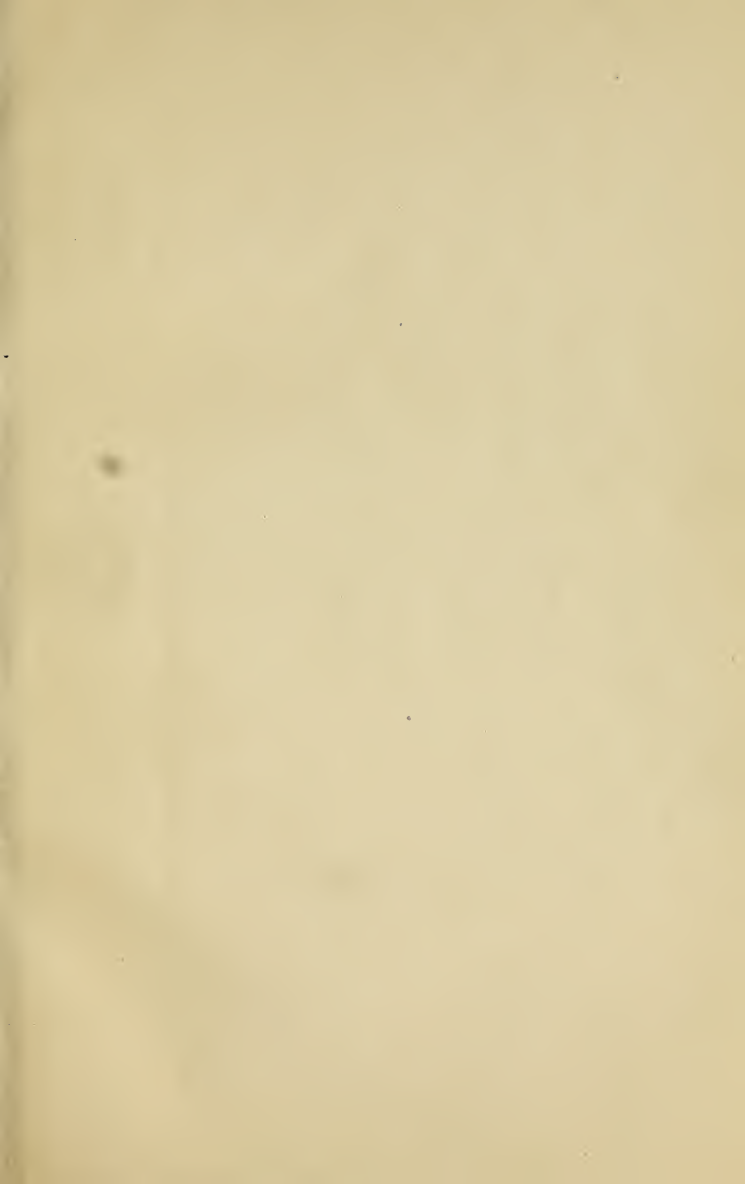
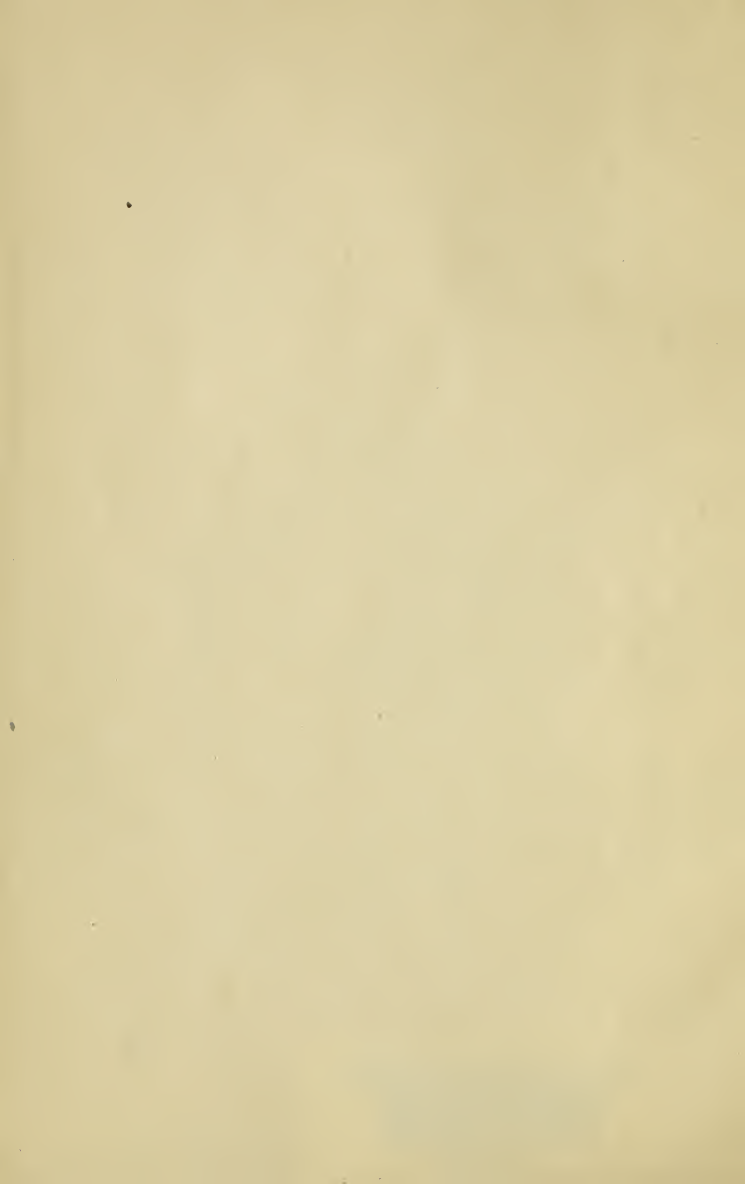


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GUIDE

TO THE .

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NATURAL
HISTORY.

HON. WALTER ROTHSCHILD'S ZOOLOGICAL MUSEUM

AT

TRING.

BY

E. HARTERT.

TRING, AUGUST 1898.

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PRINTED BY

HAZELL, WATSON, AND VINEY, LIMITED,

LONDON AND AYLESBURY.

THE MUSEUM IS OPEN FREE

From October 1st to April 1st:

MONDAYS and TUESDAYS	...	...	...	from 1 to 4
WEDNESDAYS	...	...	...	„ 4 „ 7
FRIDAYS	...	...	from 10 to 12 and	„ 2 „ 4

From April 1st to September 30th:

MONDAYS and TUESDAYS	...	...	...	from 3 to 6
WEDNESDAYS	...	...	...	„ 3 „ 7
FRIDAYS	...	...	from 10 to 12 and	„ 3 „ 6

This "Guide" is not meant to be an enumeration of all the specimens exhibited, but only to call attention to the more interesting or rarer ones, and to inform the visitor of the interest attached to certain animals, on account of their strange habits, structure, or otherwise. It is naturally only very short, as it is intended for the use of the visitor while in the Museum.

INTRODUCTORY REMARKS.

THIS museum originated in a small collection of butterflies, moths, and birds formed by Mr. Walter Rothschild when he was a boy. Gradually the collection assumed such large proportions that he conceived the idea of establishing a museum, which he carried out by erecting the present building.

In 1892 Mr. Ernst Hartert was appointed curator of the zoological collections, and in 1893 Dr. Karl Jordan was entrusted with the entomological section. Mr. Hartert now superintends the management as director of the museum under Mr. Rothschild's orders. A caretaker, A. Minall, lives on the premises, and acts also as taxidermist.

The museum is divided into two sections ; the one consisting of animals of all kinds is open to the public, while the second, situated at each end of the public galleries, and consisting only of ornithological and entomological specimens, as well as an extensive library of works on zoology, is reserved for the use of students and scientific research only.

A periodical called *Novitates Zoologicae* is published in parts, containing the outcome of the scientific research carried on at the museum itself. This work was begun in 1894, and forms an annual volume of 400 to 600 pages, with at least ten to fifteen plates. It can be procured for an annual subscription of one guinea at the museum, or from any bookseller.

GUIDE.

ON entering the Museum by the public door, and not ascending the staircase, the visitor finds himself in a large hall, and here to the left are placed the cases of mammals, to the right the birds.

The first small case on the left contains the lowest mammals, the

Monotremata,

i.e. the peculiar **Duckbill** or *Ornithorhynchus*, and the **Spiny Anteaters** or *Echidnae*. The most striking characteristic of these interesting animals is the fact that their young are produced from eggs laid by the female. The Duckbill (*Ornithorhynchus anatinus*) is an inhabitant of Australia. The smaller species of Spiny Anteaters, *Echidna aculeata* and allies, are found, in a number of local forms, in Australia, Tasmania, and Southern New Guinea, while the larger species, *Echidna* (or *Proechidna*) *bruijni*, and the rare *E. nigroaculeata*, occur in Northern New

Guinea. The latter species is only, at present, known from the two specimens in the Tring Museum, which, together with the skeleton, intestines, and reproductive organs, are exhibited in this case.

The next case on the left contains the

Apes (Simiidae),

i.e. the enormous Gorilla from Gaboon in West Africa, the red-haired Orang-Outan from Borneo and Sumatra, and the Chimpanzees from the forest region of Western Africa. Of the latter we see not only the ordinary Chimpanzee (*Anthropopithecus troglodytes*), but also the much rarer species, the Kooloo-Kamba or bald-headed Chimpanzee (*A. calvus*), one of them being an old friend of many Londoners, the well-known Sally who used to attract the public for many years in the Zoological Gardens at Regent's Park. Besides her mounted skin, all her bones are set up in this case.

In the following case are exhibited the

Gibbons (*Hylobates*) and Monkeys.

The Gibbons really belong to the *Simiidae*. They are remarkable for their enormous arms, by means of which they swing themselves for prodigious distances from tree to tree, and their powerful howls, which can be heard at an enormous distance. The

Siamang (*Hylobates syndactylus*) in this case was shot by the writer in the forests of N.E. Sumatra, and is probably the finest of its kind in any museum.

Among the Monkeys we see the ugly Baboons (*Cynocephalus*), the beautiful Guereza (*Colobus guereza*), and the fine Himalayan Langur (*Semnopithecus schistaceus*), grey with a black face, a close ally to the sacred Hanuman Monkey, so well known to all residents and travellers in India.

In the following case on the same side are shown the

Lemurs (Lemuridae),

and at the bottom a few of the small American Monkeys, such as the Marmosets (*Midas*) and Teetees (*Callithrix*). The Lemurs are remarkable in the Tring Museum for the great number of species exhibited, among them the *Propithecus majori*, described by Mr. Rothschild, and other rarities. The true *Lemuridae* are only found in the great island of Madagascar, while the Galagos (*Galago*) and the Potto inhabit Africa, and the *Lorisinae* (*Loris*, *Nycticebus*), belonging to different subfamilies, and the more distantly related Tarsiers (*Tarsius spectrum* and allies), inhabit the oriental regions.

A few more Monkeys are displayed on the top of the cases containing the *Monotremata* (see p. 7) and the Kiwis (see p. 22), among them the South American Black Howling Monkey (*Mycetes*) and the

large rufous Bornean Proboscis Monkey (*Nasalis larvatus*), as well as several albinos.

The fifth case gives an idea of the

Seals on the upper shelves, **Chiroptera** and **Insectivora** on the lower.

Of the Seals one of the finest is the Harp-Seal or Greenland Seal, of a yellowish white colour, with a somewhat harp-shaped black mark on the back. This Seal is Arctic in its distribution, and a very rare and casual visitor to the British Islands. Up to this year only one skull had been definitely identified as a British specimen; but this specimen was taken near Bournemouth, on the Hampshire coast, and is thus the first complete British specimen on record. There is also the Common Seal (*Phoca vitulina*) and the rare Caspian Seal (*Ph. caspica*).

Among the *Chiroptera*, the flying mammals, as they may well be called, being the only class of mammals with real wings and power of flight, we find two natural groups, *i.e.* the generally larger fruit-eating Bats, commonly known as "Flying Foxes" or Fox-Bats, which are (as, for example, in Calcutta) very destructive to ripe fruit, and the generally smaller insectivorous Bats, to which all our British species belong. The South American Vampire Bats are bloodsuckers, either partially or entirely. An interesting form is, above others, the *Cheiromeles torquatus*,

a practically naked Bat inhabiting Malacca, Sumatra, and Borneo, differing also in many other ways from all others. In no species of Bat is the skin so thick and devoid of hair, and in none is the gular glandular apparatus so greatly developed; none has such peculiar nursing pouches, which are evidently necessary for the young, which could scarcely otherwise succeed in maintaining its hold on the naked body of the mother during flight. This Bat has also a most extraordinary smell. The writer of this shot one in the dark in Sumatra, and though unable to see it in the long grass, found it very soon on account of its intense musky smell.

The *Insectivora*, or insect-eating mammals, comprise a large number of mostly small animals, to which the Shrews, Moles, and Hedgehogs in our country belong. The true Shrews (*Sorex*) in England comprise two species, *S. vulgaris* and *S. minutus*, both of which have been captured at Tring, and there is also one called Water-Shrew or *Crossopus fodiens*. The Mole (*Talpa europaea*) is exhibited in a number of varieties, white, buff, and particoloured, which are rather frequent in this species, while white or partly white Shrews may be looked upon as much rarer. One of the most interesting groups of the *Insectivora*, however, are the Tree-Shrews or *Tupaia*e, of which there is a good series. These animals are chiefly arboreal, and their appearance is so Squirrel-like that they are constantly mistaken for Squirrels

when running along the branches of the high trees in their home, the Indo-Malayan forests. The Malays do not distinguish between them and the Squirrels, calling them all "Tupai," the word from which the scientific name of the genus has been taken. The most curious form is the Penta-tailed Tree-Shrew, *Ptilocercus lowi*, with a long racket-like tail. The order of the *Insectivora* moreover teems throughout with interesting forms, and among them we may mention the *Macroscelidae* of Africa, the peculiar Desman (*Myogale moschata*) and the allied *M. pyrenaica* from Spain, and a number of forms recently discovered in Madagascar by Dr. Forsyth Major.

In the sixth case are displayed a number of forms of the larger order of

Carnivora.

There are here beautiful varieties of the Common Otter (*Lutra lutra* or *Lutra vulgaris*), as well as the Irish Otter, which is a local subspecies of the Common Otter. There are the five *Mustelae* of the British Islands, *i.e.* the Common Weasel, *Mustela vulgaris*, the Irish Stoat, *M. hibernica*, the Stoat or Ermine, *Mustela erminea*, in many varieties, the Polecat, *M. putorius*, and the Marten, *M. martes*. The Badger is represented in its ordinary colour, and by a partial and a total albino; the Sable (*Mustela zibellina*) is exhibited, as well as the Raccoon (*Procyon lotor*), so well known

to visitors of Zoological Gardens, and the beautiful Panda (*Aelurus fulgens*) with its rich coat from the forests of the south-eastern Himalayas, where it is found at heights of from 7,000 to above 12,000 feet, and others.

The following corner case contains a continuation of the *Carnivora*, and we see in it, besides a number of smaller forms, a selection of Bears, *viz.* the Polar Bear, *Ursus maritimus*, in its constantly white coat, so well adapted to the icebergs and snow-covered fjords of its Arctic home, the Common Brown Bear, *U. arctos*, a head of the enormous Siberian form of the latter, the Black Bear of the Himalayas, *U. thibetanus* or *torquatus*, and the rarest of all Bears, the Particoloured Bear, *Aeluropus melanoleucus*, which differs in many points from the true Bears. It was discovered by that great naturalist Père David in the mountains of Moupin in Western China, and no specimens were to be found in any museum in Europe, except the types in the Jardin des Plantes in Paris, until recently Russian explorers collected specimens in Gansu in Western China, two of which were bought by Mr. Rothschild, one for the British Museum and the one exhibited here.

The next case, close to the large corner case, again contains a number of *Carnivora*. We find in it the Dog-tribe, *i.e.* the Wolves, Foxes, Hyaenas, etc. Of the latter two species are exhibited, the Spotted Hyaena, *H. crocuta*, a larger and bolder animal,

often troublesome to travellers, whose horses and donkeys are often frightened and even damaged by it, while the Striped Hyaena, *H. striata*, is a smaller and more cowardly carrion-feeder, only now and then dangerous to dogs, young goats, or sheep. Close to the Hyaenas stands also the curious little Aard-Wolf or Earth-Wolf of the Afrikanders, *Proteles cristatus* of zoologists. Another interesting animal is the little "Raccoon-Dog," *Nyctereutes procyonides*, of North-Eastern Asia and Japan.

The Fox (*Canis vulpes*) is represented in its Siberian, light, and long-coated variety, and the Arctic white Fox (*C. lagopus*) is also on view. Of the Wolf (*Canis lupus*) there is a very powerful Siberian specimen.

On turning round we find ourselves facing the corner case of one of the central rows, in which the

Cat-tribe, or Felidae,

are to be seen. There is in front of us a magnificent Jaguar, *Felis onca*, and also the very rare totally black variety of the same, as well as a black Leopard, *Felis pardus*, and an ordinary coloured one, and good Pumas, *Felis concolor*, of different varieties. Returning along the passage by which we came, we find a magnificent Tiger and Lion, and a hybrid between these two very different animals, which was bred in a menagerie in Austria. Besides Wildcats

from Scotland and other smaller Wildcats, we find further the Cheeta or Hunting Leopard, *Cynaelurus jubatus*, a large but graceful slender Cat, which in many parts of Asia is trained and used for the chase of Gazelles and other Antelopes. Remarkable for its beauty is also the Ounce or Snow Leopard, *Felis uncia*.

Above these Cats we see the heads of

Buffaloes, Gaur, and Bison.

The following case to the right contains on the top the heads and also entire specimens of the Goat-like forms, such as the European Alpine Ibex, *Capra ibex*, the Markhor, *C. falconeri*, from Cashmere, Afghanistan, and Gilgit, the Thar, *C. jemlaica*, and others, and below these the

Rodents.

Of this extremely large family the well-known Hare is exhibited here in different species and subspecies, the Common Hare, the Mountain Hare, the Irish Hare, as well as the albinos and other varieties. The familiar "Bunny," *Lepus cuniculus*, is also present. Less familiar to most people will be the Urson or Canadian Porcupine (*Erethizon dorsatus*), of which there is also an albino, and the Common Porcupine (*Hystrix cristata*), which is represented by an extraordinarily fine specimen. Others of interest are the

Beaver, the Marmot, and the Jerboas. Of the Beaver both species, the European Beaver, *Castor fiber*, which formerly inhabited the greater part of Europe, and was to be found in England as late as the twelfth century, but is now restricted to a few places on the Rhone, near Magdeburg on the Elbe, and a park on the banks of the Danube, and the American Beaver (*C. canadensis*), are mounted.

The following, the third case in this row, displays the different sorts of

Wild Sheep

on the top, and some more **Rodents** below.

Of the Wild Sheep we find, mostly heads, the Caucasian Burrhel, *Ovis cylindricornis*, the Moufflon of Sardinia and Corsica, *Ovis musimon*, the American Bighorn or Mountain Sheep, *Ovis canadensis*, the Aoudad or Barbary Sheep, *Ovis tragelaphus*, an inhabitant of the mountain-ranges of North-Western Africa, the rare and magnificent *Ovis poli*, or Marco Polo's Sheep, and *Ovis nivicola*, the Snow Sheep, from the Stanovoi Mountains and Kamtschatkan Hills.

The Rodents are numerous, and it will be sufficient here to call special attention to the beautiful collection of varieties of the Squirrel (*Sciurus vulgaris*); the Rats and Mice, among the latter the pretty little red Dormouse, *Muscardinus avellanarius*, which is common

in many parts of England, and not rare near Tring; the European Hamster (*Cricetus frumentarius*), and its skeleton showing the large cheek-pouches, the walls of which are connected with muscles arising from the lumbar vertebrae, and which are filled with grain; the little Lemmings (*Myodes lemmus*) from Norway, famous for the sudden appearance of vast numbers, and the persistent wanderings they undertake, until they perish entirely.

Far more remarkable, however, in outward appearance are the **Flying Squirrels**, which, although they cannot really fly, float through the air for long distances by means of a kind of parachute, *i.e.* an extension of the skin between their legs and generally also between the tail and hindlegs. The finest and largest of these is the great Chinese *Pteromys alborufus*.

The next case, the last in this line, is the corner case, containing on the top the heads of

Deer and Roe,

and also some entire mounted specimens of these animals. We see here also a black Roebuck, a variety not very rare in certain parts of Germany. The Roe (*Cervus capreolus*) is common in Scotland, but not so plentiful as in some parts of Germany, where the stalking and shooting them with the rifle is rightly considered a first-rate sport. Below the Deer two species of the Wombat (*Phascolomys*) are

seen, and a very fine specimen of the so-called Tasmanian Wolf (*Thylacinus cynocephalus*), a large predaceous Marsupial or pouch-bearing animal, in outward appearance like a dog or wolf. The "Tasmanian Devil" (*Sarcophilus ursinus*), an animal of rather ferocious and destructive habits, is a close ally of the *Thylacinus*. Turning round to the narrow side of the case we see in the centre the interesting Chinese Water-Deer (*Hydropotes inermis*), which, although a true Deer, resembles the rather aberrant Musk-Deer (*Moschus moschiferus*) in the absence of horns or antlers in either sex, and the elongated canine teeth. It is also remarkable for its great fertility, a character not otherwise observed among the *Cervidae*. Its home is China, and it is of the size of the Muntjac (*Cervulus muntjac*), which has, however, little antlers placed on the top of a pair of exceptionally long pedicles. This Muntjac, together with the head of a Musk-Deer and the small Chevrotains or Pigmy Deer, we have already passed on the long side of this case. The latter are by no means true Deer, but stand rather by themselves, forming the family *Tragulidae*, with one genus *Tragulus* (best known species: *memmina*, *javanicus*, *napu*, and *stanleyanus*) in the Indo-Malayan countries and India, and another (*Dorcatherium*) in West Africa.

Above the Water-Deer we see, among others, an enormous Wapiti head, and below it a number of small

Marsupials,

which are continued on the next side of the case, along the central passage. The *Marsupialia*, as everybody knows, are characterised by having a "pouch" (*marsupium*), into which the helpless and quite rudimentary young are transferred by the mother immediately after birth.

This order is composed of a great many forms. Some of these closely resemble in their outward appearance animals of other orders. So we find the *Thylacinus* (see above) looking like a wolf, others like rats and mice, the flying Phalangiers (*Petauroides*, *Petaurus*, *Gymnobelideus*, *Acrobates*) like flying squirrels, the Koala or "Native Bear" (*Phascolarctus cinereus*) of the Australian colonists, resembling a bear, the *Dasyuri* more or less like some of the smaller *Carnivora*. *Notoryctes typhlops*, a recently discovered species, resembles a mole, and lives in a similar way. The Cuscus (*Phalanger*) are plentiful, both in species and varieties, and the Opossums (*Didelphis*) which inhabit America, while the other Marsupials are confined to the Australian and Papuan regions of the world.

Above the Cuscus, Koala, etc., we find again heads of various Deer, among them a large head with very good horns of the Sambar or large Indian Deer (*Cervus unicolor* or *aristotelis*), so well known to Indian sportsmen, a Deer which, like its allies from

the Sunda Islands (*C. equinus* of the Malay Peninsula, Sumatra, and Borneo, and others), has only three points to its antlers, the bez and trez tine being absent, the brow tine long, and the beam only simply forked.

In the next case in the central passage we find only Kangaroos, Wallaby, and Rock-Kangaroos, also some perfect albinos. Kangaroos are kept in numbers in Tring Park, and the Great Kangaroo (*Macropus giganteus*) does extremely well in the open grassland, while Bennett's Wallaby frequents the Park-wood and breeds freely. This latter (*Macropus* or *Halmaturus bennetti*) is a close ally of the Red-necked Wallaby (*M. ruficollis*). Gentle as these animals usually are, we had one case in which a large male "Boomer" (as the colonists call *M. giganteus*) became quite unbearable, attacking and dangerously wounding men, so that it had to be killed, and is now to be seen in the next case, in which again large Kangaroos fill the upper shelf, while in the middle we find the

Sloths,

Choloepus and *Bradypus*, of which a species of *Bradypus*, *Choloepus hoffmanni*, and *C. didactylus* are shown. Below we again see some more Kangaroos and Wallaroos (*Osphranter*), and between these and the Sloths (called also "Faultier" = "Lazy beast" in German) we notice the

Anteaters,

first of all the Great Anteater (*Myrmecophaga jubata*), with its enormously long, cylindrical skull, an animal of terrestrial habits ; the more arboreal Lesser Anteater or Tamandua (*T. tetradactyla*) ; and the pigmy Little or Two-toed Anteater (*Cycloturus didactylus*).

The following case, the last in this row, shows on the top an entire mounted Gaur (*Bos gaurus*) from India, and a head of the fine white cattle preserved in some Scotch parks, the so-called Chillingham Bulls, which are supposed to be survivors of an original wild species. Below these we find in this case representatives of the

Manidae and Dasypodidae.

The *Manis* or Pangolins may justly be termed the "scaled mammals," and are indeed called so in other languages, for they are covered (except on the lower surface) entirely with strong, large horny scales, thus giving the appearance of an enormous fir-cone, or, when rolled up in a ball, as they do if danger approaches, of a gigantic brown artichoke. They have, like the Sloths and Aard-Varks, and the quite toothless Anteaters and Armadillos, no front teeth, thus forming with them the order of the *Edentata* or toothless mammals. Of the *Manis*, the *M. gigantea*

from West Africa, *M. javanica* of the Malayan countries, *M. temmincki* from Africa, and *M. tricuspis*, the white-bellied Pangolin from West Africa, with a long tail, are shown.

Leaving the mammals and walking back through the central passage to the entrance, we now turn to the right, where we find, close to the entrance door, opposite the case of the Monotremes, a small case with a most peculiar group of birds, the

Kiwis or Apteryx.

These strange birds look as if they were wingless, and in fact they have no flight-feathers and the wing-bones are exceedingly small. There are no tail-feathers either, nor can they climb or swim. All they can do is run, and this is the reason why they have become rare in most parts of their home, New Zealand, and are in danger of becoming extinct in the course of time, especially through the introduction of Rats, Cats, and other animals. They are nocturnal and feed on worms, but can easily be kept with meat in our climate. Their eggs are incredibly large for their size, and only one is laid every year. All the known species are exhibited.

Walking along the bird cases to the right, in the same way as we did along the mammals on the left, we come to the large

Bird Case I.,

where we see on the top large Golden Eagles (*Aquila chrysaetus*), the most powerful Bird of Prey of the Palaearctic region. Below are two large Lammergeyers (*Gypaetus barbatus*), from Switzerland, where the species is now extinct, or nearly so, while it is still found abundantly in Spain (Spanish examples, however, seem to be smaller), and in the south-eastern parts of Europe and the Himalayas. Below the Lammergeyers or Bearded Vultures are the true Vultures. The largest of these is the Condor (*Sarcorhamphus gryphus*), from the Andes; the smallest the Egyptian Vulture (*Neophron percnopterus*), which inhabits South Europe and parts of Africa. Most peculiar, on account of its facial wattles, is the King-Vulture (*Sarcorhamphus papa*). Others are the Griffon Vulture (*Gyps fulvus*), the Rüppell's Vulture (*Gyps rüppelli*), and several more. In this case we find also the Secretary Bird (*Gypoggeranus secretarius*), and the enormous cast of a skull of *Phororhacus longissimus*. The bearer of this not very euphonious name is a gigantic extinct bird from Patagonia, and its affinities are as yet uncertain.

Case II. of the Large Bird Cases.

Eagles : another Golden Eagle ; the Spotted Eagle, *Aquila naevia* (or *clanga*), from Europe ; an Imperial

Eagle, *A. imperialis*, resembling the Golden Eagle, but smaller; the small Booted Eagle, *A.* (or *Nisaetus*) *pennata*. All these have the legs feathered to the toes, and are the real noble Eagles. Others, with the tarsus bare or partly so, are the large Sea-Eagle of Europe, *Haliaetus albicilla*, and its American representative, the somewhat smaller White-headed Sea-Eagle, *Hal. leucocephalus*, the American National Bird. The Sea-Eagles live chiefly on fish, and still more so the Osprey or Fish-Eagle, *Pandion haliaëtus*, while the Short-toed Eagle, *Circaëtus gallicus* (or *brachydactylus*), lives principally on snakes, reptiles, and other creeping animals. The *Circaëti*, however, are not true Eagles. The Buzzards, *Buteo*—of which the Common Buzzard, *Buteo buteo* (or *vulgaris*), although no longer common, still breeds in Great Britain—occur in many species all over the world. The Rough-legged Buzzard, with feathered tarsi like a true Eagle, but weaker and of the habits of an ordinary Buzzard, is placed in the genus *Archibuteo*. The European species is *A. lagopus*. Of this two specimens are exhibited which were shot (or caught) near Tring (Halton), and others from other places.

The “Bateleur Eagle,” *Helotarsus ecaudatus*, from Tropical Africa, is known from the remarkable evolutions it displays in mid-air during the pairing time, and characterised by a very short tail.

The genus *Falco*, the true Falcons, are well represented. There is the noble and beautiful white

Falcon, *Falco islandus* (or *candicans*), split up by some ornithologists into several supposed species—the “Iceland,” the “Greenland Falcon,” and others—and its close ally the darker Norwegian Falcon, *Falco gyrfalco*. The Peregrine, *Falco peregrinus*, although a powerful enemy of all feathered game, is still resident in a few places in Great Britain, as is also the graceful Hobby, *F. subbuteo*, a hunter of smaller birds and insects; while the Kestrel, *F. tinnunculus*, although—in spite of its generally acknowledged usual harmlessness—much persecuted by many gamekeepers, is still frequent in many parts of our islands. The Merlin, *F. aesalon*, is also a British bird, while the Red-footed Falcon is merely an irregular straggler.

The Birds of Paradise, *Paradiseidae*,

are the most brilliant of all birds, except the Humming Birds, which, however, are all much smaller. The *Paradiseidae* are only known from New Guinea and adjacent islands, with a few forms reaching to Australia. The variation in form of bill, plumage, and coloration is stupendous. While the Bower Birds, a group of *Paradiseidae* which build peculiar bowers and runs of twigs evidently for their pleasure, but not for breeding purposes, have all more or less short and plump beaks (see *Ptilonorhynchus sericeus*, for example), and do not excel as much in plumage as the rest, except the crested *Amblyornis*,

some others, like *Epimachus*, *Drepanornis*, have long curved thin beaks.

The true *Paradisea* are celebrated for the brilliancy of the elongated side-plumes and singular elongated tail-feathers. The *Parotiae* have six racket-like feathers on their heads; *Lophorina* has a kind of large mantle or umbrella over its back, and its green and black plumage is of simple but great beauty.

The most extraordinary Bird of Paradise, and in some way the most extraordinary bird of all, is King Albert's Bird of Paradise, *Pteridophora alberti*. This bird has two greatly modified feathers on the head, above the ears, each consisting of a long bare shaft and a great number of separated paper-like lappets of a sky-blue colour and enamelled gloss, these feathers being twice as long as the body. The discovery of this wonderful bird dates back only as far as 1894.

Besides the few types exhibited here for the benefit of visitors, Mr. Rothschild possesses the completest and finest collection of *Paradiseidae* in skins, many of which he has described himself for the first time.

Bird Case III.

contains the **Kites and Honey-Buzzards, Hawks, Harriers, Owls, Swifts, and Nightjars.**

Of the true Hawks we see the Goshawk (*Astur*

palumbarius) and the Sparrow-Hawk (*A. nisus*), both British and both fierce destroyers of bird-life; of the Harriers, Montagu's Harrier (*Circus cineraceus*), the Hen-Harrier (*C. cyaneus*), the Marsh-Harrier (*C. aeruginosus*), all British, and others.

The Honey-Buzzard (*Pernis apivorus*) is a large but harmless bird, principally feeding on wasps and their larvae, which is now of extreme rarity in the British Isles, while it was formerly much more frequent. It is a pity that the ignorance of most gamekeepers, who do not often distinguish between harmless and harmful "Hawks," has nearly exterminated this interesting bird in England, as well as the Common Buzzard and Kite. The latter, also called the Red Kite, *Milvus milvus* (or *regalis*), used to be common too, but is now extremely rare, and restricted to some forests in Scotland and Wales. In the fifteenth and sixteenth centuries the Kite used to be so plentiful as to act as a scavenger in the London streets. The writer, however, having had frequent opportunities of observing the Kite on the Continent, and its congener the Black Kite (*Milvus korschun*), found the latter much inclined to assume scavenger habits, the Red Kite on the other hand much more shy and retiring, and he has therefore a strong suspicion that the London scavenger Kites were Black Kites, although this bird has, to our knowledge, only once occurred in Great Britain during this century, while another specimen

shot a few years ago was proved to be a bird escaped from captivity.

The Owls, or nocturnal Birds of Prey, are remarkable for the softness and beauty of their plumage—a beauty not shown in gay and splendid colours, but in the harmonious composition of simple grey, brown, white, and yellow tints. The Eagle-Owl (*Bubo bubo* or *maximus*), of rare occurrence in the north of Great Britain, and its smaller American representative (*Bubo virginianus*), are both shown in different subspecies or geographical races, the paler forms coming from more wintry climates. Of British species we have the Long-eared Owl (*Asio otus*) and the Short-eared Owl (*A. accipitrinus*), the Barn-Owl (*Strix flammea*), the Tawny Owl (*Syrnium aluco*), Tengmalm's Owl (*Nyctala tengmalmi*), Little Owl (*Athene noctua*), Snowy Owl (*Nyctea scandiaca*), and the American form of the Hawk-Owl, which has occurred a few times as a straggler, the European Hawk-Owl (*Surnia ulula*) having been obtained only once with certainty. The rarest Owl exhibited is the New Zealand Laughing Owl (*Sceloglaux albifacies*), now nearly extinct. The specimen here shown had been kept alive for a long time by Mr. Rothschild.

The “Goatsuckers” or “Nightjars” (*Caprimulgidae*), as well as the closely allied *Podargidae*, or “Frog-Mouths,” are also nocturnal, and therefore resemble in plumage the Owls, with which they share the noiseless flight, but are otherwise probably not in

the least allied to the Owls. There are a great number of foreign species, some of great beauty and with enormously elongated feathers either on the wing or tail; while there is only one Central European species, our *Caprimulgus europaeus*, the Common Nightjar. The *Podargidae* occur from India to Australia.

The Swifts (*Cypselidae*), represented in this country by the Common Swift, *Apus apus* (or more often—though less correctly according to priority—called *Micropus apus*), while two others, the Alpine Swift (*A. melba*) and the Needle-tailed Swift (*Chaetura caudacuta*), have occurred in exceptional cases, are the most powerful and swiftest fliers of all birds. Although generally of sombre colours, they are an interesting group in many ways, the most singular being the little swiftlets, or *Collocaliae*, of the East, which make nests, generally in caves and attached to the rocks, out of their own spittle, some being entirely formed of this material, others partly consisting of moss, rootlets, or weed, glued together and on to the rock with their spittle. The salivary glands of most Swifts are enormous, and also our Common Swift uses some of its saliva to fix its nest.

Bird Case IV.

contains, above, several groups of Picarian birds, as the Motmots or *Momotidae*, a neotropical family (genera: *Momotus*, *Urospatha*, *Prionorhynchus*, and others); the Rollers, *Coraciidae*, with only one

European species, the Common Roller, *Coracias garrulus*; the Kingfishers, a family of many species in tropical countries, but again with only a single European form, our lovely Kingfisher, *Alcedo ispida*, with its beautiful glossy eggs; the Bee-Eaters (*Merops apiaster* alone in Europe), and their American representatives in Nature's household, the Jacamars or *Galbulidae*, and the beautiful golden green and red Trogons, *Trogonidae*.

Farther down in this case are a number of Passerine groups of birds. The Honey-Eaters, *Meliphagidae*, are remarkable for their brush-like tongue, by which they take for food the nectar out of the flowers, among them the curious-looking "Parson-bird" of the New Zealanders, *Prothemadera novaeseelandiae*, which received its English name from the two tufts of curled and filamentary white feathers on the neck, supposed to resemble the bands worn by clergymen, until lately. The Titmice or Tits, *Paridae*, are a family which is more frequently represented in cooler climates than within the tropics. We have even in England quite a number of them, mostly differing more or less from their Continental brethren. They are: British Great Tit (*Parus major newtoni*), Blue Tit (*Parus caeruleus*), English Coal-Tit (*Parus ater britannicus*), British Marsh-Tit (*Parus palustris dresseri*), all common near Tring; Willow-Tit (*Parus salicarius*), not in the case and not yet observed in Hertfordshire, and evidently very rare in England,

though resident and sometimes confounded with the former; Crested Titmouse (*Parus cristatus*), only in a few forests of Scotland, but common in pine-woods on the Continent; the Western Long-tailed Titmouse (*Acredula caudata rosea*), and the Bearded Tit (*Panurus biarmicus*), now very rare in England. Close allies of the Tits are also the Nuthatches (*Sitta caesia*), and the Golden-crested Wren (*Regulus cristatus*), not rare in Great Britain, a second species, the Fire-crested Wren (*R. ignicapillus*) being of rare and exceptional occurrence in England. These latter two are not very appropriately called Wrens, the real Wren, *Anorthura troglodytes* (or often, though less accurately, called *Troglodytes parvulus*), belonging to a different family of birds, to which the lovely Dipper, *Cinclus aquaticus*, is more nearly related.

In this case is also the numerous assemblage of the Warblers and allies, Hedge-Sparrows, Wagtails, Pipits, and Thrushes. Of these the following are of regular occurrence in Great Britain:—

The Whitethroat (*Sylvia sylvia* or *cinerea*), Lesser Whitethroat (*S. curruca*), Blackcap (*S. atricapilla*), Garden-Warbler (*S. hortensis*), Dartford Warbler (*S. undata*), Common Hedge-Sparrow (*Accentor modularis*), Chiffchaff (*Phylloscopus rufus*), Willow-Wren (*Ph. trochilus*), Wood-Wren (*Ph. sibilatrix*), the Common Reed-Warbler (*Acrocephalus streperus*), Marsh-Warbler (*A. palustris*), a rare British bird, Great Reed-Warbler (*A. arundinaceus* or *turdoides*), Sedge-

Warbler (*A. phragmitis*), Grasshopper-Warbler (*Locustella naevia*), while Savi's Warbler (*Loc. luscinioides*) seems now to be extinct in England.

Of Wagtails again the two most common English species differ from those of the Continent, the Pied Wagtail, *Motacilla lugubris*, generally taking the place of the White Wagtail, *M. alba*, which is universally distributed over Europe, but rather rare in England, the Yellow-headed Wagtail, *Motacilla rayi* (or better *flavissima*), representing the Continental Blue-headed Wagtail, *M. flava*, which is only a straggler to Great Britain, though not a rare one in Sussex, the Grey Wagtail, *M. boarula*, again being the same as all over Europe.

Of Pipits the common British species, Tree-Pipit (*Anthus trivialis*), Meadow-Pipit (*A. pratensis*), Rock-Pipit (*A. obscurus*), and the rarer visitors, such as the Tawny Pipit (*A. campestris*), are represented.

Of the Thrushes we see a good collection, the Blackbird (*Turdus merula*), Song-Thrush (*T. musicus*), Redwing (*T. iliacus*), Missel-Thrush (*T. viscivorus*), Ring-Ouzel (*T. torquatus*), Fieldfare (*T. pilaris*), all being present, and many of them beautiful pied varieties and albinos. The Wheatear (*Saxicola oenanthe*), the Whinchat (*Pratincola rubetra*), and Stonechat (*P. rubicola*) are also to be seen. Allied to these is also the supposed finest songster of the world—though perhaps eclipsed by the North-Eastern Nightingale or Sprosser, *Luscinia philomela* and

equalled by some foreign species—the celebrated Nightingale, *L. luscinia*. Also our familiar friend Robin Redbreast, *Erithacus rubecula*, the beautiful Bluethroats, *Cyanecula*, and the two Redstarts, the common *Ruticilla phoenicurus* and the black *R. titys*, are here exhibited.

Near the Tits is also a dowdy-looking bird which requires the attention of visitors, as it is not well known by all, although not a rare bird in our parks, woods, and larger gardens: the Tree-Creeper, *Certhia familiaris*, the English race of which, *C. familiaris britannica* (sic!), differs perceptibly from the Continental form. Some exotic species of the *Timeliidae* are also on view.

Bird Case V.

On the top shelves are displayed the Crows, Ravens, and the rest of the wide-spread family of the *Corvidae*, which are, perhaps, the most highly developed birds.

They are the largest Passerine birds. In England we have still the large Raven, *Corvus corax*, while the Carrion Crow, *C. corone*, is found breeding everywhere, but its grey congener, *C. cornix*, the Hooded Crow, is only a winter visitor in most counties, except in the north of Scotland, while the Rook, *C. frugilegus*, breeds most frequently in colonies.

A smaller and more elegant form is the lively little Jackdaw, *C. monedula*, also a common British bird. The Magpie, *Pica pica* (or *caudata*), and the Common Jay, *Garrulus glandarius*, belong also to the *Corvidae*,

as well as the Chough, *Pyrrhocorax graculus*, still resident in the British Islands, while the Nutcracker, *Nucifraga caryocatactes*, a bird varying much locally, is only a rare visitor to this country. In tropical countries *Corvidae* of very gaudy plumage are found, such as the American blue Crows, the Indian long-tailed *Urocissa*, *Cissa*, and others. The latter are beautifully green in life, but in collections this green is gradually altered to a somewhat dull blue, but if kept in the dark this process can be prevented for a long time.

The Birds of Paradise, *Paradiseidae*, are generally regarded as very close allies of the *Corvidae*, but they have been already mentioned in Case II. (see p. 25).

Not far from the *Corvidae* stand also the Starlings, *Sturnidae*, with a single British representative, *Sturnus vulgaris*, but a good many subspecies of the latter and species in foreign countries, some, as the African Glossy Starlings (*Cosmopsarus*, *Lamprocolius*, *Lamprotornis*), being of brilliant metallic colours.

The *Pastor roseus* is only an irregular visitor to Great Britain.

In America the Starlings are not represented at all, but their place in nature is evidently taken by the "Hang-nests," *Icteridae*, which build enormous long tubes in which their eggs are deposited.

This case contains also the Shrikes, a family very rich in species in the Old World, but very poorly represented in America; there are only five species

which have occurred in the British Isles. They are :—

Pallas's Grey Shrike, *Lanius major*—a very doubtful species, of which we do not as yet know very much ; the Great Grey Shrike, *L. excubitor* ; the Lesser Grey Shrike, *L. minor*, which has never bred in England ; the Red-backed Shrike, *L. collurio*, by far the commonest ; and the rarer Woodchat-Shrike, *L. senator*. Of the Great Grey Shrike an albino is to be seen, I believe one of the rarest albinos among British birds.

In this case we see also the Waxwing, *Bombycilla garrula*, or *Ampelis garrulus*, a bird which nests in Lappland, but visits England only in irregular intervals in winter, being a more regular winter bird in the northern parts of Germany. Pale and almost quite white varieties are here, which are extremely rare in this bird. The Waxwing leads us to the great family of Flycatchers, plentiful again in warmer climates, but only two species of which inhabit the British Islands, the Spotted Flycatcher, *Muscicapa grisola*, common everywhere, and the far less numerous Pied Flycatcher, *M. atricapilla* ; while a third very pretty species, the little Red-breasted Flycatcher, *M. parva*, similar to a diminutive Robin, is only an exceedingly rare straggler.

Here also are the Swallows, of British species three, *i.e.* the Common Swallow (*Hirundo rustica*), the Martin (*Chelidonaria urbica*), and the Sand-Martin

(*Cotile riparia*), and a good many albinos. The American Purple Martin is said to have occurred as a straggler in Ireland. In this case are also the Orioles, with many tropical species in the Old World, though absent from America, but only known in Europe from the Golden Oriole (*Oriolus galbula*), and the Pittas and Broadbills. The *Pittidae* are essentially oriental birds, none being found in Europe or America, and only one in Africa. They belong to the Passeres, but not to the *Oscines*, to which all our English Passeres belong, on account of the formation of their vocal organs. The *Pittidae* are very short-tailed, and mostly of brilliant colours. They build open nests, and lay white or cream-coloured spotted eggs. A similar position in the system is taken by the Broadbills (*Eurylaemidae*), a family only found in the oriental region, also of gay colours and laying spotted eggs in closed nests hanging on trees.

A few other tropical families of birds are also represented here: the Manakins or *Pipridae*, peculiar to the neotropical region, generally exhibiting rich tints of blue, red, orange, yellow, white, black, or green; the *Cotingidae* (with the Cock of the Rock, *Rupicola*); the *Campephagidae* or Woolbacks of the Old World; and the *Dacnidae*.

Bird Case VI.

On the top are the large Hornbills (*Bucerotidae*), a family inhabiting only the tropical forests of Africa

and the oriental region as far as New Guinea and adjacent islands. A good selection of species is here exhibited. These birds have a peculiar habit: the female lays white eggs in a hollow tree, and the male with her aid plasters up the entrance with mud, leaving only a small hole through which she receives the food brought to her by her mate, and she is not released until the young are hatched. They have received their English name from extraordinary horn-like excrescences developed on the bill in many species, these "horns" being hollow and very thin in most cases, but solid and hard as ivory in one singular species. Just below the Hornbills, the Touracos or Plantain-Eaters (*Musophagidae*) are placed, a fruit-eating family entirely confined to the African forests, and noted for their beauty. The crimson colour of the wing-feathers which is found in many species has the peculiarity that it is washed out by water, and reappears after some time.

Below these fine birds we find again more familiar ones: the Larks (*Alaudidae*), among them all British species, and very fine isabelline and spotted varieties, as well as total albinos and the ugly blackish form which is sometimes developed in captivity, if the influence of the sun and fresh air and proper insect-food are wanting, and the birds receive much hemp-seed. Under the Larks we see the great family of Finches or *Fringillidae*, and the closely allied tropical Weaver-Birds (*Ploceidae*), as well as their

very similar American cousins, the Tanagers (*Tanagridae*). None of the latter two families are found in Europe, while among the *Fringillidae* we meet a great many of our most common and familiar birds, such as the Sparrows and Finches, as well as the Buntings and Yellowhammers. Many extraordinary varieties and albinos are here. Special attention might be called to the Bullfinches. We see here not only the small Western, but also the larger Eastern species (or rather subspecies), also albinos of extraordinary beauty and a real hermaphrodite, showing on one side the colours of the male, on the other those of the female. The black variety, produced in cages, generally from excess of hemp-seed, similar to the one of the Skylark, is also to be seen. On side-brackets we find some Sun-Birds or *Nectariniidae*, from the tropical regions of the Old World.

The next case,

Bird Case VII.,

the corner case, contains a great assemblage of "Picarian birds." The Cuckoos, *Cuculidae*, consist of two natural groups—the *Cuculinae*, which are nearly all parasitic, *viz.* lay their eggs in the nests of other birds and do not hatch them themselves, and the *Centropinae*, which are non-parasitic. These latter birds are, nevertheless, very interesting in many other ways ; for example, the female *Centropus* is the larger and stronger bird, and does the "singing," as

well as other duties. These facts, however, are not sufficiently studied; but a parallel case is known to occur in the *Turnicidae*, or Hemipodes, a group of tiny Game Birds.

Of the family *Cuculidae* only one is a true British bird, our Common Cuckoo, *Cuculus canorus*; while examples of the Great Spotted Cuckoo, *Coccytes glandarius*, and the American Yellow-billed Cuckoo, *Coccyzus americanus*, as well as the Black-billed Cuckoo, *C. erythrophthalmus*, have been shot in the British Islands; but such cases are very rare, and, with exception of the first, probably due to human assistance.

The Woodpeckers, *Picidae*, are below the Cuckoos. The British species, the Black, Spotted, Green Woodpeckers, are well represented. Varieties and albinos are rather rare in this family, but a pale isabelline variety of the Continental *Picus canus* is to be seen.

The Parrots, an entirely tropical family, are absent from Europe, but well known to everybody from being frequently kept alive. Many species are chiefly of green plumage, and it is remarkable that their albinos are not white, but sulphur-yellow! This seems to be a general law among green birds, for Mr. Rothschild has also received a yellow albino of a green *Himatione* from the Sandwich Islands; while, on the other hand, albinos of the grey West African Parrot are white! The Toucans, *Rhamphastidae*, are all South American, and easily known by their enormous but thin, light, and hollow bills. The Barbets

or *Capitonidae*, among them the well-known "Coppersmith," *Xantholaema indica* of India, are also represented.

Bird Case VIII.

contains the **Pigeons, Sandgrouse, Partridges, Francolins, and Quails.**

The Pigeons are a very large family, spread practically all over the world, and often of very gay colours. In Great Britain we have, putting aside the numerous races of the Domestic Pigeon, the large Wood-Pigeon (*Columba palumbus*), the Stock-Dove (*C. oenas*), the Rock-Dove (*C. livia*), and the pretty little Turtle-Dove (*Turtur turtur*). The Sandgrouse forms a link between the Pigeons and the Game Birds. Among the generally very beautiful Sandgrouse is Pallas's Sandgrouse, *Syrrhaptes paradoxus*, best known to the British public on account of its occasional extraordinary wanderings over Europe. This bird inhabits the sandy steppes of Inner Asia, but now and then leaves its desert home in enormous numbers, invading not only Central Europe, but spreading, though not in numbers, as far north as Norway and as far south as Spain; while England has, in 1859, 1863, 1864, 1872, 1876, and 1889, been visited by great numbers, one unfortunate bird even wandering as far as the outer Hebrides. These irruptions are comparable with those of the Lemming, and, like the Lemmings, which perish to the last, the

wanderers lose their lives sooner or later. It has been suggested that they would have survived if they had not been shot down, but such an idea seems absurd, as the climate and nature of the British Islands is far different from that of Central Asia.

The Common Partridge, *Perdix perdix* or *P. cinerea*, is exhibited in a great number of varieties, some, like the chestnut ones and the Russian silvery grey ones, being of exceeding beauty and rarity for a lover of aberrations. Total albinos are more common among these birds. The (mostly African or Indian) Francolins, *Francolinus*, are close allies to the Partridges, and the Quail may, *cum grano salis*, be called a diminutive *Perdix*. Attention may be called to the pretty group of the Quail with its downy young. The pretty Quail has of late years unfortunately become much rarer both in England and in Germany. The enthusiastic "bird-preserved" and the public in general have soon been ready to ascribe this diminution to the destruction of great quantities of Quails in the countries of the Mediterranean; but those who know more of nature and the conditions of bird-life have understood that—as in most cases—not the "murdering in the south," but our own countries with their changed conditions, the (for the zoologist!) unfortunate drainage, high farming, and cultivation, are the root of the evil.

Turning round we face, opposite to the Partridge case, a large corner case, in which, on the narrow side

as well as on the long one, along the passage through which we came and through which we will now return, we see the

Game Birds

displayed. The collection of *Tetraonidae* is probably the finest in the world, especially with regard to hybrids and varieties, which are very frequent in this group of birds, on account of their polygamous habits. The sportsman will be delighted to view this magnificent series, but by far the larger number is kept in skins in the rooms containing material for study. The rarest of the hybrids are supposed to be the hybrid between the Blackcock and Hazel-Grouse, and the hybrids of Pheasant and Capercaillie, Pheasant and Blackcock, Willow-Grouse and Blackgame, and others. Most of the greatest rarities and finest specimens are from Russia and Siberia, others from Scotland. The "Rackelhahn," or the male offspring of the pairing of Blackgame and Capercaillie, is the least rare of all these hybrids. The British representative of the Willow-Grouse (*Lagopus albus*) is the Red Grouse (*Lagopus scoticus*), the celebrated Scotch game bird of the moorlands, one of the most famous game birds both for shooting and eating, now successfully introduced into the Eifel Mountains in West Germany and into South Sweden.

The following case, No. II. on this side, is a continuation of the Game Birds, containing the

Pheasants,

among them the long-tailed Reeve's Pheasant, *P. reevesi*, to a small extent introduced to the coverts of England, the splendid *P. mongolicus*, and others. We see in this case also the nearest allies of the Pheasants, such as the Monals, *Lophophorus*, of the Indian mountains, and others, the Gold and Silver Pheasants having partly been passed already in the former case. Here too are many extraordinary hybrids.

Case III. on this side

contains the Bustards, with only one real British species, the Great Bustard, *Otis tarda*, now extirpated in Great Britain, since the extension of high cultivation, greater population, and the introduction of improved agricultural implements, such as the various steam-engines, corn-drills, horse-hoes, and others, made the country unfitted for this large bird with its shy nature, every one of their big nests being now easily discovered and generally destroyed, seeing that they used to breed in the widely extended fields of winter corn. The Little Bustard, *Otis tetrax*, was never more than a straggler to the British Islands, and *O. macqueeni* has been shot once.

Besides the Bustards, we see here the Ibis, Cranes, and Plovers, among them the much-esteemed Golden Plover and our familiar Common Plover, Lapwing, or Pewit, *Vanellus vanellus*, of which rare and interesting

varieties are shown, and the rest of the large family of *Charadriidae* or Plovers, so well known to all inhabitants of the coast-districts, where they are found in enormous numbers, and often test the ingenuity of the sportsmen, on account of their shyness, but naturally less known inland, although occurring everywhere where there is water.

A remarkably beautiful and fine albino is the completely white Curlew, *Numenius arquatus*.

The next case, the corner case on this side, contains the subclass

Ratitae,

or the Ostriches and Ostrich-like birds. This case is remarkable for the preparation of the Cassowaries. These are modelled and coloured from sketches and photographs taken from living specimens, and most of the specimens have been kept alive before they were mounted. This is probably the first museum in which this course is followed. Some of the Cassowaries are also very rare species. A striking object also is the towering cast of a skeleton of the extinct gigantic Moa of New Zealand, together with several real skeletons of smaller species of Moa, among them the most complete Moa-skeleton known, and the skeleton of an *Aepyornis* from Madagascar, two eggs of which are also exhibited. The Emus (*Dromaeus*) belong to the same group as the Cassowaries, agreeing with them in many characteristics, such as the absence

of wings—a few bare shafts being visible on the Cassowary's wing—the apparent duplication of each feather, the after-shaft or *hyporhachis* being as long as the main shaft, and others, but differ in having no helmet, no bare carunculated heads and necks, no formidable dagger-like claw to the inner toe. The Emus are inhabitants of Australia, and have, for some years, been bred successfully in Tring Park, as well as the Rheas (*Rhea americana*), the American Ostriches, which agree with the true African Ostriches (*Struthio*) in having well-developed wings—although, of course, incapable of flight—broad, soft feathers, and in some other points. All these are exhibited in this case, as well as the eggs and young.

The next case in the centre passage contains the

Storks, Herons, Rails, and Divers,

also the **Woodcocks** and **Snipes**, for which there was no room among the *Charadriidae*, which are on the other side of this cabinet. Of the Woodcocks there are some very beautiful varieties, as also of the Snipes, the prettiest one of which is a Russian specimen with an extraordinary spotted upperside. There is also the dark variety which occurs, apparently, only in the British Islands, and mostly in Ireland, known as Sabine's Snipe and for a long time considered to form a distinct species.

Among the Rails or *Rallidae* we find our well-known Coot (*Fulica atra*), an albino of the Moorhen (*Gallinula chloropus*), Land-Rail (*Crex crex* or *pratensis*), the Water-Rail (*Rallus aquaticus*) and a perfect albino of the latter, the tiny Little Crakes and Spotted Crake, as well as some exotic forms. The rarest of these is the now extinct Sandwich Island Rail (*Pennula ecaudata* in *Cat. B.* XXIII. p. 114), and the little Laysan Rail (*Porzanula palmeri*), which has been discovered on the little island of Laysan in the North Pacific Ocean by Mr. Rothschild's collector Henry Palmer.

Among the Divers we find our British species, as also among the Grebes, of which the Great Crested Grebe (*Podiceps cristatus*) breeds frequently on Tring Reservoirs.

The following case acquaints us with the

Swans, Geese, and Ducks.

Among the Ducks we find some hybrids, and an adult male as well as a young male of the extinct Labrador Duck (*Camptolaimus labradoricus*) of North America, a bird which is, like most other extinct birds, much rarer in collections and less known than the Great Auk, about which so much has been written and for which such high prices have been paid in England. A specimen of this Great Auk (*Alca impennis*) is to be seen in the following case, the last of the bird

cases, together with casts of its egg. This case contains, in addition to the

Auks and Guillemots, the Penguins, Albatrosses, Gannets, Cormorants, Skuas, Gulls, and Terns.

Of the Penguins the enormous Emperor Penguin (*Aptenodytes forsteri*) is worth special attention, and among the Auks and Guillemots we see a black variety (melanism) of both the Razor-Bill (*Alca torda*) and the Common Guillemot (*Uria troile*).

Returning through the centre passage to the entrance, we see in front—a little to the left—a glass case with

Nests.

This is still in preparation, but it will contain, or contains already, most of the different types of nests. The simplest method is to merely lay the eggs on the bare rock (Guillemots), then a little impression is used or made in the sand or soil, in the next stage this is lined with some grasses or leaves. A more advanced form is then the nest of the Wood-Pigeon, consisting of sticks laid across some branches or twigs; then the nest becomes thicker, softer, until the beautifully soft woven nest of the Chaffinch and others is reached, while the Thrushes plaster it out with mud or clay and decayed wood. This is the beginning of the plastering, which is more developed in the Swallow

and Martin, which build entirely of mud, lined with soft material. Other birds build closed nests, with a small entrance hole, in our country especially the Long-tailed Titmouse and the Wren, while some birds suspend their nests in a more or less artificial manner. A curious nest is the one of the Tailor-Bird, which actually sews some leaves together with cotton and builds a nest between these.

Still more remarkable are the nests of the Swifts, as they are fixed with the birds' saliva; and those of the Swiftlets (*Collocalia*) are entirely built of dried spittle—and eaten as great delicacies by the Chinese and many others. The nests of the *Macropteryx*, a Swift, and the *Batrachostomus*, a Frogmouth—allied to the Nightjars—are also worth special attention, being small cups or soft pads, attached to the side of a stem or twig, and containing one single white egg, which is incubated by the parent warming it with its belly while sitting across the bough. The variety of forms of nests and their adaptation to surroundings and circumstances are of endless interest.

On ascending the staircase we may look at the photographs, taken from life, of the Kiwis, Manis, and Giant Land Tortoises, the horns of some Deer, and some huge fossils; but we must not forget to look high up to see the monstrous Snakes suspended from the walls, the large *Python reticulatus* measuring 23 feet, and the fine heads of the Indian Wild Buffalo or Water-Buffalo (*Bubalus bubalis*) from

Assam. There is also to be seen on the staircase the cast of the *Archaeopteryx*, the oldest bird-remains as yet known, belonging to an animal very different from the birds of our days. On the top of the staircase we see an octagonal glass case, with a magnificent collection of

Humming Birds (Trochilidae).

This collection was entirely formed by Mr. O. T. Baron, a railway engineer, who, during his travels in Mexico and California, and afterwards in Ecuador, shot and mounted these pretty birds on the spot, thus producing real works of art, by mounting them in the position in which they were seen by the observer, standing in contrast to all formerly mounted collections of Humming Birds, which were mostly mounted from dry skins and without the slightest idea of their real positions on the part of the taxidermist. Another collection was afterwards formed by Mr. Baron in the Andes of Peru, where he made a special collecting tour, during which he discovered many new species.

The Humming Birds have always attracted a good deal of attention, on account of their exceeding beauty, but nobody has, in our opinion, ever done such successful field-work in this group as Mr. Baron. It is, however, not only the beautiful plumage that makes the *Trochilidae* interesting, but

almost as much their variety in shape of bill, tail, and wings, and their pretty nests and fascinating habits. The bill differs much, varying from the enormous straight sword, equalling or exceeding the whole body in length, in *Docimastes ensifer*, to the short little needle in *Rhamphomicron* or *Schistes*, and from the semicircular curved beak of *Eutoxeres* to the longer curved one in *Phaethornis*. The tail varies from a short square one to the enormous forked tails of *Cyanolesbia*, *Lesbia*, and others, and to the pretty flags of *Prymnacantha* and *Discura*. While the tail is usually composed of ten soft feathers (never twelve), this number is greatly reduced in the most peculiar *Loddigesia mirabilis* from Peru, with its enormous flags, of which a whole family is here exhibited, and the rectrices are stiffened and enarrated in *Myrmia* and others. The wings, in contrast to the generally gay plumage of the body, are generally dull brown or dull purplish brown, but in a few forms they are highly coloured, so in *Lamprolaema rhami* they are chestnut, in *Pterophanes temmincki* shining steel-blue. While the shafts of the primaries, though always strong and stiff, do not, as a rule, present any great peculiarities, they are widened to a great extent in *Campylopterus* and *Eupetomena*, and less so in a few allied genera. These broad sword-like shafts must be formidable weapons if used as such, and they most likely are, since the Humming Birds are extremely

pugnacious birds. Some genera, not having any of these peculiarities, have adornments in the form of elongated and glittering feathers on the head, or a long pendant or erect crest. Some have the tarsi bare; others, like *Eriocnemis*, possess beautiful silky puffs on their tarsi.

The Humming Birds are entirely restricted to America, being most plentiful in the mountain-ranges within the tropics, while a few reach far up north in North America. Their food consists of insects and nectar. The number of eggs is always two, and their colour is always a glossless white. About 500 species are known at present.

Leaving this fascinating case, we will proceed to the

Upper Gallery,

where, passing through the door, we perceive an enormous head, with tusks 9 ft. 3 in. long, of an African Elephant, shot by Mr. G. P. Walker. On our left we perceive again large cabinets.

The first of these contains the

Turtles and Tortoises,

with the exception of the Giant Land Tortoises, which we shall find in another place. Excelling in interest all the rest in this case is the enormous skull of a Matamata (*Chelys matamata*), which must have belonged to an animal of quite abnormal

dimensions. Also a skull of *Dermochelys imbricata*, which was found washed ashore near Aden, is one of a very large specimen.

The following case, No. II. in the gallery, gives an idea of the

Crocodiles, Monitors,

and a few other large lizards. The Monitors (*Varanus*) are some of the largest lizards of our days.

Case III. contains the

Poisonous Snakes

and more lizards. Among the latter the rather primitive Tuatara or Sphenodon from New Zealand, which is now almost extinct, calls for special attention, as well as the peculiar Frilled Lizard (*Chlamydosaurus kingi*) from Australia; and the only known poisonous lizard, the so-called "Horror" (*Heloderma suspectum*), from Arizona.

Case IV.

displays the harmless Snakes.

Case V.,

a continuation of the Snakes, is not finally arranged, nor is

Case VI.

In this case the Amphibians will be exhibited. At present we may here admire an enormous Wasps' nest, found at Watford, surpassing in size all others known to us. In this case, however, the Fishes commence, and we are at once attracted by some Sharks (*Selachoides*), and especially by the Spinous Shark (*Echinorhinus spinosus*), whose body is covered with round tubercles—a ground-shark, but very rarely captured in British waters. A remarkable form is also the Hammerhead (*Zygaena malleus*).

The following case contains the

Rays (Batoidei).

Of these the most interesting are the Torpedo-Rays, also called "Cramp-fish" or "Numb-fish." One of these, *Torpedo hebetans*, is not uncommon in our deeper waters, and it has, like its congeners, the power of giving electric shocks of considerable strength—a power which ceases with life. The electric organ consists of a battery of between four and five hundred hexagonal prisms of cells containing a gelatinous substance.

We now pass through the open doorway and are in the

Zebra Room.

Here are mounted examples of most species and races of Zebras, from the now fully extinct Quagga (*Equus quagga*), the beautiful Mountain Zebra (*E. zebra*), now only to be found in preserved places, to the better known *Equus burchelli*, *Equus chapmani*, and others of that group, as well as the large Somaliland Zebra (*E. grevyi*). Also a Wild Ass from Somaliland and the rare Kiang (*Equus hemionus*) are to be seen.

In the middle of this room we find a case with

Pigs (Suidae).

Among these we find *Sus* proper, the Wild Boar (*S. scrofa*), the ancestor, or at least one of the ancestors, of our domestic Pigs. More interesting, though not better-looking, are the Wart-Hog (*Phacochoerus*) of Africa, the Babirusa (*B. alfurus*) of Celebes, and the very rare (in collections) *Potamochoerus edwardsi* of Madagascar; while in *Dicotyles* of South America and *Porcula salvania* of the Himalayan Terai forests we find more diminutive forms.

Another case displays a large individual of *Budorcas taxicolor sinensis*, a geographical race of the Takin from the Mishmi Hills, north of Assam, and this brings us to the

Antelopes.

In the same case we see the Alpine Chamois (*Rupicapra tragus*), together with several species of *Nemorhoedus*, a group of very goatlike-looking Antelopes of the mountains of the more eastern parts of Asia, and the *Saiga* with its high curved nose. A near ally of *Nemorhoedus* is the Rocky Mountain Goat of the Americans, *Haploceros montanus*, which looks, indeed, still more like a goat.

The other large case in this room contains the Gnus (*Connochaetes*) in several species, and some other Antelopes, notably the fine Waterbuck named by Mr. Rothschild *Cobus penricei*, and the rare *Addax nasomaculatus* from the Sahara.

Turning back and approaching the spiral staircase, we pass a small case in which we see a beautiful mounted Sea-Otter (*Latax lutris*), noted for its valuable fur. Ascending the spiral staircase, we reach the

Antelope Room,

in which we see a very fine collection of Antelopes, consisting partly of entire mounted animals, partly only of heads, skulls, and horns. A good look over this collection is especially recommended, and we will only call special attention to the fine Bontebok (*Alcelaphus pygargus*) and the huge Eland. At the farther end of this little room we see an enormous Bear, allied to the Grizzly, from Alaska, called

Ursus dalli by American zoologists. Close to the window in this room is also a mahogany cabinet, containing all British Shells on one side, and the eggs of all Birds regularly breeding in the British Islands, and a few others besides. Visitors are requested to pull the drawers out gently.

Descending the staircase, we come again to the

Fishes.

The first case to the left contains the enormous Giant Florida Perch, the peculiar American "Bony Pike" (*Lepidosteus platystomus*), known for its completely ossified skeleton, the "Spoon-billed Sturgeon" (*Polydon folium*), also from America, and the beautiful Opah (*Lampris luna*). The next case shows on the top an enormous fish from British Guiana, the *Arapaima gigas*, the largest fresh-water *Teleostean*, reaching sometimes a length of 15 feet, and being excellent for food. The Maigre (*Sciaena aquila*) is very rare on the English coasts. In the following case we are attracted by a fine Swordfish (*Xiphias gladius*) caught near Folkestone, as well as the Bonitos.

The next two cases contain a number of mostly British fishes, one of the finest in colours being the Blue Wrasse (*Labrus mixtus*), others the well-known Turbot (*Rhombus maximus*) and the large Halibut (*Hippoglossus vulgaris*).

In the following one we make the acquaintance of the Tarpon (*Megalops thrissoides*), a gigantic fish of the

Herring group, and we also see the Salmon and Pike (some large specimens of the latter from Tring Reservoirs). Of more interest, however, is the peculiar Silvery Hair-tail (*Trichiurus lepturus*), and the Scabbard-fish or "Frost-fish" of the New Zealand colonists (*Lepidopus caudatus*), a deep-sea fish, said to come ashore on frosty nights, and being much valued for the table. This species is widely spread, and has even occurred on the southern shores of England.

We are now coming to the last fish case, in which a number of fishes of most peculiar outward appearance are on view, as well as others of most singular internal structure. The former are the Plectognathous fishes, such as the File-fishes (*Balistes*), the Trunk-fishes (*Ostracion*), the Balloon-fishes (*Tetrodon*), and also the gigantic Sunfish (*Orthogoriscus mola*), of which a far larger specimen is suspended opposite the Halibuts. Of special interest on account of their anatomy are the *Dipnoi*, fishes which have lungs as well as gills. Of these the best known is perhaps the "Lepidosiren" (*Protopterus annectens*), which is very common on the West Coast of Africa. This fish passes the dry season sleeping in the mud, if living in ponds which disappear after the rains. Another much rarer fish of this suborder is the true South American Lepidosiren (*L. paradoxa*), a magnificent specimen of which is to be seen in a glass tube. This was brought home from Paraguay by Dr. Bohls, who captured a great many specimens, while formerly they were the

greatest desiderata of zoological collections. Dr. Goeldi afterwards received specimens from many parts of Amazonia.

Another most interesting form of the Lung-fishes is the "Barramuda" or *Ceratodus*, the discovery and description of which does not date further back than 1870. Both species, *Ceratodus forsteri* and *C. miolepis*, from the rivers of Queensland, are on view.

The next two cases contain

Echinodermata, Corals, Shells, Sponges,

and others, but they are not yet arranged. Special attention may be called to the enormous red *Paragorgia arborea* from the sea near the Norwegian coast, and the Giant Crab (*Macrocheira kaempferi*), the largest Crustacean, on the top of the second case. Close to this we find a small mahogany case with drawers containing a collection of all Macrolepidoptera, Butterflies as well as Moths, known to occur in Great Britain. Species of which the right to be called British is doubtful have red labels. On the top of this case an entire very large nest of the Hornet (*Vespa crabro*), taken at Watford, is on view.

We must now turn back again and face the centre, as we have so far only looked at the side-cases. We now see right in front of us long rows of yellow pine-boxes, in which a small number of the in-

numerable forms of *Invertebrata* are exhibited, chiefly the jointed animals or *Arthropoda*. These boxes are not all finally arranged, but the following points may be mentioned as specially interesting.

Opposite to the fishes we find a great number of

Crustaceans.

Of these the King-Crabs (*Gigantostroma*) occupy a very isolated and singular position. The *Limulus* has an enormous carapace, and very long spines projecting from the abdomen and carapace, and a long tail, which it uses as a prop when moving about. In May and June they approach the coast in couples to spawn.

Among the true Crustaceans we find the well-known Lobster, Crayfish, Prawns, Shrimps, and Crabs, as well as the Barnacles. Of more than passing interest even to an amateur are the Hermit-Crabs (*Paguridae*), which abound in all seas. They have a very soft abdomen, and, aware of their defencelessness, always occupy empty shells, which they do not leave again, except to change them for larger ones, as they grow. In many cases a remarkable symbiosis, or friendship, is observed, with a kind of anemone, which seems to share the meals of the Crab, and also must necessarily be a protection, as it is most distasteful and burning to all fish and other enemies. Several species of Hermit-Crabs have forsaken the sea and spend most of their lives on land; for example, the genus *Cenobita*, which

frequents the West Indian Islands. Remarkable for its size, when full grown, is the Cocoanut-Crab (*Birgus latro*), which inhabits the Indo-Pacific islands, and lives chiefly upon the cocoanuts which fall from the palms.

Centipedes, Millipedes, Scorpions, and Spiders

will be found on the farther side, among the first an enormous Venezuelan specimen and very large Scorpions.

The

Beetles (Coleoptera)

follow next, beginning with the predaceous Tiger-Beetles, *Cicindelidae*, speedy on the wing as well as on foot, and the *Carabidae*, also more or less carnivorous, and very numerous in temperate zones. The most aberrant form of *Carabidae* is the *Mormolyce phyllodes* of the Malayan countries, called by the natives in Java "the violin" on account of its curious shape. *Zabrus gibbus* is addicted to vegetable diet, an exception among the *Carabidae*. The Water-Beetles consist of several groups, the carnivorous and swift *Dytiscidae*, the pretty Whirligig-Beetles, *Gyrinus*, and the herbivorous crawling *Hydrophilidae*, rather distantly related to the other Water-Beetles. The series of *Coleoptera* exhibited ends with the Longicorns, a family of innumerable species within

the tropics, and the Phytophagous *Chrysomelidae* and *Coccinellidae*, our familiar "Lady-birds."

Leaving the Beetles, we come to the *Hymenoptera*, *i.e.* the Wasps, Bees, Ants, about which a series of twenty volumes could be written very easily, but which we are obliged to leave to the mercy of the visitor, for want of space, and so we must the *Diptera*, *i.e.* the Flies, and the *Neuroptera*, among which are the Ant-Lions.

The

Lepidoptera,

i.e. Butterflies and Moths, are shown in a number of boxes. Of this attractive order Mr. Rothschild possesses one of the largest collections in the world, no doubt the largest in England. The popular distinction between Butterflies and Moths is not a very deep-rooted scientific distinction, but very convenient. Of the former the *Morpho* of South America and other Morphids, and the *Ornithoptera* or Bird-winged Butterflies of the East, are among the largest and most brilliantly coloured ones, though some of the small *Lycaenidae* ("Blues") and others equal them in beauty. Of the Moths the large *Saturnidae*, or Silk-producing Moths, now bred freely in Europe by many amateurs, and always on view in the insect house in the gardens of the Zoological Society in London, are the best known and, with a few exceptions, the largest Moths.

Next follow the

Rhynchota.

Some of these, like the *Flatinae* and several of the "Lantern-Flies," *Fulgora*, rival the Butterflies in the brilliancy of their colours, while others, the *Cicadidae*, are famous for the noise they produce, which in a Venezuelan species is as loud as and as similar to the whistle of a railway engine as it can possibly be. The males only produce the "song," the females being without the sound-producing apparatus. The *Fulgora* or Lantern-Flies were believed formerly to possess luminous properties, but modern observers have not confirmed this. To this order of insects belongs also our European Water-Scorpion, *Nepa cinerea*, and a number of gigantic American *Nepae*. These fly well and are often attracted by the light, a fact from which they have received the name "Electric-light Bug." Other more objectionable members of this order are the Bed-Bug, *Cimex lectularius*, and the Phylloxera of the vine.

The order

Orthoptera

includes the *Pseudoneuroptera*, *i.e.* the Dragon-Flies, May-Flies, White Ants (*Termes*), and the true *Orthoptera*, *i.e.* the Grasshoppers, Locusts, Crickets, Cockroaches, and allies.

Among the Locusts we find the Migratory Locust

(*Pachytylus migratorius*), known from its migrations in countless numbers, during which they destroy all vegetable life in the places they reach. There are also in this order the wonderful Leaf- and Stick-Insects (*Phasmatidae*), most interesting on account of their resemblance in form and colour to twigs and leaves, some being wingless, others well able to fly. A good number are here exhibited.

It remains now to glance at the large animals standing on the top of the cases and suspended from the roof.

Beginning again at the entrance door to the gallery, we see on the cabinets a fine Malayan Tapir (*Tapirus malayanus*), which is perhaps the finest specimen in any museum. Then we see towering upwards a cast of the skeleton of the extinct Giant Ground-Sloth (*Megatherium americanum*), made from the specimen in Madrid (the one on which Victor Scheffel made his famous poem) and the one in the possession of the Royal College of Surgeons. Then we come to a Sumatran Rhinoceros (*Ceratorhinus sumatrensis*), and above it an enormous example of a

Ribbon-Fish (*Regalecus argenteus*)

of over 15 feet in length, its greatest thickness, however, being only three inches. This remarkable specimen was taken near Dunedin, New Zealand, by Mr. Sullivan, to whom it had been reported as a "Sea-Serpent." Mr. Sullivan had it placed in the cold

room of a vessel carrying frozen meat to London, and thus it reached England safely and has now been mounted by Mr. Gerrard. Longer specimens of an allied species have been taken, but none in a condition good enough to mount. In the same case is an example of the British species Banks' Oar-Fish (*Regalecus banksi*), caught on the British coast.

Next we see a magnificent Sea-Lion, *Otaria ursina*, the cast of the fossil *Glyptodon* from Argentina, and above it a large Walrus. On the other side are rare Seals—the Grey Seal, *Halichoerus grypus*, caught on the English coast, and the Monk-Seal, *Monachus albiventer*, from the Mediterranean. Then passing a Giraffe, we come to a collection of

Giant Land Tortoises.

Mr. Rothschild has for some time paid special attention to this group of animals, and his collection is unique. The largest specimen here exhibited for the present is one brought from the Galapagos by the late Dr. Baur; but much larger ones, from Aldabra and other islands, are kept alive in the Zoological Gardens at London. The interest in these gigantic Tortoises is somewhat melancholy, as their days, at least in a wild state, seem to be numbered. Their distribution at the present day is a problem that has not its equal, for they are now only living on the Galapagos group, west of Peru, and on the little

island of Aldabra, north of Madagascar. Enormous quantities have been carried away from the Galapagos for food, and they have long ago been exterminated in Mauritius and on other islands.

The last corner is taken up by the famous

“White” Rhinoceros,

distinguished from the ordinary or “Black” African Rhinoceros by its square mouth. This animal formerly inhabited the South African steppes in great numbers, but now only a small herd is said to exist in Mashonaland. No specimen was preserved in any museum in England before this one was shot for Mr. Rothschild by Mr. Coryndon.

Of the specimens suspended from the roof the most noticeable are a complete skeleton and mounted example of

Sowerby’s Whale (*Mesoplodon bidens*),

obtained at Cromer; a Florida Manatee (*Manatus latirostris*), of a large size, and its skeleton; a Greenland Shark (*Laemargus borealis*); Bottlenosed Dolphin (*Tursiops tursio*), from Folkestone; several Sharks, Sawfishes, Crocodiles, and others.

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HAZELL, WATSON, AND VINEY, LIMITED,
LONDON AND AYLESBURY.



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