of these three species. The feathers of its body are grey, on its neck black, on the cheeks and under the beak white. At the bend of its wings it has, in front, two horny points which the bird uses as a weapon. The *Chaja* is an excellent flier. Its diet is mixed, i. e., it also feeds on small animals. It is known as a noisy animal, deriving its English name from its regular 'concerts' which can be heard for very long distances. The natives like to keep it with the other poultry in their yards and so it can be seen strutting about among the hens.



Here you can see a related species, the somewhat smaller Horned Screamer (*Aruco*, *Anhima*) — *Anhima cornuta* — which hails from equatorial America. It has a strange quill-like protuberance on its forehead and a way of life similar to the preceding species.



Just as the wild beasts in the case of quadrupeds, the birds of prey — *Falconiformes* — form a special order among the feathered fraternity. They are to be found almost everywhere in the world, everywhere, that is, where they can find the meat they need for their subsistence. The biggest bird of prey, and at the same time the biggest of the flying birds in general, is the Great Condor — *Vultur (Sarcorhamphus) gryphus*. It is the largest of six related species living on the American continent. It has a wing span of almost 9 ft. — the large males lack only about 10 in. to reach this length. Its feathers are a glossy blackish-brown, the tops of the pinions being creamy white. The Great Condor has a 'collar' of soft feathers, pure white in colour, around its neck. Its head and neck are completely bare, greyish-brown and in places reddish. The males have a stiff comb above the beak. These veritable 'lords of the air' sail high up above the mountain peaks of South America, in altitudes of 15,000 ft. and more. Their small red eyes deserve to be ranked with the greatest of nature's miracles — from that enormous height they see everything that goes on far down below on the ground. They fly over the snow-covered mountain tops looking for carrion, which is their chief food.





The life of the condors, in their inaccessible mountain haunts, was long shrouded in mystery and legend. It was only in the course of the last century that reliable observers have studied the condor's way of life, having spent some time in the lonely mountain spots where these birds live. It is also not without interest to observe the condors in the zoo; in spring the condor spreads his mighty wings in the sun, whose direct rays he evidently needs. If a pair of condors is brought together and given sufficient space and quiet for nesting purposes, it is possible in the spring to watch their nuptial games. The male stands opposite the female bird, spreads his wings, bends his head and swells his throat, at the same time stepping from one foot to the other and emitting a hoarse drumming noise, while trembling all over.





When I was working in a zoo, I observed the successful nesting of condors — a rare event in the case of this bird when in captivity. Already by the middle of March the pair had cleaned a hollow in the earth among some rocks. The two birds then frequently sat on this simple nest until, two days before the end of March, a white, elliptical egg, $4\frac{1}{2}$ in. \times $2\frac{1}{2}$ in. in size, appeared there. It weighed $\frac{1}{2}$ lb. From then on the two condors either sat on it side by side, or took turns, at the same time preventing anyone from approaching the nest. On the last day in May — i. e., after sixty-five days — we discovered that there was a young condor under the female bird. It was about the size of a large young pigeon and had a bare, blackish-coloured head and light grey, fluffy feathers. The young condor lay underneath the parents, who kept it constantly warm. Only after three days did we see them feed it. At this time the condors refused to allow even their familiar keeper to come near the nest, protecting the young bird with wings spread out in a challenging posture. The feeding and training of the young condor fell almost entirely to the male bird.



Early in August the young condor began to stand on its own legs, standing at first only on the heels and in the following days venturing more and more often to the edge of the nest. Both parents were at hand to prevent it from rolling down from the nest. At the end of the month it was at last able to clamber clumsily on its own down the steps cut in the rock and tried to peck at the meat that was provided for it. It presented an extraordinarily comic appearance. Our picture shows the young condor at the beginning of September, when it was three months old and was already going out to feed on its own. The feathers on the relatively long legs made it look as though it were clad in trousers. The young bird was completely covered with a fine, reddish-grey fluff and the first quills were just beginning to appear on its wings. A few days after birth it already had a discernible comb above the beak — the sign of a future male condor.



The most beautiful of the other species of condors is the King Condor — *Gypagus papa*. This bird of prey, having a wing span of about 6 ft., is considerably smaller than the Great Condor, but it has such marvellously coloured feathers that it is often called 'king of the condors'. The light feathers of the body are white, slightly reddish, the dark feathers are black, bordered with grey. The head, neck and beak look as though they were painted by an artist in red, yellow and orange, while the iris of the eye is a pearly white. The adult bird has, above its beak, a whole bunch of vividly red wart-like protuberances which take the place of the comb possessed by the Great Condor. The beautiful King Condor inhabits tropical America, but does not live in the mountains, its habitat being the virgin forests in the lowlands. It nests in the trees and lives in not too large flocks. Hovering high in the air it is ever on the look-out for carrion or the remains of a jaguar's supper. It will become quite tame in captivity and will show great devotion towards its keeper.



The head of a King Condor.



Several species of vultures, much smaller than the condors, live in America. They mostly have black feathers and a small, bare head of various colours. The head of the South American Turkey-Vulture — *Cathartes aura* — is red in the front and bluish at the back. In front of the eye it has a dark spot. It is one of the smaller vultures which act as 'sanitary inspectors' in villages and small towns, moving about fearlessly among people in the markets and in the vicinity of slaughter-houses, where it clears away all remnants of meat and entrails. These vultures also stand by and watch for refuse when they see fishermen working on the shore. They nest either on the ground or in the trees and rocks.

The small Egyptian Vulture — *Neophron percnopterus* — leads a similar life in the whole of Africa, in South Europe, and throughout the warmer parts of Asia. When fully grown, its feathers are predominantly light yellowish-white in colour, only the pinions being black. Our picture shows a young Egyptian Vulture, of a dark brownish-grey hue. The striking collar formed by longer feathers around the neck is white in the case of adult birds. The ancient Egyptians and some other eastern peoples used to protect these birds and to worship them. They depicted them as symbols of the virtues and respected them for their function in nature. The Egyptian Vulture eats small live animals as well as carrion, and will sometimes even catch insects.





The large Black Vulture — *Aegypius monachus* — lives in South and East Europe and in South Asia. It is only a little smaller than the condor, its wing span measuring about 7 ft. 6 in. It has an exceptionally strong beak and around its bald head a wide, projecting collar of brown feathers. Like the eagle, this bird circles high up in the air and searches for carrion. Although their food gives off a very strong odour, vultures use their sight and not their smell in looking for it, since their sense of smell is very poor, as indeed is that of all other birds. They also watch other vultures to see where they alight to feed. If carrion is scarce, they will be content with small live animals. This species nests in the trees and has a single young at a time. In captivity it can endure even winter in cooler climates, as long as it has a roof over its head and, above all, adequate food. In the wild as well as in captivity vultures may live up to a hundred years.



Three species of the big Griffon Vulture — *Gyps fulvus* — live in Africa, in the countries around the Mediterranean Sea, and throughout South Asia. It usually has light brown feathers with black pinions and tail feathers. The whitish neck stands out above the collar of fluffy feathers. The head is covered only with short, whitish down. These vultures make their homes chiefly on top of low rocks where they have a good view of the surrounding countryside. They circle in the air in small flocks and, like all vultures, search for carrion which, of course, is increasingly difficult to find as civilisation advances. A great deal has been written about the 'repulsive feasts' of these 'ugly' birds, the authors heaping abuse upon the eternally hungry vultures. Even many natural scientists are in the habit of speaking of them with contempt simply because these birds eat that which is repulsive to human beings. The truth, however, is that they are highly useful in the open and in the backward towns of the Orient, not killing anything for their sustenance, doing no one any harm, and quickly and reliably removing carrion that would in the hot climate become the source of an offensive smell and of dangerous infections. The members of some Indian castes have since time immemorial made use of this hygienic function of the vultures, placing the earthly remains of their dead on the well known 'silent towers' to be disposed of by the vultures. Certain kinds of vultures feed exclusively on human excrement.



The south of Europe, East Africa, and especially the entire warmer zone of Asia are the home of the Bearded Vulture — *Gypaetus barbatus*. It is about 3 ft. long, its wing span sometimes attaining over 7 ft. 6 in. Its feathers are very intricately coloured as every feather is of a different colour in the middle and at the ends. Generally it can be said that it has brownish or blackish wings, and a reddish-yellow head and underside of the body, this colour being very light in the case of the older birds. Across the eyes the Bearded Vulture has black markings resembling a mask. Around the powerful beak it has stiff, forward pointing bristles, linked underneath the beak in a thick brush, which makes the bird look as though it had a beard. Its eyes are pearly white, circled with a vivid red.



The head of a Bearded Vulture.



The birds of prey — *Falconiformes* — include some 205 species. If we are to examine at least some of the more important ones, we must not forget that fine American bird of prey, the Chilean Eagle — *Geranoaetus melanoleucus*. It belongs to the sub-family of buzzards — *Buteoninae* — but is much sturdier than the buzzard, inhabiting mainly the west coast of South America. The top of its body, the head and the neck are a slate grey in colour; its pinions are likewise dark, almost black, with horizontal grey stripes. Its throat, the underside of its body and the wings are a light grey with thin horizontal blackish-grey wave lines. The Chilean Eagle feeds mainly on fish and the young of birds living on the coast.



The sub-family of carrion hawks — *Polyborinae* — includes the Cheriway Carrion Hawk — *Polyborus cheriway*. It lives chiefly in the northern parts of South America and in Central America. It is a brown bird the size of a hawk, but it has long legs and a very powerful light-coloured beak with yellow markings around it. A pair of these birds kept in captivity will leave no one in the neighbourhood in any doubt of their presence: they will stand around by the rock on which they are nesting, lean their heads well back on their necks and utter loud, piercing cries that can be heard for miles. Even in captivity the Cheriway Carrion Hawks will often have young. This species has dark brown feathers on top of the head, on the body and at the end of the tail: the neck, the sides of the head and the lighter stripe in the tails are a dirty ochre colour with brown wavy lines, while there is yellow on the legs and around the beak.

Also included among the birds of prey is a very curious genus and species, quite different from all the others. This is the snake-catching Secretary Bird — *Sagittarius serpentarius* — a bird about 3 ft. tall, with exceptionally long legs and a striking thin fan of longer quills at the back of its head. These feathers have provided the bird with its name, since it resembles medieval scribes who used to wear their quills stuck behind their ear. Thanks to its light greyish-brown, black and white colouring, the Secretary Bird is otherwise fairly inconspicuous in the desert, veldt and open lowlands in which it lives. With deliberate steps it carefully approaches various rodents catches fledglings and loots bird's nests on the ground, eats all larger insects, and hunts amphibians and reptiles, including poisonous snakes. It is not afraid even of those serpents which can lift themselves erect when defending themselves against attack. The Secretary Bird engages in long duels with them which are extremely thrilling to watch; it keeps manoeuvring for position, dodging and hopping about, wards off its foe by extending its wings which act as shields, and by its persevering tactics invariably defeats the exhausted snake, killing it by judicious strokes of its claws and beak. The Secretary Bird lives almost everywhere in Africa with the exception of the Sahara and the most northerly regions. They live in pairs, each pair having a precisely defined area, and nesting in bushes and low trees. In some parts they can be found tame, walking about among the poultry and substituting for the cat in hunting various pests.





The *Galliformes* are an attractive bird group which include, among others, the beautifully coloured birds of the *Galli* genus, which are also frequently conspicuous by their shape and appearance. Their heads are usually decorated with various combs and similar adornments, often vividly coloured, while their feathers have a glossy, metallic lustre. Here is a representative of this order, the Vulturine Guinea Fowl — *Acryllium vulturinum*. It is about 1 ft. 6 in. high, its feathers being white, grey and a beautiful ultramarine blue. Over twenty species of guinea fowl live in tropical Africa and Madagascar, among them also the Common Guinea Fowl, which has been domesticated in Europe and which has reverted to the wild state in Central America. In eastern tropical Africa the Vulturine Guinea Fowl lives in coveys like our partridges or pheasants, among bushes, rocks and grassy steppe. It feeds on insects, berries, seeds, buds and grass. It nests in a hollow on the ground like our poultry.



A very beautiful bird living in the south-west part of North America is the Californian Quail — *Lophortyx californica*. It belongs to the sub-family of quail, small American poultry not even as large as the partridge. Quail have the lower half of the beak full of small teeth very much like a little saw, and are as a rule of attractive colours. They nest on the ground, but are also in the habit of sitting on top of bushes and in the trees where, especially when young, they take refuge before any danger that threatens them down below. The Californian Quail is coloured brown, ash-grey, black, straw yellow and white. It is easily recognised by its grotesque tuft, especially striking in the case of the males, which is formed by several black feathers broadened out at the end and dashingly cocked forward.



Central and South America is the home of about forty species of birds belonging to the *Cracidae* family, usually a little bigger than a domestic cock and having short, rounded wings, a long, curled tail, and a short, bent beak. Their colouring is usually dark. Some species have all sort of feathery tufts or protuberances on their heads which look as though they were artificially arranged; the feathers bend backwards but at the tip they turn forward as if they had been waved with a hot iron. The Urumutum or Nocturnal Curassow — *Nothocrax urumutum* — from northern Guiana is a typical member of this family. Its feathers are a glossy black, while the bare patches on its head are a vivid red. These birds live exclusively in the forests and tropical jungles where they hop from tree to tree, only seldom coming down to earth. Their diet consists mostly of fruits. They will only walk on the ground in places where low-hanging branches or other vegetation affords them protection. Like our cocks, the curassows herald the dawn, each species with a different voice. They live in small groups and only at nesting time in pairs, building flat nests in the trees and not on the ground as do the other birds of this order.

Now let us take a look at the short-winged *Ralliformes* order, beginning with a few species belonging to the *Grues* sub-order. This includes some twenty species of birds known as cranes. They rather resemble the storks, have a relatively small head, a rounded body and long legs. Excellent fliers, they usually fly in wedge formation, and they are both clever and cautious. The Demoiselle Crane — *Anthropoides virgo* — is a native of South Europe, Central and South Asia and North Africa. It is comparatively small — less than 3 ft. tall. Its head is completely covered with black feathers. The neck is also black, the rest of the body mostly a light ash-grey. Behind its scarlet coloured eyes the adult bird has a tuft of white, downward bent feathers. Demoiselle Cranes live in flocks on steppes and marshes, feeding on locusts and other insects, worms, molluscs and small vertebrates. They also like vegetable food, in particular grass and papilionaceous plants. They make their nests on the ground, in cultivated areas frequently in the fields. In captivity they are extremely good-natured and calm.

The largest of the cranes is the Eastern Sarus Crane — *Antigone antigone* — which may grow to more than 3 ft. Its feathers are coloured greyish-brown, the bald spots on the head are red. This sturdy bird lives in South East Asia, its mode of life being similar to that of the European varieties of cranes. The nuptial dances of these cranes are an interesting sight which may be seen even in the zoo if the birds have a sufficiently large open-air run. Both the male and the female spread their wings, lift their heads and advance towards each other, jumping up into the air all the time.

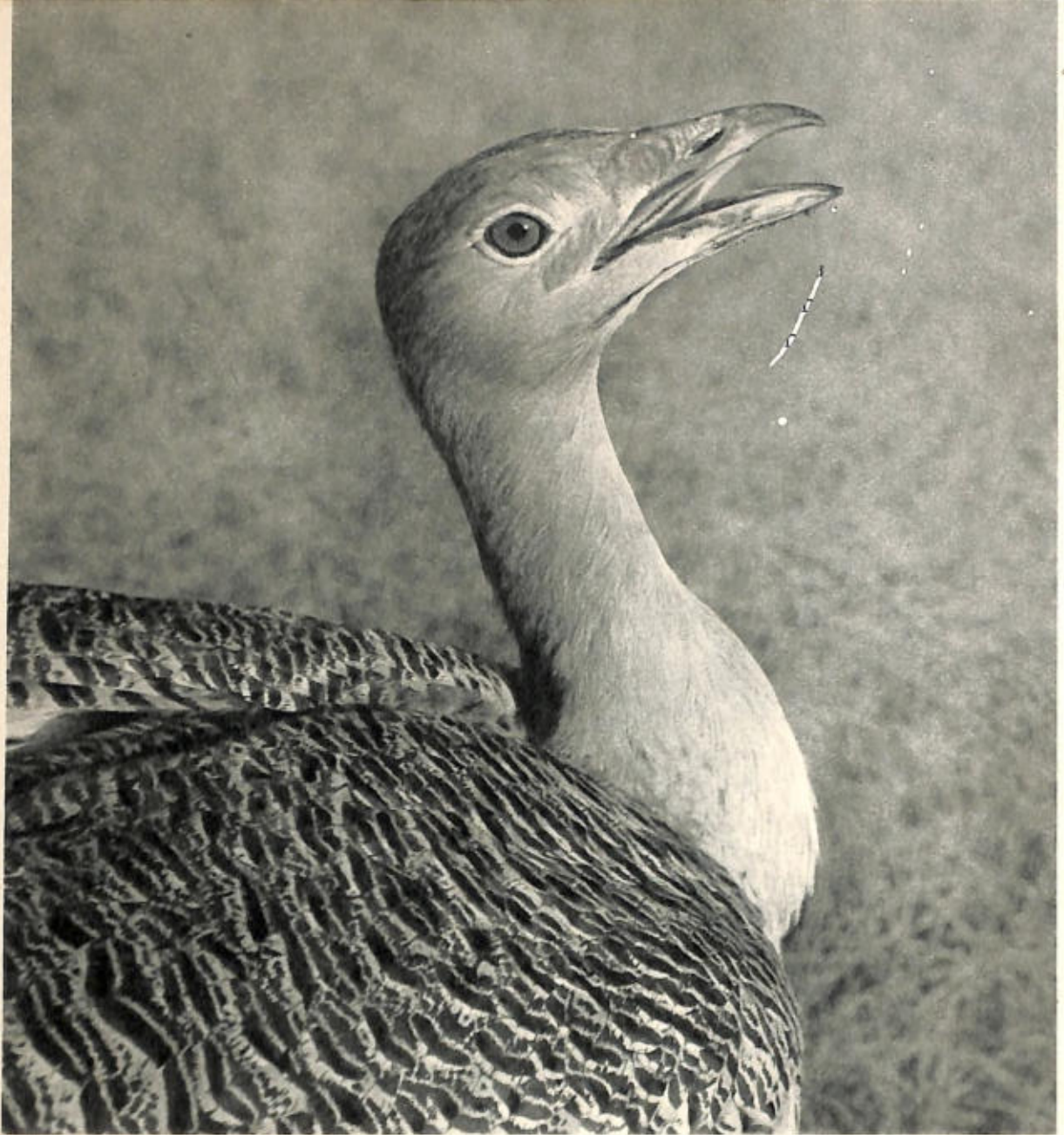




The appearance of certain birds makes us wonder at the grotesque and apparently pointless shapes with which nature has endowed them. The adornments some of them possess evidently serve no logical purpose and it seems to us as though nature had overdone things just for the fun of it, without any good reason. In the case of the Secretary Bird we may perhaps argue that the crown of feathers on its head has developed in the course of the centuries as a tactical device intended to confuse the poor-sighted, dull-witted snakes which are the bird's chief prey and which, when fighting it, must often strike with their poisoned fangs at these feathers instead of the head itself. Where the Black-necked Crane (or West African Crowned Crane) is concerned, it is only possible to surmise that the strange crown of stiff, wavy feathers on its head, possessed by both the males and females, is the result of the bird's constant hopping and skipping, this species of cranes being addicted to regular and frequent 'dances'. The Black-necked Crane — *Balearica pavonia* — is slightly larger than the stork. Its feathers are greyish-brown, white, black and blackish-brown in colour. The bare cheek areas are reddish and the crown on its head straw-coloured. They live in pairs or large groups near Central African rivers and lakes. There, on the sandy banks, they indulge in their curious dances, flapping their wings and hopping from one leg to the other. They can jump as high as 3 ft. into the air. In captivity, too, they will frequently perform these dances. Like the other species, they feed on grain and seeds, plants, insects and some small animals. They are very adept at flying, waving their wings steadily and in a leisurely fashion, stretching their necks straight out and bending the crown of feathers on their head backwards.



The head of a Black-necked Crane.



The sub-order of bustards — *Otides* — consists of some thirty species of medium-sized and large birds which live in the arid regions of the warm and temperate zones of every continent, with the sole exception of America and the Antarctic. In the deserts of the Central and South Asian plains and in some countries of Central and South Europe lives, in the wild state, a sturdy and beautiful bird called the Great Bustard — *Otis tarda*. It is far stronger than the turkey — the old males are up to 3 ft. long and may weigh as much as 33 lbs. Their head and neck are light grey, the feathers on the upper side of the body a copper brownish-red decorated with horizontal black stripes. The underside of the body is white. Old cocks have tufts of bristly feathers sticking out at the sides of the face, giving them a whiskered appearance. Both our pictures show adult but not quite fully-grown cocks which we have included despite the fact that this book is primarily devoted to the more



exotic birds. They are today so rare that in many European countries they are already considered to be exotic. They live in small groups (in Central Asia the groups are larger) and are extremely wary, so that it is difficult to come near them. The males are polygamous, and in early spring the older ones perform nuptial dances similar to those of the ostriches and cranes. With the younger birds this takes the form of a partial ruffling of the feathers, lifting of the head, swelling of the throat, and a haughty, deliberate gait. Bustards feed on the leaves and seeds of all kinds of plants; in summer they catch and collect insects and hunt small vertebrates such as mice, reptiles, young birds, etc. Young bustards live almost exclusively on insects. They nest on the ground and usually have two young at a time. They fly quite well, and in winter migrate from the more northerly lands to the warmer countries of the south.



The interesting sub-order of *Cariamae* is today also included in the *Galliformes* order. They are South American birds, grey in colour and about as large as a turkey-hen, though considerably thinner. They have long legs, and both zoologists and palaeontologists agree that they are related to the cranes and corncrakes, considering them to be the descendants of the extinct non-flying giant birds which lived some fifty million years ago and whose bones have been excavated on the American continent. They had stunted wings, strong legs and a head the size of a horse's head with a powerful predatory beak. There were several species, differing in size; in South America lived the 9 ft. large *Phororhacos*, while the smaller (about 6 ft.) *Diatryma* had its home in North America. Two species showing signs of descent from these giants still exist today: the Seriema, also called Brazilian or Crested Cariama —

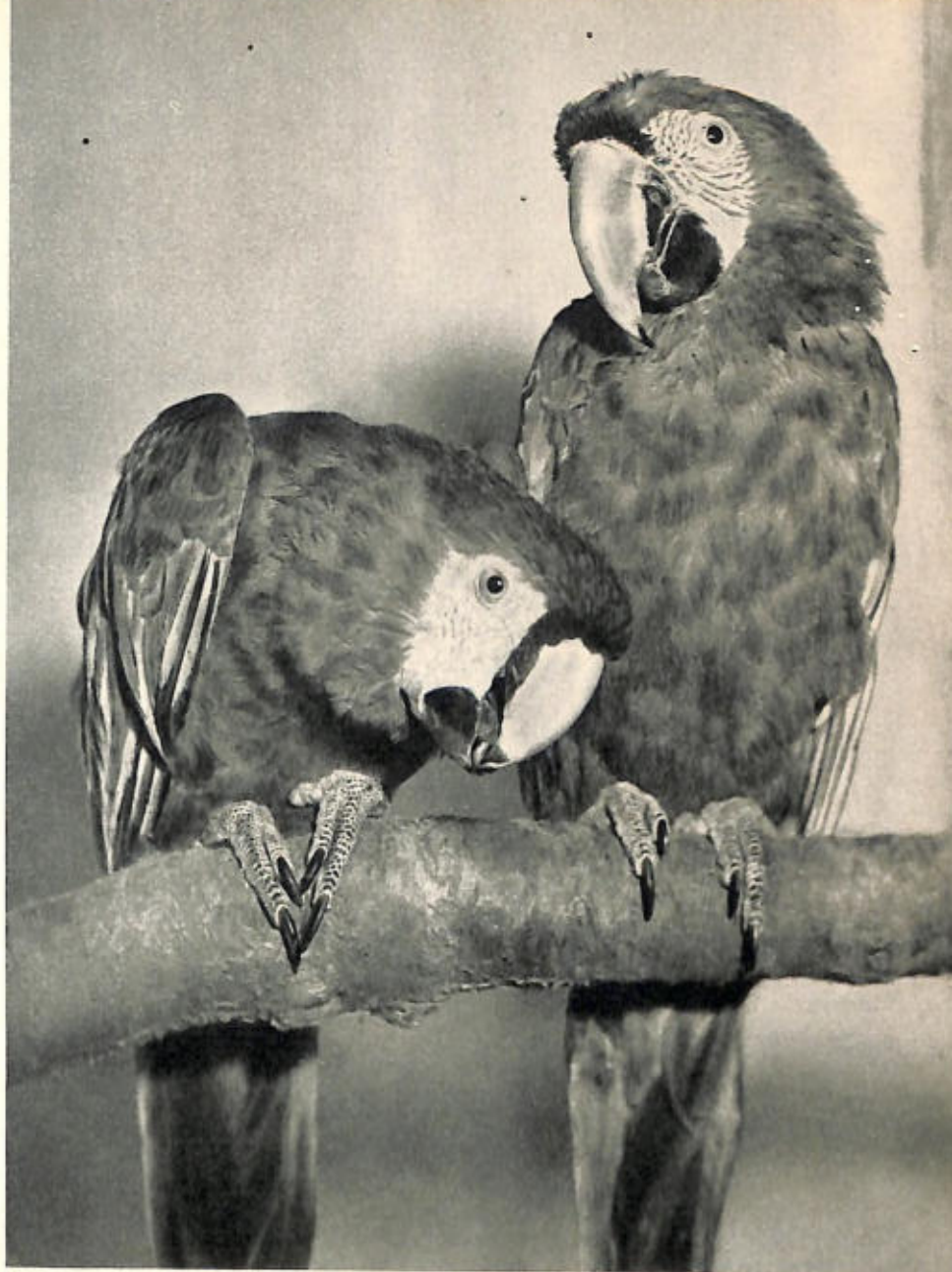


Cariama cristata (shown on p. 58) — with its red beak and a crest on the forehead, and the smaller Burmeister's Cariama — *Chunga burmeisteri* (p. 59) — which has a black beak and no crest. Both these species live in the tropical parts of South America, inhabiting the grassy plains with slight vegetation. They are exceedingly shy, particularly those which live in the open pampas. They are consequently very adept at concealing themselves and, if pursued, are extremely fast runners. They fly up into the trees, where they nest and from where they scan the surrounding countryside. They live on the larger insects, snakes, lizards, and other small animals. People often tame them and keep them as domestic birds, but they are not really suitable for this purpose as they emit harsh, almost deafening cries, frequently without any apparent cause.



The astonishing number of exotic birds which exist in the world makes the task of choosing the most interesting out of every group an extremely difficult one. There are, for instance, some three hundred species of the pigeons alone. One of the largest of these is the Crowned Pigeon — *Goura coronata* — a bird almost the size of a turkey-hen. It is usually to be found on the ground, where it picks seeds and berries falling off the trees. Its feathers are a purplish greyish-blue. It has a curious flat crest composed of fine feathers which by their shape resemble fern leaves. The delicate beauty of this 'crown' is apparent only from a side view. The Crowned Pigeon is one of about eight species living in the coastal forests of New Guinea and some of the neighbouring islands. Most of these tropical pigeons have beautiful colours.

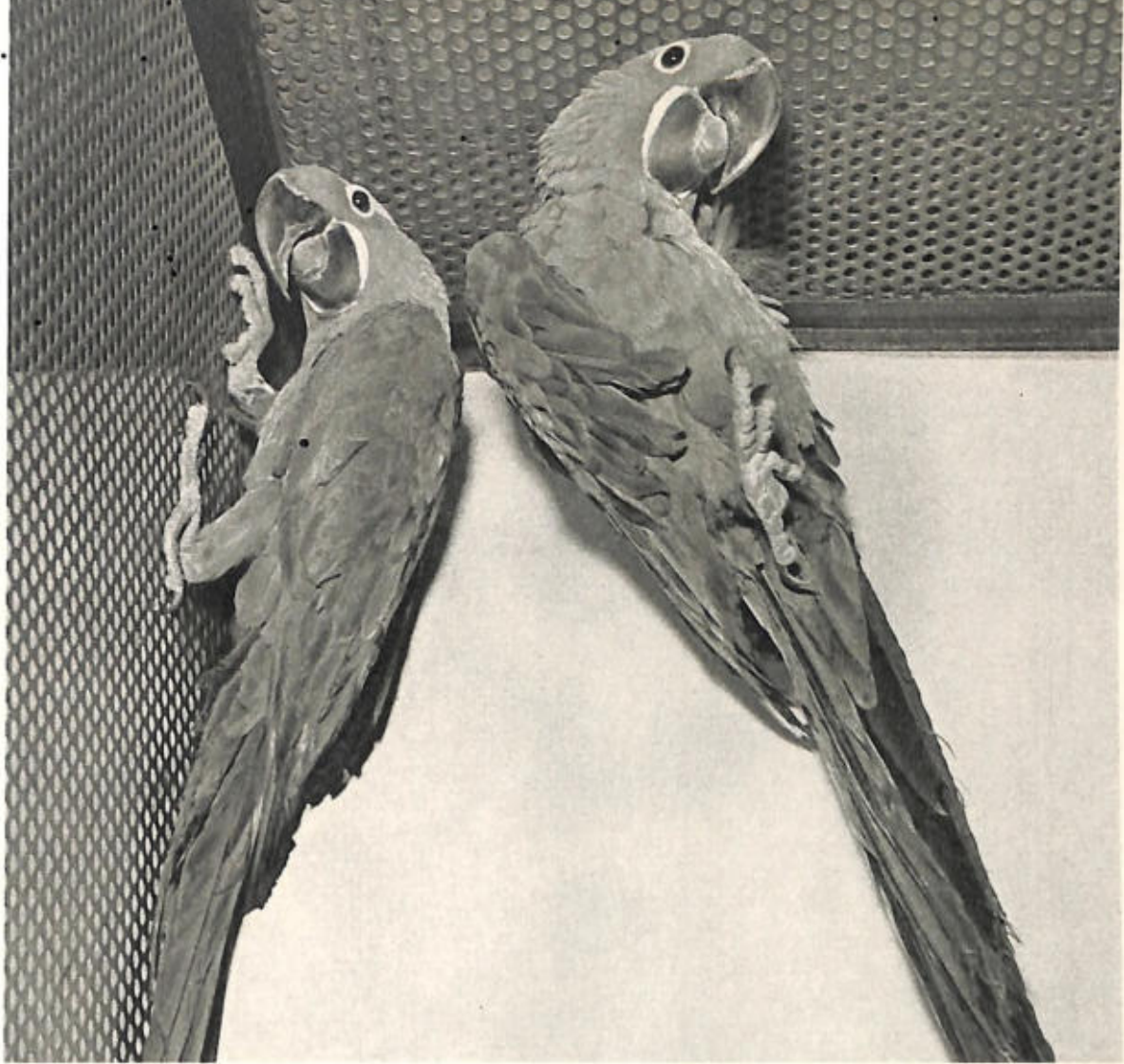
And now we come to the most interesting birds of all. These certainly include the parrots with their grotesque heads and big, sharply bent beaks, and their exceptionally vivid colours which are unrivalled in the whole bird kingdom. Hardly anyone who sees a parrot for the first time can fail to be astonished by and enthusiastic about its splendid colouring. Those lucky enough to see the pink, red, yellow, purple or blue flocks flying about in the tops of tropical trees will not forget this splendid sight for the rest of their lives. A shrill-voiced flock of green parrots



disappears in a wall of bright, fresh leaves and completely merges with it. On this and the following pages you will find some of the 600 species of parrots, mostly very brightly coloured. The Macaws, of which there are about twenty different species, belong to the largest parrots. The Red-and-blue Macaw — *Ara macao* — and the Red-and-yellow Macaw — *Ara chloroptera* — look very much alike; both are scarlet in colour and have long feathers in a wedge-shaped tail. The Red-and-blue Macaw pictured on the right is somewhat lighter and has blue and yellow wings and naked, flesh-coloured cheeks completely devoid of feathers, while the other kind is of a darker red and has yellow feathers in its wings. Its cheeks are white and, though also bare, have sparse single red feathers growing on them in rows. These macaws grow to a size of almost 2 ft. 6 in., both species having their home in the forests of tropical America.



The Blue-and-yellow Macaw — *Ara ararauna* — is roughly of the same size as the previous two species, sometimes even slightly larger. Its feathers are a beautiful light blue with a greenish sheen. The underside of its wings and its head are orange-yellow, its cheeks are naked and whitish with rows of black feathers, lined at the bottom with a black-brown stripe. The Blue-and-yellow Macaw lives in the tropical parts of America. Like all the macaws, it feeds on the fruits of tropical trees, seeds and nuts which it deftly cracks with its large and powerful beak. The macaws nest in tree hollows and have two young at a time. They live in pairs or in small companies composed of whole families. Occasionally they will form large flocks. Almost all parrots are capable of imitating the sounds that they hear and therefore also of imitating human speech. The macaws are no exception — they learn to reproduce words and entire sentences. For the most part, however, they emit loud and unpleasant screeching noises, for which reason it is not advisable to keep them in confined spaces. Young macaws, taken early from their nest, will become quite tame, so that they may be left to fly freely around the house without any danger of their flying away. The natives know in which trees to find the nests and regularly take out the young parrots, which they sell to foreigners. They also like to eat the flesh of newly-hatched parrots.



Parrots have prehensile claws with four toes, two of which are turned forward and two backward. Slowly but with complete assurance they clamber from branch to branch, mostly holding on also with their beaks. Their legs are so powerful that they will often hang by one leg only. If shot, parrots remain clinging to the branch by their beaks for some time before dropping to the ground. They can even take apart the wire netting of their cages with their beaks — that is why their cages in the zoos are generally of perforated tin plate.

The lovely Hyacinthine Macaw — *Ara (Anodorhynchus) hyacinthinus* — comes from central Brazil. It has cheeks almost completely covered with feathers, only a narrow strip at the bottom of its lower jaw remaining bare. This species has a beak so amply proportioned that it forms half of the whole head. Its feathers are a dull blue, cobalt hue. The tail and wings are darker, some of the feathers in them being black and glossy. The bare places around the eyes and beak are orange in colour. This species of parrot is as much as 3 ft. long and is one of the rarest and most expensive inmates of the zoo aviary.



Some species of parrots have an adornment on their heads in the shape of a crest formed by longer feathers growing on the forehead and on the top of the head. According to the bird's mood, the crest is raised, ruffled or again laid flat along its neck so that it is sometimes indiscernible. Most of these crested parrots are called Cockatoos — *Cacatuinae*. The best known of the cockatoos is the Lesser Sulphur-crested Cockatoo — *Lophochroa sulphurea* — a white bird the size of a pigeon, with a yellow spot on each side of the head. There are yellowish feathers in its wings and tail. Its brown eye is encircled with a bare white ring. The crest is composed of white feathers in the front with sulphur yellow ones behind; when the cockatoo spreads its crest, the feathers fan out like the bloom of a yellow chrysanthemum. This kind lives on the island of Celebes and some of the smaller islands near it. In captivity it is a friendly, companionable bird which will frequently learn to repeat words.



The Greater White-crested Cockatoo — *Cacatua alba* — is almost 1 ft. 6 in. long, completely white with yellowish feathers on the underside of its tail and wings only. It has a white crest composed of a row of wide feathers placed one behind the other. At the ends the feathers are widened and can be folded flat, one on top of the other, so that if the bird is standing still the crest will not be seen. When raised, the crest is very large and looks rather like a Red Indian's head-dress. This species of cockatoo lives in the Molucca Islands.



One of the most beautiful of the cockatoos is the Leadbeater's (Pink) Cockatoo — *Lophochroa leadbeateri*. It may be as large as 15 in. but usually it is smaller than this. Its colouring is a pale pink, the back of the body and the top of the tail being white. The feathers above the root of the beak, under the tail and beneath the wings are a vivid pink. The front and side feathers of its crest are pure white, so that the crest looks white as long as it is laid back on the bird's neck. When raised, however, it produces a sudden beautiful colour effect which ranks with the loveliest to be seen on any living creature; at the ends the crest feathers are white, inside they are a vivid orange red with a yellow spot in the middle. The Leadbeater's Cockatoo lives in large flocks in South East Australia, chiefly in gum-tree forests. It nests in hollow trees.

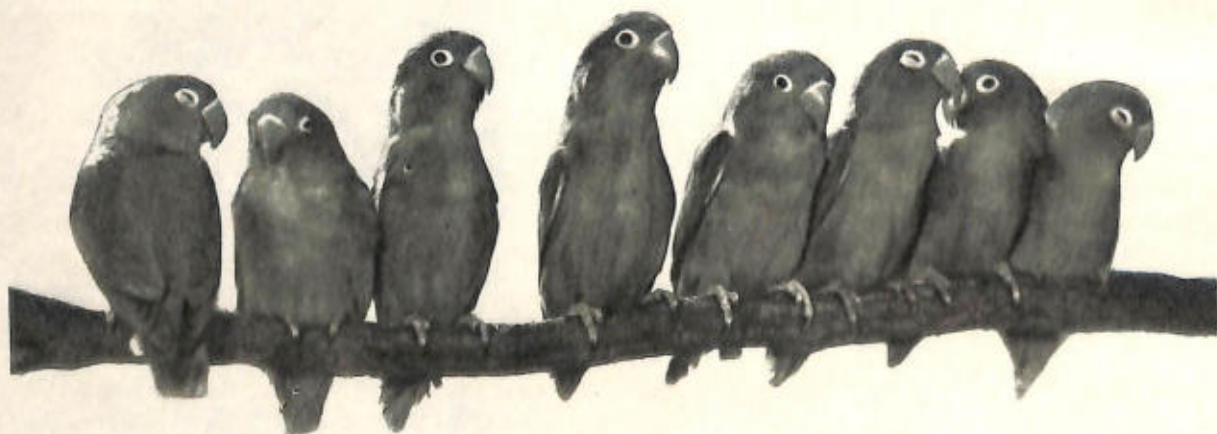
Another well-known species is the Grey Parrot — *Psittacus erithacus*. A little larger than a pigeon, it has feathers of a slate grey colour, lighter on the head. The tail feathers are a lovely red and are short, as though carefully cut. Adult birds have light yellow eyes. This parrot lives in equatorial West Africa in forests on the banks of large rivers. It also nests in the hollows of big forest trees and, as opposed to the majority of other parrots which as a rule lay only 2 eggs, it will have as many as 5. It is a very talented and docile bird which used to be imported to Europe a great deal.

About fifty species, similar in size to the Grey Parrot but green in colour, inhabit tropical America. They belong to the *Amazona* genus, usually being green or blue on top and yellowish on the underside of the body. Their wing feathers are beautifully ornamented in scarlet or yellow, these colours however only becoming visible in flight or when the sitting bird spreads its wings. Its diet is similar to that of the other parrots: fruit, seeds and kernels. In captivity these birds are given millet, rice in the husk, sunflower seeds and maize grains, preferably soaked. They like unripe, soft maize stalks and various green leaves such as lettuce, spinach, twigs and buds. They also like nuts, biscuits and soaked crackers. They must always have fresh water to drink. These parrots are good, friendly pets and as often as not learn to speak very nicely, being consequently highly popular with breeders. Much depends on the way a parrot is trained and brought up — incorrect training can turn it into an ill-natured, malicious bird, given to screeching and biting and becoming troublesome to all who come into contact with it. It is then hard to wean it away from its bad habits. This genus is most frequently represented in captivity by the Blue-fronted Parrot — *Amazona aestiva*.



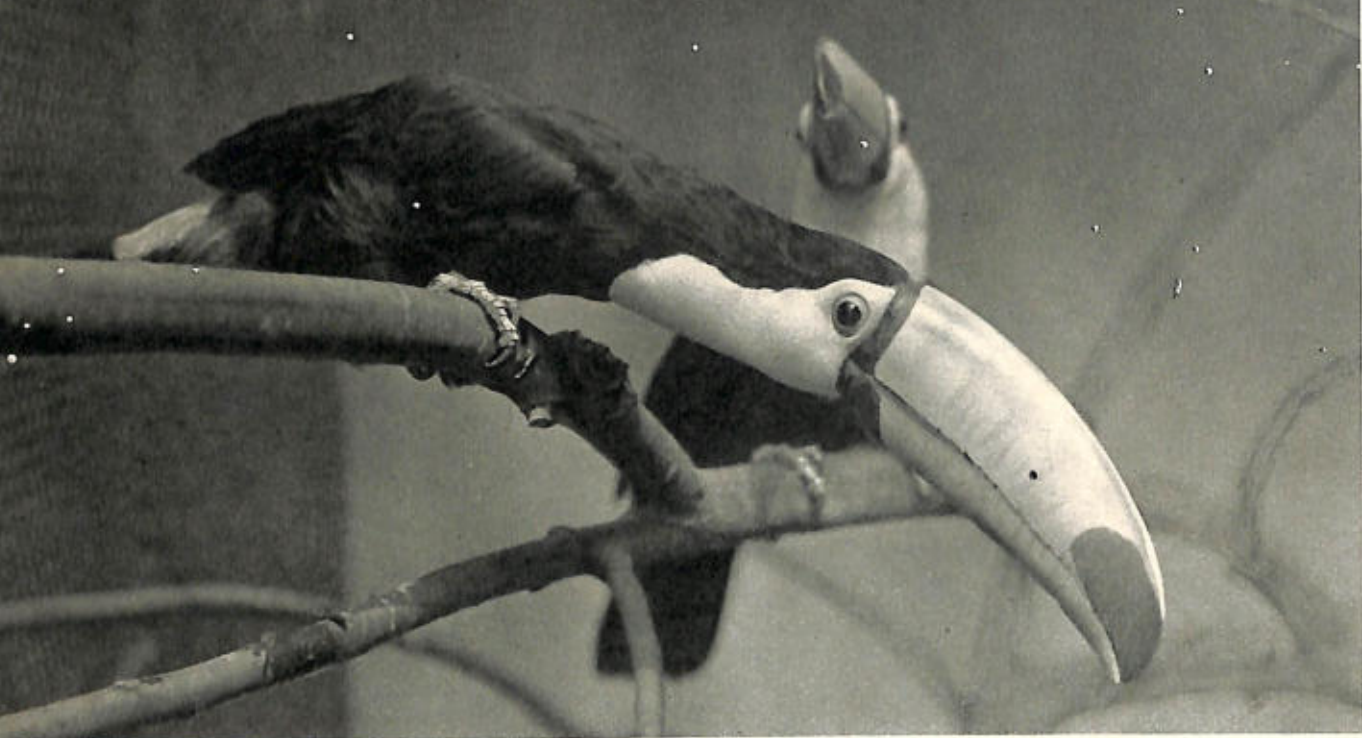
In the aviaries of breeders of exotic birds, in zoological gardens and at exhibitions of live exotic birds we occasionally come across charming little parrots the size of strong sparrows. They have coral red beaks, orange heads, green bodies and bluish wings. They cuddle close together on the perch, fly nimbly about in the cage, and twitter engagingly. These are Masked Lovebirds or Fischer's Lovebirds — *Agapornis personata Fischeri* — hailing from the very heart of Africa, from West Tanganyika. Several similar, frequently even more beautiful species live in other parts of equatorial Africa. These, too, may be seen in captivity, as they are favoured by many breeders. In the wild they nest in tree hollows, but they will sometimes also breed in a nest-box in captivity. These small parrots, as their name indicates, are extremely affectionate; a pair of Masked Lovebirds will constantly bill each other, and if one flies off somewhere the other immediately follows. Some species have a curious habit of bringing litter to their nest: the female sticks pieces of peeled tree bark, leaves or grass into her feathers above the root of her tail; after she enters the hollow, she ruffles her feathers and the 'building materials' fall out. She thus makes a nest into which she then lays her eggs. These parrots do not use their prehensile claws to hold their food as do many of the larger varieties.

Closely related to the order of parrots is the order of owls — *Strigiformes*. Let us take a closer look at one of these, and, for a change, after the many tropical birds we have just met, let us select one from the far north. It is a white owl, almost as large as the eagle-owl, living in the cold tundras and barren plains of northern Europe, Asia and America and all the way beyond the Arctic Circle. Its name is the Snowy Owl — *Nyctea scandiaca*. The young owls are white with dark brown spots or wavy lines, while the very old birds are as white as snow all over, only their sulphur yellow beautiful large eyes, similar to the cat's, being noticeable at a distance. The legs are covered with feathers so that just the sharp long black claws show underneath. The Snowy Owl is a diurnal bird, feeding on small rodents, chiefly lemmings, which



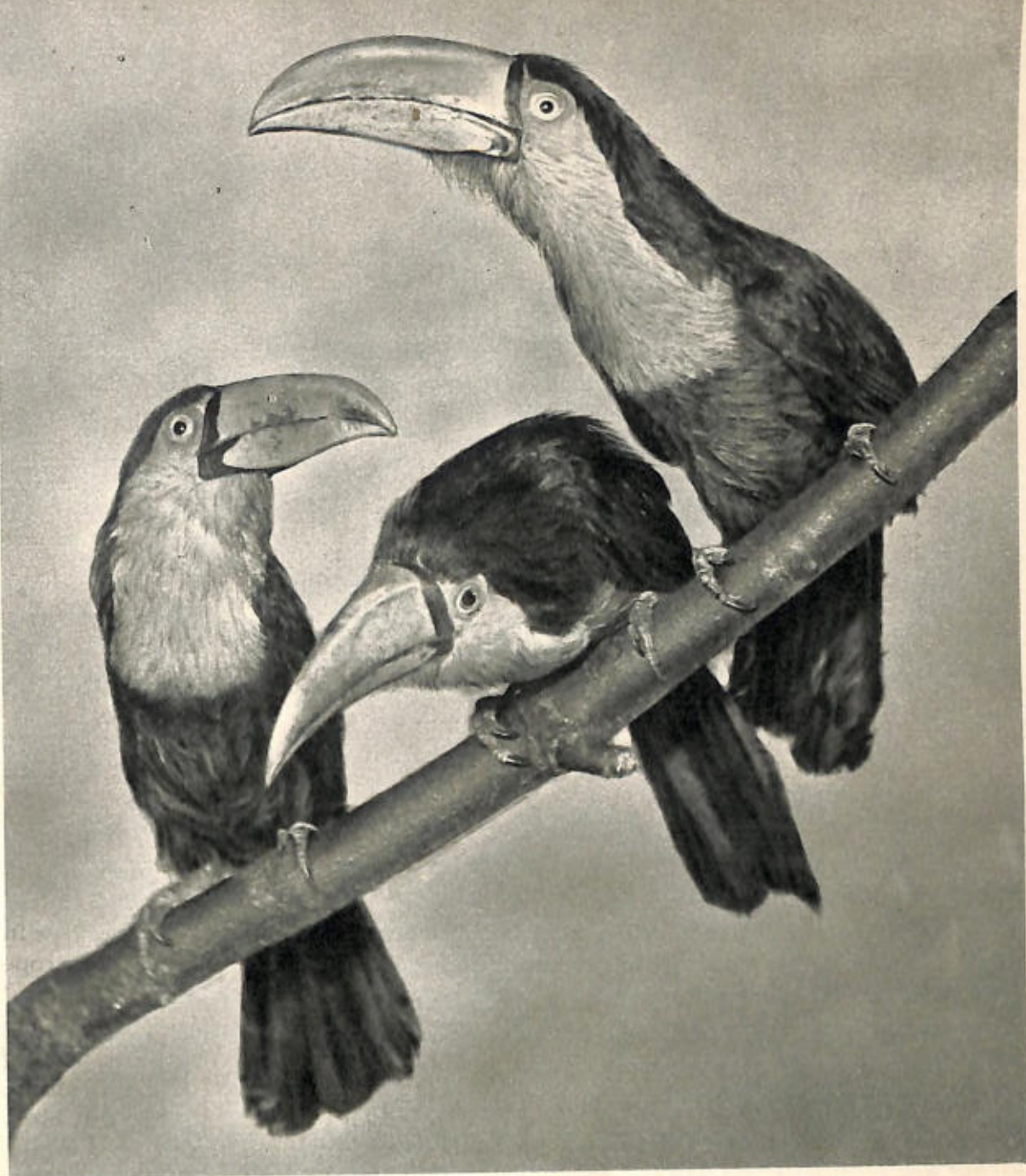


it hunts over the countryside, then settling in the place where it has found them. It also avidly hunts various small birds and mammals. It makes its nest on the ground among tufts of low grass, in a hollow slightly littered with dry grass and feathers. In the short northern summer it will mostly be found in mountainous areas, transferring to the lowlands and finally migrating south when winter comes. Single stray Snowy Owls have been known to get as far as Central Europe.

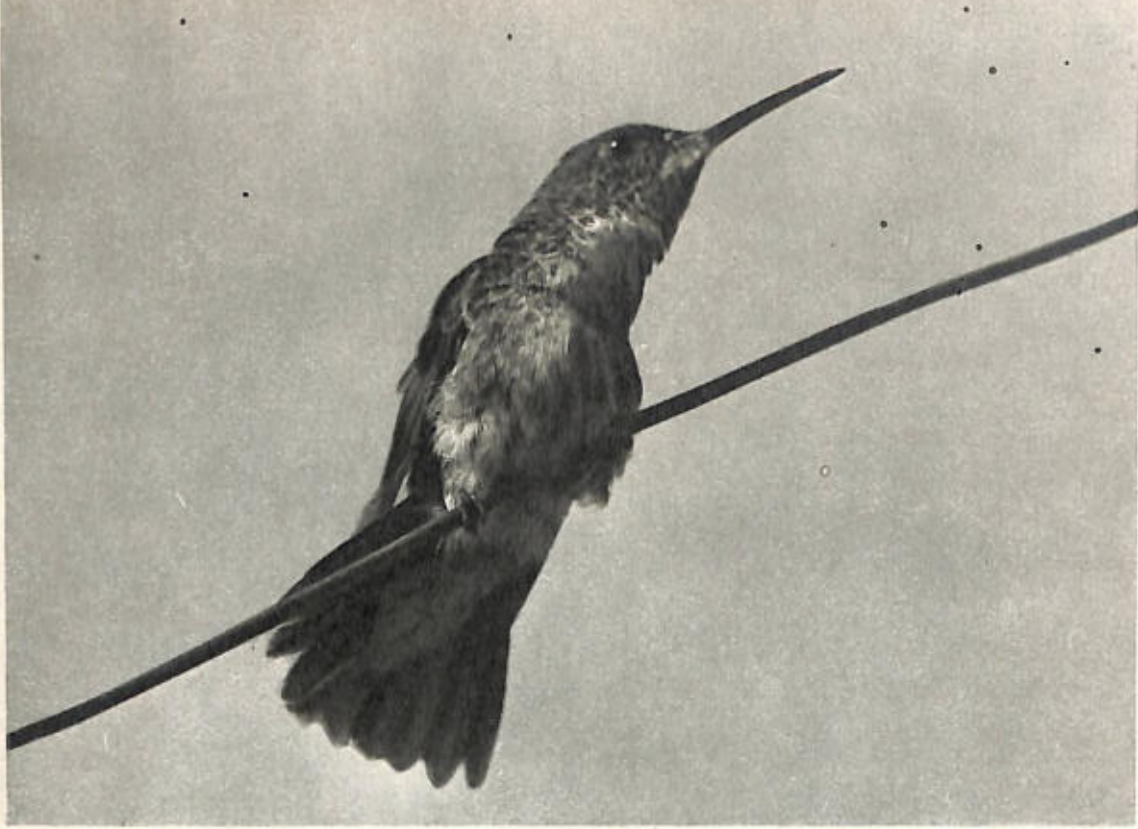


Truly bizarre in appearance are the bright toucans with their huge bills, flattened at the sides. In the zoological system they have been classified among the *Piciformes*, being placed together with birds of the woodpecker family — *Picidae* — and several related families in the joint sub-order of woodpeckers — *Pici*. Their legs with two toes turned forward and two backward are well suited to climbing; they have no fluffy feathers, their young are hatched blind in tree hollows, and they have many anatomical features in common with the woodpecker.

The Toco Toucan — *Ramphastos toco* — is the biggest of the toucan group, measuring up to 1 ft. 6 in. or more and its bill being as much as 6 in. long. If we watch a toucan hopping from branch to branch we may well wonder how he manages to carry that strong large bill about so easily. The answer is simple — though large, the bill is not heavy, since it is hollow inside. It has a framework of bones with air chambers between them. The Toco Toucan has black feathers on its body, red at the root of its tail, and yellowish white on the throat. There is a three-cornered yellow spot in front of each eye. This species has the largest bill of all the toucans, orange coloured, vivid red at the top and bottom edges, with a round black spot at the sides of the tip and black edging near the bird's head. Both jaws of the bill have sharp incisions at the edges, enabling the toucan to get hold of the fruits it picks and to grasp living prey securely. Toucans live on juicy fruits, seeds, berries and other vegetable food, they swallow large insects and hunt all the smaller vertebrates such as fledglings, lizards and so on. They will, however, also adroitly catch an adult bird that happens to be flying past and will swallow it whole. They spend most of their life in the thick green tangle of vegetation in the virgin forests of South America.

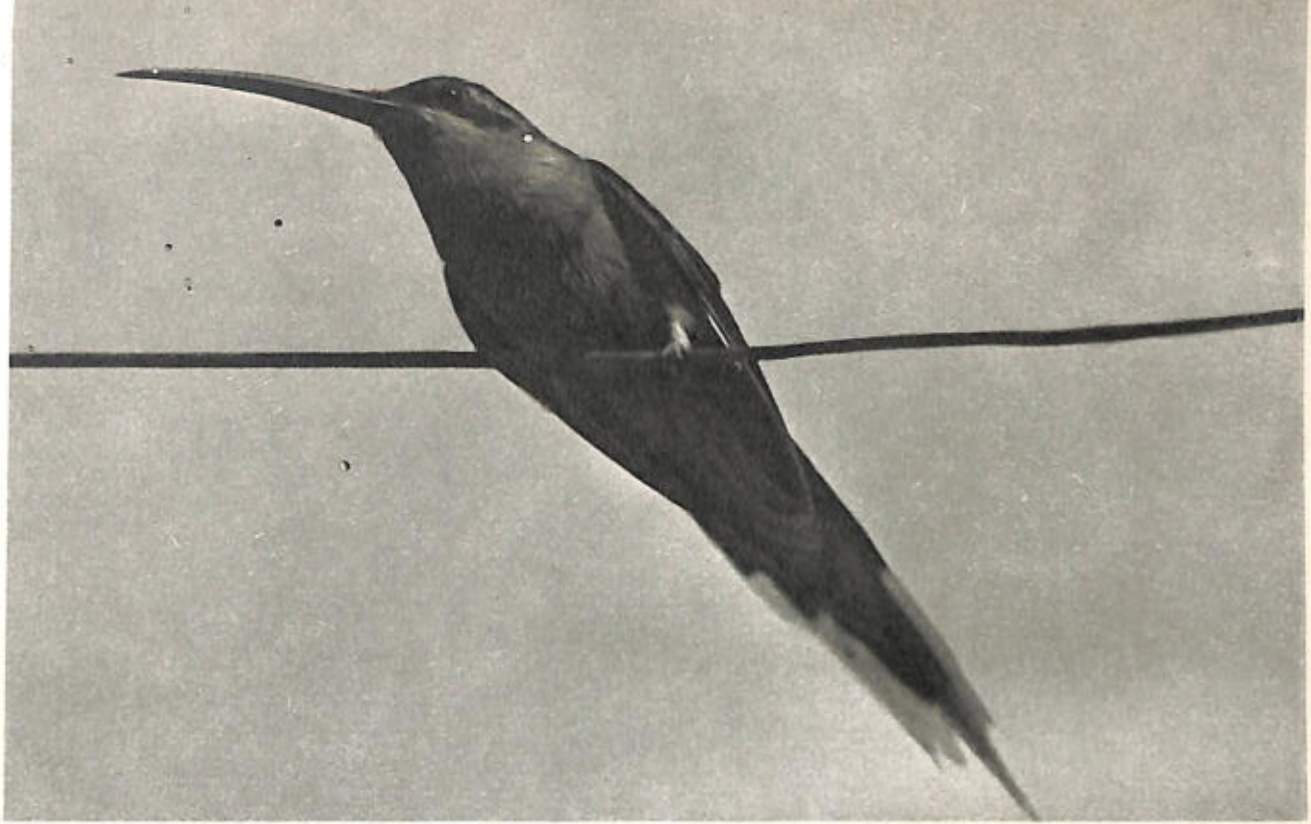


The Red-breasted or Green-billed Toucan — *Ramphastos discolorus* — is smaller, at the most 1 ft. 6 in. long. Its bill is greenish-yellow, the feathers of the body black on top, yellowish-orange on the throat, and red on the underside of the body and at the root of the tail. Since time immemorial these colourful birds have been hunted by the South American Indians who shoot them with blow-pipes and skin them, sewing their beautifully coloured skins on to their festive garments. Toucan meat is a well-known native delicacy, apart from which live, tame toucans are offered to foreigners in exchange for their goods. For this reason young toucans are taken from their nests by the Indians and tamed.



When European seafarers landed for the first time in the 'New World' — in America — they saw many new and incredible things. When they returned to Europe few people believed them when they told of having seen tiny little birds, some of them no bigger than a bumble-bee. And when in later times travellers brought back the first skins of these small birds, scientists examined them unbelievably, suspecting them to be artificial products or the work of native Indians. After careful study, however, nothing remained but to acknowledge the existence of the smallest birds in the world — the humming birds.

The humming bird family — *Trochilidae* — belongs, together with the swifts, to the order of *Macrochires*, the most accomplished fliers of all. Among the 500 species of humming birds known to us today some are so small that they only weigh 2 grammes! The largest humming bird is about as large as the common European swift, while the medium-sized ones, which form the majority, weigh 5 or 6 grammes. Everyone who has had the luck of being able to observe humming birds in the wild will speak enthusiastically of their amazing colours, which glow and glitter like precious stones. The flight of humming birds is remarkable, too; with absolute assurance they fly through even the slightest openings in the foliage, darting from place to place with the swiftness of electric sparks. They engage in daring aerial duels and suddenly stop dead in the air by a blossom, vibrating their wings at a speed equal to the revolutions of an aircraft engine, producing a buzzing noise not unlike the hawk moth. These wonderful little birds, which live on the nectar of flowers and on small insects, spend their entire life in the air, never touching the ground as long as

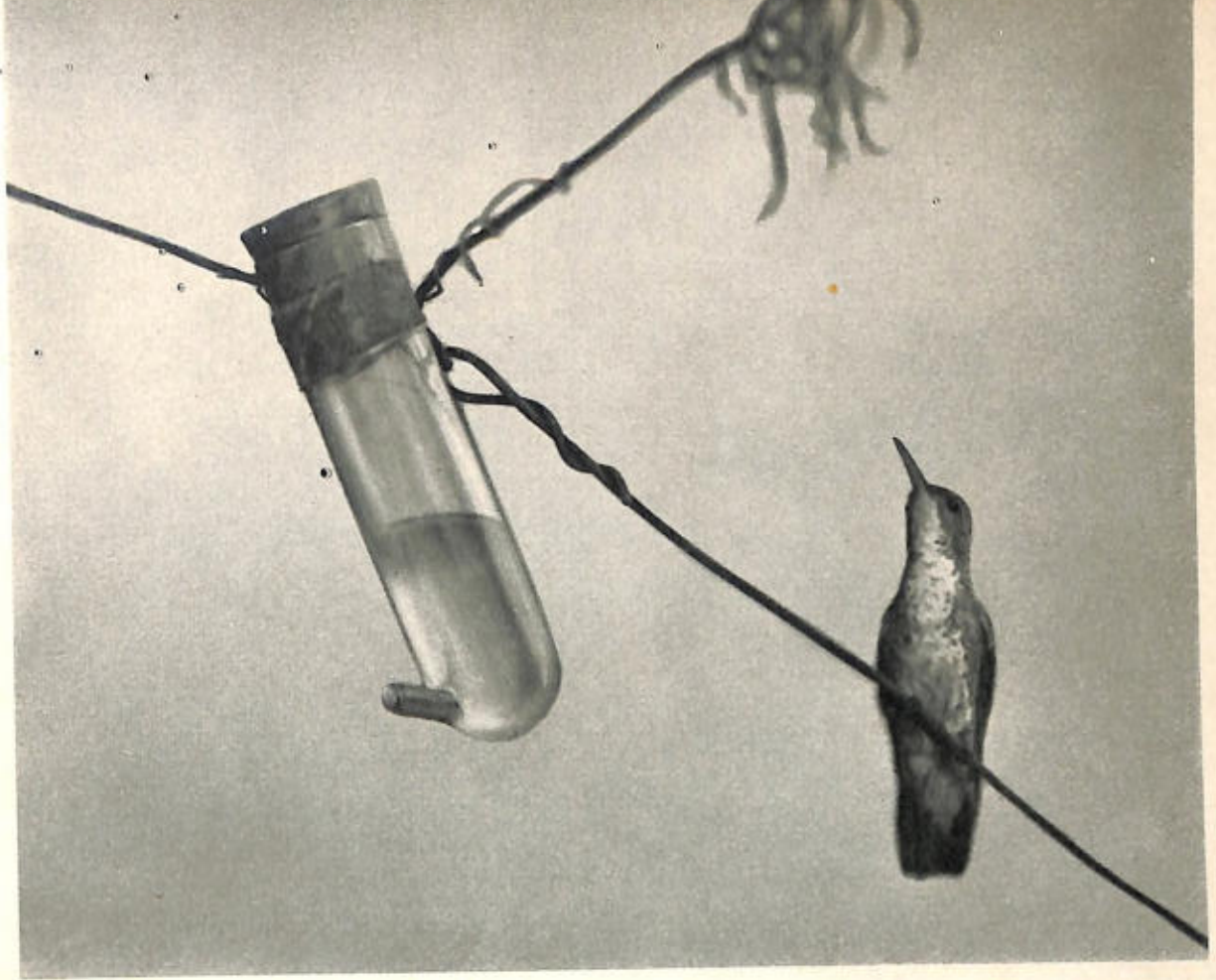


they are strong and healthy. When they stop flying, they do so for only a short while, hanging from or sitting on a flower or branch. They bathe in the dew on the leaves of trees and bushes. In flight they pick up lichen scales, cobwebs and minute vegetable matter off the trunks of trees and use them to build their nests. For a long time no one succeeded in bringing live humming birds to Europe and keeping them alive in captivity. Some of the larger zoos do have them these days, however, flying about in spacious cages equipped with rich vegetation and with ultraviolet lamps which are kept on all the time in order to compensate the birds at least partly for the hot sun of their homeland. But not even the most perfect nutritious solutions and the best care will keep captive humming birds alive for long. Several months, perhaps a year, at most four years... these are the greatest successes of the most painstaking breeders. Under the artificial conditions of captivity humming birds are never as fast or as beautiful as they are in their own country. Their flight is more leisurely and they rest more frequently, perching on the wires stretched beneath the roof of the aviary or glasshouse in which they are kept. The picture on page 72 shows the Least Humming Bird — *Mellisuga minima* — a glossy dark green in colour and with a black beak. It is fond of spreading out its blue-black tail feathers in the sun. This kind is only just over 2 in. long. It lives on the more southerly islands of the Great Antilles. The humming bird depicted on p. 73 belongs to one of the larger species. It is the Grey-throated Humming Bird — *Phaetornis griseigularis* — only faintly dark in colour, with a long, wedge-shaped tail that is narrower at the root than at the tip. This species measures over 4 in.



Ruby-crested Humming Birds — *Chrysolampis mosquitus* — are shown on page 74. They are dark brown with reddish-brown tails. The upper part of their head is a beautiful ruby colour, while their throat is a golden green. These colours show only when the bird turns at a certain angle towards the onlooker, otherwise these humming birds appear as mere dark, misty clouds in the air. Humming birds are known for their pollination of blossoms. Whole flocks of them visit blossoming trees, and when the trees and bushes lose their blossoms, the humming birds disappear as mysteriously as they came. The pictures show humming birds curiously examining an American orchid in the glasshouse.





Humming birds live only in North and South America, and there only in places where large flowers still open. This is chiefly in the central, tropical part of both Americas, although surprisingly enough their habitat extends far to the north to Alaska and deep south to the farthest corner of Tierra del Fuego. Individual species live exclusively in certain localities, some in mountains at altitudes of 16,000 ft. Those living in the north migrate southwards before the winter, like our migratory birds in Europe. Breeders usually give them the most natural food possible, as they thrive best on that. Twice a day their special receptacles are filled with a fresh solution composed of honey, cane sugar, water, flour, and condensed milk. This sweet juice is naturally not enough for the eternally hungry birds which are used to eating small insects. Therefore breeders have to provide them with minute flies, preferably *Drosophila*, which are obtained from fermented fruit. Occasionally these flies will be let out into the area where the humming birds are flying about. Then it is possible to watch the birds either catching them in the air to the accompaniment of audible clacking of their little beaks, or collecting them off the glass. From time to time the birds take a drink out of the hanging receptacles and then rest.

The humming bird on page 75 is the White-throated Humming Bird — *Leucochloris albicollis*. It is dark green and glossy, white on the underside of the body. It measures about 4 in. and comes from Paraguay and southern Brazil.



The humming birds will become used to taking their food from the hanging receptacles just as if they were the blossoming flowers of their homeland. They may be watched as they stop in mid-air, rapidly vibrate their wings, push their beak into the narrow tube, put out their bristly tongue and suck the nutritive solution. It is a strange fact that most of these tiniest of birds are not afraid of man even in the open. They behave as though they did not take the slightest notice of people, and yet we can see that they are constantly keeping an eye on us. In the glasshouse they come quite readily to feed from a receptacle held in a human hand and without sign of fear will accept the offered refreshment. Watching these wonderful little creatures, so agile, brave and charming, we cannot help feeling thankful that the time of their wholesale extermination is a thing of the past. It is indeed a sad thought that they were killed in their thousands to satisfy the fashionable craving for ladies' hat ornaments.





In the forested steppes and deserts of North East and North West Africa lives a strange bird, almost 2 ft. long, which walks on the ground collecting large insects, molluscs and all the smaller vertebrates. With its tremendous but light cellular bill it kills its prey, throws it up into the air, catches it and swallows it. This is the Abyssinian Ground Hornbill — *Bucorvus abyssinicus* — the largest of the hornbill sub-family, which is classified together with the hoopoe family — *Upupidae*. It is thus a relative of the European hoopoe. It is a very strong bird with glossy black feathers and rather long legs. Its bill is extremely curious. It does not close in the middle, and on top at the root it has a strong, hollow horn, open in front, the purpose of which is not known. The bird's upper eyelid has stiff, long eyelashes. The bald patch around the eye and the bare wattle under the head are bluish-grey in colour. These unusual looking birds mostly walk on the ground; they do not like to fly despite the fact that they are capable of flying. They nest in the hollows of trees. Their queer, exotic appearance makes them popular with the visitors to zoological gardens.

A similar species, the Great Indian Hornbill — *Dichoceros bicornis* — lives in the virgin forests of the Indo-Malayan region. This bird has a split horn on top of a huge bill which, in spite of its size, is light because of its hollow cellular structure. It is a slightly smaller variety than the African one, but nevertheless measures up to 1 ft. 6 in. Its feathers are black and white. The upper part of its bill is a vivid yellowish-red, the bottom part yellow, while at the root it is black. In contrast to the preceding African species, the Indian hornbill is a tree bird; it flies and hops about from tree to tree and lives mainly on fruits, especially of the fig variety. The hornbills, however, like to vary their diet with meat from time to time. This and other similar species of birds have a very interesting method of nesting: the female spends the nesting time inside a hollow tree and either walls herself up or is walled up by the male with dung. Only a narrow aperture is left, through which the male passes her food. When the young birds are sufficiently developed, the hornbills break open the wall and leave the nest, though sometimes the female will leave the nest even before the fledglings are mature. Different species show numerous variations of this type of nesting. It seems that the extremely narrow opening to the hollow helps to guard the birds from beasts of prey and monkeys, which often loot birds' nests.





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