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London
Birds
AND
Beasts.

—
J. T.
TRISTRAM-
VALENTINE,
FLS., FZS.

187m

Professor J. H. Pollen

London Aug. 14 1895.

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LONDON

BIRDS AND BEASTS.

BY

J. T. TRISTRAM-VALENTINE, F.L.S., F.Z.S.

(Member of the British Ornithologists' Union.)

WITH A PREFACE

BY

FRANK E. BEDDARD, F.R.S.

LONDON:

HORACE COX

WINDSOR HOUSE, BREAM'S BUILDINGS, E.C.

—
1895.

M366678

Birds

LONDON
PRINTED BY HORACE COX, WINDSOR HOUSE, BREAM'S
BUILDINGS, E.C.

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PREFACE.

THE reader of the following pages will doubtless remind the writer of the present lines that good wine needs no bush. As, however, the authorship of the articles from the *Saturday Review* was only known to a few friends and acquaintances, it appeared desirable that they should be prefaced in the book form by someone interested in the matters of which they treat, and, as so many of them relate to the animals at the Zoological Society's Gardens, I was asked by the author's friends to say a few words by way of an introduction to these essays of Mr. Tristram-Valentine.

The first set of sketches deals with animals at the Zoological Gardens. When they appeared in the *Saturday Review*, they were *à propos* of recent acquisitions; but it will be seen that they are of more than temporary value as short essays upon the animals in question. Moreover a large percentage of them relates to creatures that are generally included in the collection of living animals at the Regent's Park. At the moment of writing there happens to be neither an Aurochs

nor a leaf insect; but nearly all the other animals, particularly vertebrate, are now on view, and in the summer probably many of the invertebrate types will be exhibited.

This volume, therefore, being of moderate dimensions, can be usefully carried by the visitor and studied with the animals before him. It speaks well for the care taken of animals by the Society that many of the individuals spoken of Mr. Tristram-Valentine are still with us. The *Cryptoprocta*, of which he wrote in December, 1890, is still alive and shows no signs of decay; the African rhinoceros only died after a prolonged residence in the gardens of over twenty years, in all probability the extreme span of life of this animal.

The articles which follow those upon the Zoological Society's collection deal with London birds. They will possibly surprise those who regard, as Mr. Tristram-Valentine suspects of many, the sparrow as the only indigenous bird of this metropolis. I am informed that, after the article on "Bird Life in London" was published (the last the author wrote), he found that there were still many flycatchers to be seen in London parks and gardens, and that during his last illness he obtained evidence of the breeding of a pair in Kensington. It is probable that many persons were astonished by the pair of magpies in the Regent's Park, which were genuine inhabitants thereof, and not escaped prisoners from the Zoological Gardens. The extraordinary number

of seagulls that have been seen this winter from London Bridge seems to surpass those noticed by Mr. Tristram-Valentine in March, 1888.

Some years ago a few gulls took up their abode during the winter in the large inclosure devoted to these birds at the Zoological Gardens, where they found abundant food. It is said that the same birds put in under stress of weather another winter. The list of London birds can be largely increased, as Mr. Tristram-Valentine points out, by the inclusion of migrants which stop here on their journeys to and fro the south. The Zoological Gardens is a favourite place wherein to make a temporary halt, the attraction being perhaps partly the food, and perhaps more due to the presence of individuals of the same species whose call note stops them in their flight.

FRANK E. BEDDARD.

*Zoological Society's Gardens,
Regent's Park,
February, 1895.*

THE COMPILER OF THESE
ESSAYS WISHES TO THANK THE
PROPRIETORS OF THE "SATURDAY REVIEW"
FOR THEIR COURTESY IN ALLOWING
THEM TO BE REPRINTED.

INTRODUCTION.

EVERY book published must of course stand or fall by its own merits and the verdict of the public ; but in the case of a book of this nature, made up as it is of articles written from time to time, without any settled connection made by the author, it is perhaps not impertinent for those who know the private history of the work to put forth an introduction pointing out matters of some public interest which would hardly be perceived from internal evidence.

From a purely " natural history " point of view it may be well to point out that the author was one of that valuable race, the sportsmen naturalists.

He enjoyed keenly a good day's shooting, and his greatest pleasure was to secure his bag by his knowledge of woodcraft, and of the habits of game birds. Every note in the present book is the result of personal observation, most of the material for the papers on " London Birds " having been picked up in his almost daily walk from Kensington to Westminster through the parks.

There is another point about the collected

papers which is perhaps well worthy of being made known. When Mr. Tristram-Valentine wrote "The London Sparrow" he had never attempted any form of literary composition. The result of his first attempt was, as may be imagined, that curious burlesque of journalistic commonplace which most beginners perpetrate; but, without losing heart, he rewrote that paper at least six times until his work took possible shape. From that moment, in the midst of the busy life of a London solicitor, the duties of home and friendship, he found time to work at the art of writing, to revive and continue his studies in scientific zoology and classification, and to blend with the whole another passion of his life, that for "quaint old books" as he loved to call them, the effect of which may be seen by anyone who cares to know how a man may become a successful writer by comparing "the London Sparrow" with say "Pharoe's Mouse."

GORDON WIGAN.

Marseilles, March, 1895.

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I.—NOTES FROM THE ZOO.

MAMMALIA.

APES.

(Feb. 16, 1889.)

THE Zoological Society have a singularly good collection of anthropoid apes in their Gardens at the present time, consisting of four specimens. The well-known bald-headed chimpanzee "Sally"; a young one of the same species (*Anthropopithecus calvus*) obtained in December last; a young common chimpanzee (*Anthropopithecus troglodytes*), which was presented to the Society in May 1888; and a silvery gibbon (*Hylobates leuciscus*), which has been in the Gardens since November, having also been presented to the Society; this, like the last two, is a young animal. It will thus be seen that two out of the three known genera of anthropoid apes are now represented; the third was so until quite recently by a young orang (*Simia satyrus*); this, however, was not the property of the Society, having only been placed in the collection "on deposit," and has, we regret to say,

been removed by its owners. These animals are not only of great interest to naturalists, especially "Sally" and her "younger sister," but are a source of never-ending amusement to the people who all day crowd the house in which they are confined.

To naturalists the bald-headed chimpanzees are specially interesting, as—though the species was described by Du Chaillu, who claimed to have discovered it, and named it *Troglodytes calvus*—no living specimen had been seen, in this country at least, until "Sally" was obtained in October 1883; and the young one, recently added to the collection, is only the second that has been brought to this country alive. Du Chaillu gave a very interesting account of this ape—the native name of which he tells us is Nshiego mbouvé; he describes it as building for itself a nest, or rather roof, under which to sleep, of leafy branches ingeniously tied with vines to the tree in which the nest is built, and adds, "The tying is done so neatly, and the roof is so well constructed that, until I saw the Nshiego actually occupying his habitation, I could scarce persuade myself that human hands had not built it." The material for the nests is, he tells us, gathered by both the male and female; but the former alone acts as builder, and the two do not occupy the same nest, or even tree, but have separate habitations not far apart. Du Chaillu obtained several specimens of this new ape, one of which is now in the British Museum;

but considerable doubt was expressed whether they were not simply varieties of the common chimpanzee. These doubts have, however, been set at rest by the acquisition of "Sally" and her "younger sister" and as the latter is of about the same age as the Society's specimen of the common chimpanzee, and is kept in the same cage, it is easy to compare them and we imagine that most persons will agree with Du Chaillu, who said:—"I was at once struck with the points of difference between it (the Nshiego) and the chimpanzee. Its great distinction was its bald head. This is its mark." There are, however, other very noticeable differences, not the least of these being the difference in colour of the faces of the two animals. The young bald-headed chimpanzee is at present dark brown, but will no doubt, should she arrive at maturity, become, like "Sally," perfectly coal black; for Du Chaillu tells us that the face of a young one he captured was "pure white—very white indeed—pallid, but as white as a white child's," though its mother was "as black as soot in the face"; and that the young are invariably light in colour, becoming darker as they arrive at maturity.

"Sally" has spent more than five years in Regent's Park, having been acquired by the Society in October, 1883, and is probably better known than any other inhabitant of the Gardens. There is a great deal that is quaintly human about her; but Dr. Brookes, a writer of the last century, went too far when he said of the chimpanzee that

"all the joints bear an exact resemblance to those of a man, insomuch that one egg cannot be more like unto another; the fingers, thumbs, and toes are an exact representation of those of a human creature, and he has calves in the same manner." She is very intelligent and well educated; so well educated, indeed, that one is apt to forget that many of her actions are not natural to her, but are the result of education. As a noticeable example, how many, we wonder, who see her fed are aware that she does not take her food in a perfectly natural manner? Yet if they observe the young and uneducated apes in the next cage they will see that, instead of lifting the tin containing their milky food to their mouths as she does, they stoop down and take the food from the tin on the ground.

"Sally" also uses a spoon with such dexterity that even this action seems natural to her, and, like the chimpanzee described by Dr. Brookes, she will, "when she has done drinking, wipe her mouth as carefully as any person whatever." Her education has, however, not been confined to table manners; in fact, they are among the least of her accomplishments, the greatest of which is that she is able to count up to five, picking up and handing to her keeper, without mistake, the number of straws that he may ask for. Her method of proceeding is curious, as she puts all the straws in her mouth, with the exception of the last one. For example, if she is asked for five, she puts four in

her mouth, picks up the fifth, and hands the whole number to her keeper. She can appreciate size as well as numbers, as is proved by the fact that she will at command pick up a long or short straw, or, when pieces of fruit of different sizes are placed before her, take the largest, the smallest, or the middle-sized piece, as directed by her keeper. She also has an idea of colour, or at least can distinguish between a light and dark straw; for being asked for a black straw, she will hunt in her litter until she finds a really dark one. These, though they by no means exhaust the list, are among the most wonderful of her accomplishments; but they are apparently not so appreciated by the public as such comparatively simple tricks as leaving her food untouched until told to take it, finding fruit in her keeper's pocket, or kissing or shaking hands with him through the bars of her cage—tricks which require comparatively little intelligence.

“Sally” would appear to be sufficiently advanced to have some crude ideas of sale and barter; for on one occasion a lady who was watching her had in her arms a suricate, and “Sally,” who is fond of rats, evidently mistook it for one, and desired to possess it, and to this end produced all her valuables, consisting of a piece of wood, a penny, and the tin from which she had just drunk her beef-tea and offered them one by one, evidently in exchange for the little beast, and her fury and indignation on finding her offers refused were most amusing.

It may here be mentioned that the bald-headed chimpanzee, unlike its cousin the common one, is fond of meat. Du Chaillu tells us that one he kept for some months "was very fond of boiled meat, particularly boiled fish, and was constantly picking bones he collected about the town." "Sally" will kill and eat a pigeon or a rat, while her "younger sister" is satisfied with a sparrow or other small bird, and, like Du Chaillu's pet, they both appreciate cooked meat. Neither of them has, however, so far as we are aware, acquired the pernicious taste for strong drink possessed by that animal.

"Sally's" cage is separated from that in which the three young apes are confined by a wooden partition, through the cracks in which she is fond of peeping at them. The action is wonderfully human; as indeed, is the jealousy with which she regards her keeper when he pays any attention to his young charges, and we have little doubt that it would fare badly with them were the partition removed. Though not so interesting as the adult and well-educated ape, the young ones are well worth a visit. They are in good health and full of spirits, and play with one another in a most amusing manner.

The chimpanzees have a certain quaint stolidity even in their most lively moments, and though evidently fond of fun and laughter—and that they do laugh, cannot, we imagine, be disputed—apparently recognise the gravity of life; while the

gibbon is the very spirit and essence of impish activity, bounding about her cage with perfectly marvellous agility and grace, now and then dropping on her two slow-moving companions, to their evident discomposure, and retreating with a bound before they have time to resent the intrusion, which, being much the larger and stronger, they would probably do in an extremely unpleasant manner were they able to catch her. It will be extremely interesting as time goes on to watch the education of the young chimpanzees—the gibbon, we imagine, will not be seriously taken in hand—and to discover which is the most intelligent (Du Chaillu expressed the opinion that the Nshiego was far more docile and intelligent than the chimpanzee); at present there appears to be little to choose between them. But the bald-headed chimpanzee is by far the most amiable; so much so, that while she and the gibbon live amicably together, the common chimpanzee has, except for some hours in the day while the keepers are present, to be confined by herself in part of the cage partitioned off for the purpose.

The weather that we have experienced since the beginning of the year has been singularly trying for animals born near the Equator, and little wonder could have been felt if the Society's apes had suffered from the fogs and frosts of the last six weeks; but so far from this being the case, they all appear to be in singularly good health—a fact which reflects the greatest credit on all

concerned in their management. The house in which they are kept is certainly not arranged, like the reptile-house, for example, with a view to the comfort of those who visit it, being the worst in the Gardens ; but that it is eminently fitted for its purpose is proved by the excellent health of its inmates. And we can only hope that if the Society build a new and more taking house for their anthropoid apes it may prove as well suited for its purpose as the present, from the visitor's point of view, particularly uncomfortable quarters.

THE MANATEE.

(May 4, 1889.)

A NOTABLE addition has lately been made to the Zoological Society's menagerie in the shape of a young manatee (*Manatus australis*) from Demerara. The little beast is a comparative baby, being, as is supposed, only about twelve months old, and is about 3 feet 6 inches long. It appears to be in excellent health, and has, we believe, increased considerably in bulk since its arrival in the Gardens in March. Its present habitation is one of the large glass tanks in the Reptile House ; an excellent place so far as the animal itself is concerned, but one which is apparently the cause of a great deal of mystification to many of the visitors, who imagine that, as it is in that house, it must be a reptile, and look upon it as a species of sea-serpent. So far as we are aware, only two specimens of the manatee have been exhibited alive in London, at all events in recent years, until the arrival of the one now in the Regent's Park. The first of these was obtained by the Zoological Society about fourteen years ago. It was, we believe, full grown, and lived for a short time in one of the tanks in the Gardens. The other belonged to Mr. Farini, and was exhibited by him at the Westminster

Aquarium. Both of these animals excited considerable interest at the time of their exhibition; and the present one will, from all appearances, be quite as popular as its predecessors. It is certainly well worth a visit, being a most quaint little beast. It is particularly well placed in its present tank in the Reptile House, as the light is good, and the tank is at a convenient height; and, as the water is changed every morning, it is so clear that all the animal's movements can be easily watched.

The manatee belongs to the order Sirenia, a small group of herbivorous aquatic mammalia, which now contains but two genera, the manatees and the dugongs—a third, the rhytina, or Northern Sea Cow, having been exterminated about a hundred years ago. The manatee is widely distributed, being found not only in tropical America, but also on the West Coast of Africa, frequenting the shallow bays, lagoons, and sheltered creeks of the coast, and ascending the rivers. Formerly these animals were said to have lived in innumerable shoals at the mouths of the rivers Orinoco and Amazon, and to have worked their way up them for hundreds of miles, and peopled the freshwater lakes connected with them; but unfortunately for the manatees their flesh is highly esteemed, and in consequence their numbers have been terribly reduced. As we have said, they are herbivorous, feeding entirely on aquatic vegetation, apparently preferring fresh-water plants.

The Sirenia are certainly not beautiful, and it says much for the imaginative powers of our ancestors that they could, as doubtless was the fact, have evolved so charming a figure as the mermaid out of such a clumsy, graceless animal as either the manatee or the dugong. Though not graceful, however, the manatee is a very curious animal, with many striking outward peculiarities, which will be noticed by any one examining the specimen at the Gardens. The body is compact and cylindrical, narrowing towards the tail, which is large, flat, and rounded, reminding one rather of an exaggerated beaver's tail, and, as in the whales, is placed horizontally. The head is round and clumsy in appearance, and can hardly be distinguished from the body by any neck; the eyes are exceedingly small and deep set, and are singularly wanting in expression; the ears are apparently wanting, being only two small fissures which penetrate the skin; the muzzle is large and fleshy, semi-circular in the upper part, in which the crescent-shaped valvular nostrils are placed, and is thickly set with short, stiff bristles. The mouth is most peculiar; the lips are lined with short, hard, very thick bristles, the upper lip, which is somewhat prehensile, being very full and cleft in the middle, while the jaws are furnished in front with horny plates upon the gums, the whole being specially adapted to the animal's method of feeding, which is most curious.

The food is taken between the divisions of the

upper lip, being held securely by the bristles, and is passed into the mouth by a backward movement of the lips, the process being repeated with considerable rapidity, and quaintly reminding the spectator of a gigantic caterpillar in the act of feeding. The fore limbs may be described as swimming-paws, and are very free in their movements, being, in fact, hands—four fingers and a thumb—covered with skin, like the flipper of a whale; the fingers, which are very flexible, can be felt through the skin, and are furnished in the adult with very small nails. These limbs are used, however, not only for swimming, but also to guide the food into the mouth, and, when so used, look much like a man's hand in a sailor's mitten, the joints being plainly visible. The manatee at the Zoo, when resting at the bottom of its tank, has a curious habit of crossing its hands under its chest, which gives it a most curious appearance. The skin, which is dark grey, is thick and coarse, and is sparsely covered with slender hairs. When full grown, the animal attains a length of about 12 feet.

The Society's manatee made the journey from Demerara to Regent's Park in a tank, and was lucky in escaping almost unhurt, in fact, with no worse injury than a slight abrasion of the flipper. It bears, however, a mark, apparently the result of a wound with either a spear or harpoon, which may possibly have been caused at the time of its capture, as certainly in days gone by these animals were

taken with the harpoon, and were said to "yield the sporter no small diversion ; for, after having a dart or harpoon struck into their side, with a long line and buoy fastened to it, they hold some time in play," and "many times they upset the boat in struggling." However this may be, the animal is now, as we have said, in excellent health, and is blest with a vigorous appetite, to satisfy which a large supply of lettuce and beetroot is required. It is particularly fond of the leaves of the former plant, which it devours greedily, and with which it is constantly supplied by its keeper. It is quiet and docile, not to say phlegmatic—a character said to be possessed in a notable degree by all its kind—and seems quite at home and comfortable in its tank, showing not the slightest sign of fear of the crowd of persons continually gathered in front of it. In the morning, when the water in the tank is drawn off, the keeper sponges it all over—a proceeding which it thoroughly appreciates. It cannot, however, be kept long out of water, as being perfectly helpless, it is liable to injure itself in its awkward movements. Its tank is furnished with a sloping log to enable it, should it so desire, to rest its head out of water ; but we believe that it never makes any use of this contrivance, though it is hard to conceive that it can obtain all the sleep necessary to it in snatches of two and a half minutes. Yet this is apparently the limit of its stay under water. It is amusing to watch the methodical manner in which the animal retires to

one particular corner of its tank, and, folding its flippers under it and closing its eyes, composes itself apparently for a long and comfortable sleep, which, however, never lasts more than two minutes and a half, at the expiration of which time it is forced to the surface for air. If, as we sincerely hope may be the case, it should live to attain to maturity, a new house will have to be provided for it, as it would certainly outgrow its present tank. As, however, the lives of all animals, especially tropical ones, in confinement are somewhat precarious, we would advise all our readers interested in natural history, who are able to do so, to lose no time in paying a visit to this interesting representative of a very old-world but steadily-diminishing race.

THE GAUR.

(Nov. 2, 1889.)

AN exceptionally important addition to the Zoological Society's collection has been made during the last week by the safe arrival in Regent's Park of a young Gaur (*Bos gaurus*) from Pahang, Malay Peninsula, presented by Sir Cecil C. Smith, K.C.M.G. This animal, which is the "bison" of Anglo-Indian sportsmen, is not only "new to the collection," but is the first of its kind that has been seen alive in Europe, and its arrival is viewed with more than ordinary interest, owing to the fact that it belongs to a race which is said to be of such an untamable disposition that no member of it has yet lived for any length of time in captivity, however young it may have been when captured.

The present animal is a young bull, presumably about two years old, and is one of a herd of gaurs taken in April last by the Sultan of Pahang, or, to be more correct, under his direction. We gather the following facts relating to the capture from an extremely interesting letter which appeared in the *Singapore Free Press* and in the *Field*, and which was apparently written by an eye-witness. It appears that the Sultan, having conceived the idea of capturing a herd of gaurs, chose for the site of

his undertaking a long narrow neck of land, skirted on three sides by the river, about a mile in length and half a mile wide at its junction with the mainland, which was known to be a favourite resort of a herd of these animals, which were accustomed to come down from the high hills at the burst of the monsoon and take up their quarters there.

Having established himself in the neighbourhood with about 1500 men, he set them to work to build a strong fence to inclose the whole promontory, with the exception of the side next to the mainland which was to be left open for the gaurs to enter; before the fence was half finished, however, the animals unexpectedly arrived, and it was only by dint of excessively hard work that the fence was completed and they were secured. The next day a small pen about twenty yards square was constructed within the inclosure, about fifty yards from the river, and into this the whole herd consisting of twenty-four head was with considerable difficulty, finally driven.

The scene which ensued appears to have been a most extraordinary one, and we quote the account of it verbatim:—"It was a magnificent sight to see these great beasts congregated together, and it is doubtful whether a similar spectacle has ever been witnessed before by a European, or indeed by anyone. Terrified by the noise of the beaters and wild with fear, the great creatures appeared almost mad, and rushed about attacking each other with indescribable fury. Luckily a deep drain had been cut

alongside the barricade, and this prevented their charging it, otherwise they would have speedily liberated themselves. As it was, they continued to charge and fight like demons, amidst the yells and cheers of the excited crowd, until at nightfall ten of the noble beasts lay dead or dying. Two more succumbed during the night, and it was a pitiable sight next morning to see the twelve survivors all jaded and gory, utterly exhausted, but still vicious and 'game.'” Ultimately these twelve survivors, by being driven in single file down a narrow alley about five feet wide between strong fences erected for the purpose, were safely caged and floated on strong bamboo rafts down the river to Pekan, the capital of Pahang, and one of them--the animal now in the Zoo--was presented to Sir C. C. Smith, the Governor of the Straits Settlements, by whom it has been sent to England.

The gaur, which extends its range from Hindostan through the Indo-Chinese countries to the Malay Peninsula, is the largest and fiercest of wild cattle, and is said to be not only untamable, but so fierce that it will hold its own against the tiger. It grows to an enormous height, bulls measuring eighteen hands at the withers being apparently not uncommon; and specimens have been recorded, on the authority of well-known sportsmen, which far exceeded even this great height. For example, one killed by Mr. Ditmas stood not less than 20 hands $3\frac{1}{4}$ in., or 6 ft. $11\frac{1}{4}$ in., at the withers; and as, like the well-known gayal, it has a ridge running

along the middle of the back, it appears even taller; Mr. Ditmas's bull measured 7ft. 3 $\frac{3}{4}$ in. to the top of this dorsal ridge. The back is curiously arched, forming a fairly continuous curve from the nose to the base of the tail. The skull is massive, and is surmounted by a large semi-cylindrical crest, rising above the base of the horns. The muzzle is large and full. The horns in the adult bull are, like the skull that bears them, very strong and massive; they extend outwards from the head, and the points are turned upwards and inwards. A good head is shown at the Zoo, on the wall opposite the stall in which the gaur is confined. The colour of the animals is a very deep brownish-black, with the exception of a light tuft on the forehead between the horns, and four "white stockings." There is no dewlap in either sex.

"Jack," as the new arrival is called, is but a small beast, standing, as nearly as we can guess, between thirteen and fourteen hands. But if it be true, as alleged, that the bull does not attain his full growth until his tenth year, he has plenty of time to reach even the enormous proportions that we have mentioned. At the present time he is in very bad condition, being indeed little more than a bag of bones, the result of his long journey, during which, for some reason which we cannot understand, he appears to have been fed principally on bananas and other fruit; but we believe he already shows a marked improvement, and he certainly takes kindly to the good clover hay with

which he is supplied, and appears to have settled down comfortably in his new quarters in the Antelope House, in the stall next to those occupied by the Indian cattle belonging to the Prince of Wales. He shows no signs of wildness, in the sense of being frightened by his surroundings, but at the same time appears to be anything but an amiable character, as he will not allow his keeper to enter his stall, and has rather a startling trick of suddenly striking at the bars in a very suggestive manner, when anyone is looking at him. If, as we hope may be the case, he should live to maturity, it will be most interesting to watch his development, and especially to see whether constant care and attention will not have the effect of rendering him, if not tame, at least amenable to discipline. Should he, however, retain his present ferocity as he increases in size and weight, he will be anything but a pleasant animal to manage.

THE AYE-AYE.

(Nov. 16, 1889.)

THERE are many animals in the Zoo whose habits are so completely nocturnal that, for all that the ordinary visitor can see of them, they might as well have remained in their native haunts. Certainly not the least interesting of these is the Aye-Aye (*Cheiromys Madagascariensis*); in fact, there are few, if any, more interesting animals in the collection, and, unfortunately, there are none that are less often seen, as the animal in question remains in a semi-torpid condition during the day in the box at the top of its cage in the Monkey House, never by any chance moving out, or indeed showing itself. In consequence, visitors see nothing but an apparently empty cage; those, however, who are observant will notice that this cage, unlike the neighbouring wall-cages in which the lemurs are confined, is backed with patched zinc, and contains a bough which has been much gnawed as if by a rodent, the marks of its occupant's nightly amusements.

The Aye-Aye, as its scientific name implies, is a native of Madagascar, and was long a puzzle to naturalists, owing to its many peculiarities of form

and structure. Its dentition is most curious, and much resembles that of the rodents. It has only eighteen teeth, of which the four front ones, two in the upper and two in the lower jaw, are much like those of a rat—Cuvier compared the lower teeth to ploughshares—these powerful incisors or cutting-teeth are used for cutting away wood, making holes in branches, and also for gnawing through the stems of sugar-canes and similar plants; the ears are very large, round, and open, and have, not inaptly, been compared to those of a bat; the eyes are wide and staring; and—a fact which adds to the weirdness of the animal's appearance—it possesses a perfect, that is an uncleft, upper lip. Its feet, however, especially the forefeet or hands, are amongst its most striking peculiarities, the latter, indeed, being unlike those of any other animal; all the fingers and toes, with the exception of the hallux or great toe, which, like that of all the quadrumana, is opposable, and has a flat nail, are furnished with long, compressed claws; but—and herein lies the great peculiarity—the third and fourth fingers of the hands are very long, the fourth being the largest and longest, while the third is so extraordinarily thin and wasted in appearance that, to quote Professor Owen, it seems as if it were paralysed. The animal is about three feet in length, including the tail, which is long and bushy—longer, indeed, than the body; and the whole creature, with the exception of its ears, nose, and the soles of its feet and

the palms of its hands, is covered with thick dark fur.

It was discovered by the French naturalist and traveller Sonnerat about one hundred years since, who gave it the name Aye-Aye from an exclamation of the natives on seeing it. He obtained a pair, male and female, which he kept for two months, feeding them only on boiled rice. He evidently observed them very closely, and left a good description of their appearance and habits in confinement. In his opinion, the Aye-Aye did not approach any genus, but leaned towards the maki, the squirrel, and the ape. He made the curious mistake, however, of imagining it to be a subterranean animal. Buffon, who tells us that he examined the skin of one which Sonnerat presented to the Cabinet du Roi, considered that it was allied to the squirrel, and also that it bore some relation to the tarsier, and accordingly placed it among the rodents. Cuvier first placed it next to the flying squirrel, and immediately before the rat, but afterwards in the list of doubtful animals. Schreber was the first to class it among the lemurs, and named it *Lemur psilodactylus*—a name adopted by Shaw—while Sonnini, who formed the genus *Cheiromys*, observed, rightly, that it was the only species known. Most naturalists, however, continued to class it among the rodents, until, in the year 1859, Professor Owen placed it in its present position as the sole representative of the last of the three families into which the *Lemuroidea*

—the second sub-order of the Primates—are divided.

Professor Owen's Aye-Aye was obtained for him by Dr. Sandwith, who, while the animal was in his possession, observed its habits very closely, and wrote an extremely interesting account of them, from which the following is an extract:—"I thought that those strong rodent teeth, as large as those of a young beaver, must have been intended for some other purpose than that of trying to eat his way out of a cage, the only use he seemed to make of them besides masticating soft fruits. Moreover, he had other peculiarities, *e.g.* singularly large naked ears directed forwards as if for offensive rather than defensive purposes; then, again, the second finger of the hands is unlike anything but a monster supernumerary member, it being slender and long, half the thickness of the other fingers, and resembling a piece of bent wire. Excepting the head and this finger, he closely resembles a lemur. Now as he attacked every night the woodwork of his cage, which I was gradually lining with tin, I bethought myself of tying some sticks over the woodwork, so that he might gnaw these instead . . . they were bored in all directions by a large and destructive grub . . . presently he came to one of the worm-eaten branches, which he began to examine most attentively, and bending forward his ears and applying his nose more closely to the bark, he rapidly tapped the surface with the curious second digit as a wood-

pecker taps a tree, though with much less noise, from time to time inserting the end of the slender finger into the worm-holes as a surgeon would a probe. At length he came to a part of the branch which evidently gave out an interesting sound, for he began to tear it with his strong teeth. He rapidly stripped off the bark, cut into the wood, and exposed the nest of a grub, which he daintily picked out of its bed with the slender tapping finger, and conveyed the luscious morsel to his mouth." This unfortunate little beast was in due time sacrificed to science, being killed by chloroform and sent over to this country in spirit. Its skin may now be seen in the British Museum.

The older writers considered the Aye-Aye to be lazy and slothful, but this is by no means its character, as though, like the well-known dormouse, it spends its days in its nest, curled up comfortably in a ball, and covered with its bushy tail—during which time no doubt, as Sonnerat remarked, it requires a good deal of shaking to make it move—still after dusk it awakes, and is sufficiently lively and active during the night. Its method of taking its food is, as indeed is not surprising in such an extraordinary animal, most curious. In this performance the long fingers are brought into use, being dipped into the food and drawn rapidly between the lips, thus conveying it into the mouth—an action which has been compared to that of a Chinaman using his chopsticks. It also occasionally laps like a cat. The specimen at the Zoo

is fed principally on sopped bread, bananas, and dates ; fare on which it appears to thrive. It is by no means an easy animal to keep in confinement, as, like most of the lemurs, it is very susceptible to cold ; and it therefore says much for the care and attention that have been bestowed on it by its keeper that it has lived in the Regent's Park for more than two years, and is still in the enjoyment of excellent health.

LEMURS.

(Nov. 30, 1889.)

NEARLY one half of the wall-cages in the Monkey House are occupied by lemurs, which attract much less attention from ordinary visitors than do their neighbours and distant relations, the monkeys, the result, no doubt, of their less human appearance and quieter habits. Nevertheless, they are extremely interesting animals, whether from the point of view of the naturalist, or simply of the unscientific lover of pets.

Scientifically the Lemuroids are placed next in order to the monkeys and form the second sub-order of the Primates, and to quote from the very excellent guide to the Mammalia in the British Museum :—"This sub-order consists of a number of very remarkable animals of a far lower type than the monkeys; they are for the most part natives of Madagascar, although a few aberrant members of the group are found in Africa and Southern Asia. They are invariably arboreal in their habits, with generally long, bushy, and non-prehensile tails, opposable thumbs and great toes large eyes, and long dog-like faces." They are divided into three families — the Lemuridæ,

Tarsiidæ, and Cheiromyidæ, each of the two latter containing only a single species, while the first is subdivided into four groups, which contain all the remaining species known. The first and last of these families are at the present time represented at the Zoo; the first by specimens of ten or eleven species, and the last by its solitary species, the Aye-Aye.

The best known of the Lemuridæ are the true Lemurs, all of them inhabitants of Madagascar, of which something like twenty specimens, representing six or seven species, are now in the Gardens. It was to them that Linnæus gave the name Lemurs—lemures, ghosts, from their habits being more or less nocturnal—though it is now popularly extended to all the family. By most of the authors of the last century, to whom several species were known, they were called Macacos, or Makis, though we find many variations in the spelling—for example, Maucauco, Mocawk, and Mococo, and these by no means exhaust the list.

Dr. Brookes, in his *Natural History of Quadrupedes*, describes seven species, while Pennant enumerates eleven; but the ringtailed lemur was the Macaco, or Maki, *par excellence*, of all the authors of this time, being then, as now, generally the best known of the family. Unfortunately this extremely handsome and gentle lemur is excessively delicate and difficult to keep in confinement, seldom living for any length of time, and is not at present represented at the Zoo. It is the animal

which is more particularly known to sailors and dealers as the "Madagascar cat."

Among the species that are represented the ruffed lemur is certainly the handsomest, as it is also the largest; indeed, it is a very handsome and striking animal, with a long, thick, black-and-white coat, and a grand bushy black tail; but it is neither so lively nor so amiable as some of its smaller relations. The black lemur is perhaps the plainest of the family—no lemur can be called ugly; this species is noticeable for having the sexes so dissimilar in appearance that until quite recently they were considered to be specifically distinct, as the male is perfectly jet black from the end of his nose to the tip of his tail, while his mate is of a dingy yellowish-red, with white whiskers.

Animals of this species appear to be comparatively hardy in confinement, and several of them have lived for a considerable period in the Monkey House. So well, indeed, do they thrive that one female has brought forth no less than seven young ones since its arrival at the Gardens in the year 1882, the last of these, a male, having been born on June 10 last. And here we may mention the curious manner in which the young are carried. When first born, the helpless little creature, which is almost naked, clings to its mother's waist, attaching itself firmly by grasping her fur with all its hands, and twisting its tail tightly round her in such a position that when she sits up it is hidden by her legs, and so firmly is it fixed that it rides

safely through all her leaps and bounds. As time goes on and it becomes stronger it changes its position from time to time, often riding on its mother's back, and eventually, but gradually and by slow degrees, it learns to walk alone. Besides the ruffed and black lemurs, there are now living in the Gardens specimens of the five following species—the black-headed, the white-fronted, the red-fronted, the flocked, and the mongoose lemurs—all of which are dull-coloured in comparison with those we have already mentioned.

In addition to the true lemurs there are in the collection specimens of the genera *Hapalemur*, *Cheirogaleus*, and *Microcebus*, but of these one alone, the little grey lemur (*Hapalemur griseus*), is shown in a wall-cage, the others being kept in the keeper's room. This little animal, however, is one of the most interesting of the lemurs, not only for its rarity—it is but the second that has been in the possession of the Society, its predecessor having been acquired in 1883—but also for its quaint beauty and wonderfully gentle winning ways, which obtain for it a good deal of attention.

Both *Cheirogaleus* and *Microcebus* are strictly nocturnal, and, therefore, of very little interest to the general public; but this remark, perhaps, hardly applies to the brown mouse lemur (*Cheirogaleus milii*), which the keeper regards with great pride and is fond of showing to visitors. This beautiful little animal, which is in appearance much like an enormous dormouse with very large

and prominent eyes, has lived in its present quarters since the year 1878, and is still fat and well-liking. "Billy," as it is called, is perfectly tame; but from its strictly nocturnal habits is by no means lively in the daytime, though it never seems to resent being taken out of its snug nest of hay for purposes of exhibition; but, in the evening, after the Gardens are closed, it wakes up, and takes both food and exercise. Like the dormouse, this species hibernates during the cold season.

To lovers of pets, lemurs must always be of interest, as no other animals combine so many attractive qualities; in fact, in our opinion, the only drawback they possess is their excessive delicacy, which renders them extremely difficult to keep in a house; so difficult, indeed, are most of the species, and notably the most beautiful of all, the ring-tailed lemur, that even at the Zoo, where they live in an even temperature and carefully guarded from their greatest enemy, draught, they are by no means long lived. Were it not for this most unfortunate drawback they would, no doubt, be far more often kept than they are. They have all the amusing ways of the smaller monkeys without their treachery and cunning, and, though they can bite shrewdly on occasion, they are, especially if they have been captured young, usually gentle in their manners and capable of great affection; in fact, to quote an old author, they are "very sociable, gentle, harmless creatures." Their activity is most extraordinary,

and they delight in taking long flying leaps, pitching with the utmost lightness, and never by any chance missing their hold ; in this way they will, for example, leap on to the top of an open door, and from that on to a distant chair.

When in good health they are extremely playful, at which times, as Dr. Brookes said, they “use a sort of galloping with their tails raised over their backs,” pouncing about with extended arms in a peculiarly ludicrous manner. They form affections for, and are fond of playing with, not only human beings, but also other animals ; for example, one which the writer had in his possession for some time was on the most affectionate terms with a wire-haired fox terrier and a cat, both of which animals reciprocated its affection, and were never more happy than when playing with it or lying together curled up with it in a basket before the fire, where it would, with the greatest care, wash the dog’s coat, at the same time combing out any knots in the hair with its teeth ; a performance which seemed to afford the greatest possible gratification to both animals. This habit of licking and cleaning is one of the lemurs’ peculiarities, as not only do they keep themselves scrupulously clean and attend to the coats of other animals with which they may be friendly, but they also show the greatest interest in the cleanliness of their human companions ; as, for example, if a finger stained with ink be presented to them, they will lick it and scrape it with their teeth in a

most persistent manner till the stain is removed. They are most chilly animals, and nothing delights them more than a good fire, before which they will sit by the hour together with their hands spread out to the blaze enjoying the warmth, in which position, notwithstanding their fox-like faces, they are quaintly human in appearance. On a hot summer day they will sit in the sun, spreading out their arms and hands to receive the heat in the same way. They are also very fond of being nursed.

These animals make several different sounds, which to those who understand their ways are very expressive. When pleased and comfortable they purr loudly, much like a cat. They make a chattering noise when displeased or when wanting anything, and they also have a loud call-note—a rather shrill long-drawn-out coo-o-o—and, lastly, they grunt in a peculiar manner, which cannot easily be described, but which is by no means the least expressive of the sounds they make. They should be fed principally on fruit, vegetables and sopped bread; but they have most omnivorous tastes, and, if allowed to be at liberty in the room during meal times, will endeavour to help themselves to anything that may be on the table, and express the greatest disgust if they are prevented.

The one we have mentioned was particularly fond of fish and butter; the latter especially it found perfectly irresistible. It was also very fond of

tea, though it was by no means a total abstainer on principle, as it never missed a chance, if it saw one, of helping itself to either beer, wine, or spirits, though it was perfectly conscious that this was against rules and would meet with prompt punishment. This little beast, which was certainly among the most charming of its race, eventually, like most of its fellows in this country, fell a victim to the cold. All lemurs are particularly fond of anything sweet, and there is no quicker way to their affections than giving them pieces of sugar, or raisins, or—perhaps their greatest treat—lumps of “Turkish delight”; but they do not, contrary to the ideas of many visitors to the Zoo, care for nuts.

THE EUROPEAN BISON.

(Dec. 21, 1889.)

It is not often that visitors to the Zoo have the chance of seeing examples of so many species of wild and domesticated cattle as are found in the Gardens at the present time, and certainly never before have specimens of the two largest and fiercest of the wild cattle been in the collection simultaneously. Such, however, is now the case, as, in addition to the Gaur presented to the Society a short time ago, which, we may add, appears to be thriving immensely, they have lately been fortunate enough to receive "on deposit" a bull European Bison, or Aurochs (*Bison bonasus*)—an addition to the menagerie of no little interest; for, though this bison is not "new to the collection," it is many years since a specimen has been seen in Regent's Park; in fact, we believe we are correct in saying that the last, a cow, was obtained about twenty years since, and lived but a few weeks.

The bisons, both European and American, are, unfortunately, fast verging towards extinction, and though but a few years ago such a thing would have appeared impossible, there is now little doubt

that the former will survive the longest, as, though its range is confined to the Caucasus and to the forest of Bialowicza, in Lithuania, it is most strictly protected by the Emperor of Russia, while its unfortunate American cousin has been practically exterminated, having fallen a victim to the greed of the pelt-hunters.

The Aurochs, now, as we have said, extremely restricted in its range, was originally an inhabitant of all the large forests of central Europe, and is in all probability, though the fact has been disputed by many, and notably by Cuvier, the Urus mentioned by Cæsar, who described these animals as being little inferior in size to the elephant, but bulls in nature, colour, and figure, and further mentioned their great strength, speed, and fierceness. While in reality not quite so large as an elephant, or indeed as a rhinoceros, to which animal Cuvier compared it, the modern bison may fairly be described as enormous, far exceeding in size the American species, which otherwise it much resembles. Yet it, in turn, is said to be much smaller than its ancestors of quite recent times; indeed, the race is declared to be diminishing in height and weight as it decreases in numbers, though, apparently, it still retains its strength and fierceness, as it is alleged that an old bull is a match for four wolves.

At the present time a large bull will stand about 6 feet to the top of the hump on the shoulders, and is about 11 feet long; whereas

a height of 7 feet and a length of 13 feet have been recorded. The two species of bison are wonderfully alike in general appearance; they both have huge, ungainly heads, humps between the shoulders, and long shaggy manes on their heads and necks, with long beards under their chins; the hind parts are smaller than the fore, and have a comparatively weak appearance, though this is more noticeable in the American than in the European form. Again, in both cases the females are smaller and less shaggy than the male. The Aurochs, however, is by far the larger and finer animal, and, as indeed might be expected, has better horns. The two species, again, differ completely in their temperament; for, while the European bison is famous for its ferocity, the American is sluggish and timid—though this description hardly applies to the American bison bull at the Zoo, which is as bad-tempered and fierce a beast as can be found in the collection—and, in addition, has the credit of being one of the most stupid animals on earth. In fact, there is little doubt that this stupidity has been one of the causes of its destruction; for, as Captain Dodge said of it, “if not alarmed at sight or smell of a foe, he will stand stupidly gazing at his companions in their death throes, until the whole herd is shot down,” and, “having made up his mind to go a certain way, it is almost impossible to swerve him from his purpose.” And—the last difference between the species that we propose to mention—

the Aurochs has but fourteen pairs of ribs, while the American bison has fifteen pairs.

The general colour of the European bison is a light brown; but the hair of the mane, beard, and legs, together with a stripe on the middle of the back, is much darker, almost inclining to black, while the long tuft of hair on the end of the tail is black. The hair, especially on the back and hind parts, is soft and woolly. The tongue is very blue in colour. The animal has a strong musky smell, which is very noticeable, but far from unpleasant; this is said to be strongest in the winter, and to be lost by degrees when the animal is in confinement; and, finally, the hide is said to be double the thickness of that of a domestic bull. The Aurochs at the Zoo is a fine adult bull, and is certainly a magnificent animal, standing, as near as we can judge, about 17 hands at the shoulder. It is to be seen in the easternmost of the "Cattle sheds," next to the shed in which the American bisons are kept (in which latter, by the way, a bison calf was born a few days since, a beautiful little animal, well worth a visit). As yet it prefers to remain in its shed, not having fully recovered from the fatigues and dangers of its journey; indeed, though it has been in its present quarters since Nov. 25, the poor beast is still most woefully stiff and strained, the result of being sent for a sea voyage of many days' duration in a large case or crate, the bottom of which was perfectly smooth, instead of being furnished with cross-pieces fastened to the floor to

give its inmate a foothold. However, though so stiff that it can neither lie down, nor, when down, get up again with any comfort, it seems to be feeding well, and we hope, therefore, that it may live and thrive, and also that it may become the property of the Society.

THE STANLEYAN CHEVROTAIN.

(Jan. 11, 1890.)

THE Chevrotains are a group of very curious and extremely beautiful little animals, much like diminutive deer, which until quite recently were classed, with the musk-deer, among the true deer, but are now placed in a family—*Tragulina*—by themselves, between the *Tylopoda*, or camel tribe, and the *Pecora*, or oxen, antelopes, deer, and giraffe. Like the musk-deer—itself a doubtful deer, by the way—with which they were formerly classed, both sexes are hornless, and, as is the case with that animal, and also with the muntjacs, the males have two long canine teeth in the upper jaw, which project from the mouth with a backward curve, and form very noticeable tusks. One remarkable difference, however, exists between the chevrotains and the musk-deer—namely, that the former do not possess the peculiar secretion, contained in a pouch about the size of an egg on the abdomen, of the male, which was formerly used as a drug, but is now a valuable article of trade as a perfume, for which the latter animal is famous; and this fact made

many of the naturalists of the earlier part of the century extremely doubtful whether the chevrotains should not, as is now the case, be placed in a family by themselves. For example, in Bennett's *Zoological Gardens*, published in the year 1830, we read:—"This remarkable difference [the absence of the 'musk'], added to the great dissimilarity in the form and structure of their hoofs, and other minor points of discrepancy, furnishes an obvious means of subdividing the genus; and may probably, at some future time, when the animals have become more completely known, be adopted as the foundation of a generic distinction."

The Tragulina are wonderfully graceful little creatures, about the size of rabbits, with the most slender limbs imaginable, their legs being little, if any, thicker than an ordinary cedar pencil. They have long, delicately-pointed noses, and very large lustrous dark eyes; indeed, except for the fact that they are hornless, they have much the appearance of deer seen through the wrong end of a telescope. In reality, however, many of their parts are very peculiar; chief among these we may notice that their feet are more like those of pigs than deer, as each foot possesses four complete digits, and that their stomachs, unlike those of most other ruminants, have only three instead of four divisions, the third division, or manyplies, being wanting. There are two genera in the group, namely,

Tragulus, containing five or six species—among them the Stanleyan Chevrotain now represented at the Zoo—ranging from Ceylon and India through the Malay Peninsula, Sumatra, and Java to Borneo; and Hyomoschus, with but one species, the Water Chevrotain, of Western Africa. Among the Malays these animals are considered the very embodiment of cunning, much as the fox is with us, and Sir Stamford Raffles told many of their curious tales regarding it, such as that it would feign death when caught until it saw a chance of escape, when it would be up and away in a moment; and that when pursued by dogs it would spring up and hook itself to a bough by its curved tusks, and so allow its enemies to pass under it. He further tells us that “cunning as a Kanchil” is a common Malay expression.

The little animal at the Zoo is officially described as a “Stanleyan Chevrotain, *Tragulus Stanleyanus*, Ceylon. Purchased Nov. 25, 1889.” The species was named after the Earl of Derby, grandfather of the present Earl. Like all its kind, it is a beautiful little animal. Its coat is, in colour, much like a bright sable, barred with white on the chest. Its nose and ears, which latter are small and nearly bare, are black; while its eyes are very full, dark, and lustrous. Being a female, however, it does not possess the peculiar tusks we have mentioned. This is by no means the first chevrotain that has been in the possession

of the Society, as specimens are frequently brought to this country; but, as they are extremely delicate, none of them, so far as we are aware, have lived for any length of time in Regent's Park. A new departure has, however, been made in the present case by placing the animal in a house kept at a high temperature, and in a cage shielded as far as possible from draught; and we have, therefore, every reason to hope that the little creature may live and thrive longer than any of its many predecessors.

ANT-EATERS.

(April 26, 1890.)

THE ant-eaters, including not only the true ant-eaters (*Myrmecophagidæ*), all of them inhabitants of tropical America, but also the aard-varks, or ant-bears (*Orycteropodidæ*), which are found only in Africa, belong to the order Edentata—an order which has obtained its name from the fact that its members either lack teeth altogether, or at the best have but an incomplete dentition. This order is made up of several families widely different in appearance and habits, containing as it does the Sloths, the Ant-Eaters, and the Armadillos, natives of the New World, and the Pangolins and Aard-varks, of the Old.

The ant-eaters, both of the Old and New Worlds, are now, as indeed has long been the case, represented at the Zoo, and it is perhaps curious that they attract but little attention from the large number of visitors that constantly pass through their house, not one in ten of whom cast even a glance in the direction of their cages. No doubt the superior attractions of their neighbours, the anthropoid apes, and especially of "Sally," are quite sufficient to

account for this, especially when we consider that most people, after a few minutes' stay in the heated atmosphere of "Sally's" house, are only too glad to make their escape into the fresh air. Again, ant-eaters can scarcely be described as frolicsome or even lively animals. The aard-vark, indeed, being nocturnal in its habits, spends the greater part of its day sleeping peacefully in its bed of sand, generally with its back turned to its visitors; while the great ant-eater, if not asleep under a covering of straw, stalks slowly round and round its cage with an appearance of most abject listlessness and want of interest in its surroundings. This listlessness and want of interest is, no doubt to a very considerable extent, caused by the fact that visitors cannot feed it, stale buns and nuts having no attractions whatever for an ant-eater. That it does take a lively interest in matters which appeal to its stomach will be admitted by anyone who has seen it fed, or, better still, has seen its keeper give it a dead mouse—a very favourite *bonne bouche*. And here we may remark upon the extraordinary fact that a vast proportion of the visitors to the Zoo are apparently convinced that nuts and stale buns form the natural and favourite food of all "wild beasts"—in which term they include every living creature to be found in a menagerie, from an elephant to a tortoise, and, accordingly, never fail to press those dainties upon the inmates of the cages, often in defiance of notices requesting that the animals may not be fed. A habit which leads,

for example, to the water in the crocodiles' pond being generally covered with floating nuts and pieces of sodden bread and buns.

The Great Ant-Eater (*Myrmecophaga jubata*) is far too well known to need any detailed description here. It is a most uncanny-looking creature ; its curious little head, with small eyes and ears, and extraordinarily long snout ending in a diminutive mouth ; its great fore-limbs armed with enormous claws, which it carries folded in upon its palms ; and its huge, bushy tail giving it an odd appearance of being out of all proportion. This odd appearance, indeed, no doubt gave rise to the extraordinary stories that were told of it by the earlier travellers and writers—such, for example, as that it was in the habit of climbing trees in search of its food, a story which aroused the wrath of the late Charles Waterton, who attacked both the story and its authors with his usual fierceness. The author also strongly objected to “the remark that the long visage of this most singular quadruped is out of proportion and unsightly,” stating that he “considered it to be quite in unison with the rest of the body, and admirably adapted to the support of life ;” adding, “What could the ant-bear do without its tremendous claws, and cylinder-shaped snout, so tough as to enable it to perforate huge nests of ants, which in certain districts of Southern America appear more like the roofs of Chinese temples than the work and habitations of insignificant little insects ?” The ant-eater's method of

obtaining its food is said to be as follows : Having torn open an ant-hill with its powerful claws, it draws its enormously long flexible tongue, which is covered with a glutinous saliva, over the masses of insects which rush out in defence of their home, with the result that numbers of them adhere to it, and are thus drawn into the animal's mouth ; and, so quickly is this operation repeated, that we are assured that the tongue is put out, and drawn in again covered with insects, twice in a second. Quaint Dr. Brookes describes the process as follows : "He [the ant-eater] lives upon ants, and when he has found out one of their nests, he opens the upper part of it with his claws, that he may have room to put in his snout and tongue. This is besmeared with a slimy liquor and is soon covered with ants, which, when he finds, he draws it into his mouth and swallows them. He repeats this practice as long as there are any remaining, or at least as long as they will run into the same snare. When he is hungry again, he will go in quest of another nest." The tongue is a wonderful organ, much longer than the head, round, and capable of being projected sixteen or eighteen inches ; in appearance it is very much like an enormous worm ; when at rest it is bent backwards in the mouth, or, as Dr. Brookes has it, "he is obliged to bend part of it back when he keeps it within his mouth, for it is not long enough to hold it without this artifice." When the animal at the Zoo is fed, this curious tongue is most noticeable sweeping

round the pan in which the food is contained in a most extraordinary manner. Don Felix d'Azara, who wrote what is still probably the best account of this animal and its habits, says: "It seems almost incredible that so robust and powerful an animal can procure sufficient sustenance from ants alone; but this circumstance has nothing strange in it for those who are acquainted with the tropical parts of America, and who have seen the enormous multitudes of these insects which swarm in all parts of the country to that degree that their hills often almost touch one another for miles together." The ant-eater is described as being an extremely stupid slow-moving animal, by no means given to attacking its neighbours, but when hard pressed it is said to sit up on its hind quarters like a bear and defend itself with its powerful claws. *Apropos* of this habit we have heard the following story of an ant-eater at the Zoo, and, though we cannot vouch for its scientific accuracy, it has a moral, and will, we think, bear repetition. A man—one of the class so well known to, and hated by, the keepers, whose chief interest in visiting the menagerie appears to be to torment the unfortunate animals—standing by the ant-eater's cage was heard to remark that this was the sort of animal he liked, as it could not bite. He then proceeded to poke it with his new silk umbrella, on which the ant-eater retaliated by quietly taking hold of that weapon with its claws, with the result that the unfortunate owner was left in possession of the frame, while the

animal carried off the silk as a trophy of well-earned victory over its enemy. Not only is it a stupid and slow-moving animal, but it is also an extremely sleepy one, and when preparing for sleep it makes a very good though curious use of its enormous tail, as it lies down on one side, rolls itself into as small a compass as possible, and turns the tail over its body so as to completely cover it.

The Cape ant-bear or Aard-vark (*Orycteropus capensis*) being, as we have said, nocturnal in its habits, is by no means so well known to the general public as is its neighbour, the great ant-eater; in fact, but little more can generally be seen of it than a piece of fat and pig-like back, as it spends its day reposing in a hole which it has dug for itself in the coarse sand with which it is plentifully supplied; but at feeding-time, in the morning, it is out and about, and is then sufficiently lively. It is a most extraordinary-looking creature, so curious that, in our opinion, a sight of it alone well repays an early visit to the Gardens.

The name aard-vark, or earth-pig, given to these ant-eaters by the early Dutch settlers at the Cape, is a most happy one, as the creature is comically pig-like in appearance, though it is perhaps rather the pig of a nightmare than of real life that it resembles. The body is long and low, covered with coarse, bare-looking skin and bristles, and rests on short thick limbs, with four toes on the fore and five on the hind feet, which are modified for digging, and therefore very unlike those of a

pig ; the long snout, with round nostrils pierced in the end of it, is, however, very pig-like ; but the mouth is small, and the end of the snout and nostrils are thickly covered with light hair ; the ears are very long, erect, and pointed, and give a comic expression to the face ; the tail, which is stout and powerful, is very curious, being perhaps best described as a tapering of the body to a point, as it is extremely thick and cylindrical at the base, but decreases gradually towards the end, which is pointed. The tongue, unlike that of the great ant-eater, is flat, and though it can be protruded to a considerable extent, cannot reach anything like the distance that that animal's does ; it is, however, covered in the same way with a glutinous saliva, which enables its owner to catch the ants on which it lives, a feat which the animal performs much in the same way as does the great ant-eater. The aard-vark's teeth are of a highly peculiar and complex structure, and it has many anatomical peculiarities which, however, are not within the scope of this article. It is a curious, retiring beast, digging for itself great burrows in which it spends the day, and from which, if half the tales we hear be true, it is an extremely difficult matter to dislodge it, as it digs with such rapidity that it seems literally to sink into the ground, in addition to which, it is so strong that, if it be caught, it is by no means easy to drag it from its earth. The specimen at the Zoo, though so lazy by day, seems active enough at night, as it turns its sand in all directions, gene-

rally making a new resting-place for each day, and the keeper tells us that, if by chance its food-tin is left in its cage at night, it will certainly be buried in the morning.

Ant-eaters apparently live and thrive well in confinement, those at the Zoo being quite old inhabitants, the great ant-eater, a male, having lived in its present quarters since April 24, 1883, and the aard-vark, a female, since October 30, 1884.

THE ENGLISH WILD BULL.

(July 19, 1890.)

SOME time ago, in our notice of the European Bison, we drew attention to the extremely interesting collection of cattle, both wild and domesticated, then in the Gardens in Regent's Park. No deaths have occurred since that time, but the collection has been increased by several births, among which we may mention, first, a young gayal, born early in the year; secondly, a curious hybrid, in which the blood of the gayal, the zebu, and the American bison are mixed, the mother being the well-known large hybrid cow, and the father, the American bison bull; and, lastly, a yak, born only a week or two since, one of the prettiest little creatures imaginable, with a woolly coat and pink nose. These births, however, are really hardly worth mention, as calves of one sort or another are constantly to be seen in the cattle-sheds; but a very noticeable addition was made on June 25 last by the arrival of a young English wild bull (*Bos taurus* var.) presented to the Society by Lord Ferrers from his famous herd at Chartley, in Staffordshire, an animal "new to the collection."

The British Wild White Cattle have been the cause of endless long and learned arguments, the point in dispute being whether they are an aboriginal race, direct descendants of *Bos primigenius*, or merely the outcome of domestic cattle which have become feral. As is not unusual, both parties give excellent reasons for the faith that is in them; but the exigencies of space alone are sufficient to prevent us giving even a faint outline of the arguments adduced on one side or the other. Suffice it to say that, in our opinion, the weight of evidence is in favour of what we may call the aboriginal theory, though possibly the writer who remarked that, "whether they were derived from abroad, or were descended from wild individuals of the urus race, native to Britain in former ages, are questions which the lapse of time will never solve, but rather tend to shroud in deeper darkness," took the wisest view of the situation. One fact, at all events, is undisputed—namely, that, whether aboriginal or not, they are an extremely ancient race. Numberless quotations from early writers could be given in support of this. Perhaps the best known, though by no means the earliest, of these is that of Hector Boëce, or Boëthius, who, writing in 1526, alleged that there were then to be found in Scotland, in the Caledonian Forest, which at that time extended from Stirling through Monteith and Strathearn to Athol and Lochaber, wild cattle of a pure white colour with manes like lions, or, as

Holinshed has it, with "crisp and curled manes like feirs leonis." Another writer of about the same date stated that "thocht thir bullis were bred in sindry boundis of the Colidin Wod, now be continewal hunting and lust of insolent men, they are destroyit in all parts of Scotland, and nane of them left but allenerlie in Cumernald." Long before this, however, FitzStephen had left it on record that in his time wild bulls were to be found, with other large game, in the great forests which then surrounded that city. And in the fourteenth century King Robert Bruce was nearly killed by a wild bull "in the great Caledon Wood," as Holinshed tells us, but was rescued by one of his followers, "whom he endowed with great possessions, and his lineage is to this day called of the Turnbolls, because he overturned the beast, and saved the King's life by such great prowess and manhood." Again, in 1466, at the feast which was held to celebrate the "intronization" of George Nevell Archbishop of York, we find six wild bulls mentioned as forming part of the extremely heterogeneous bill of fare provided for the occasion.

These few extracts are sufficient to show that wild cattle have lived in Great Britain, at all events for many centuries, and though the race is undoubtedly dwindling, they are still to be found in both England and Scotland inhabiting a few large parks.

Before giving any further account of these wild

cattle and their habits, we cannot resist the temptation of quoting Pennant's remarks on the reason why England was always famous for its cattle. He says : "The climate of Great Britain is above all others productive of the greatest variety and abundance of wholesome vegetables, which, to crown our happiness, are almost equally diffused through all its parts ; this general fertility is owing to those clouded skies which foreigners mistakenly urge as a reproach on our country ; but let us cheerfully endure a temporary gloom, which clothes not only our meadows, but our hills, with the richest verdure. To this we owe the number of our cattle." However, to return, wild cattle are, as we have said, a dwindling race ; for, as Mr. Harting tells us in his extremely interesting account of the British Wild White Cattle, published in 1880, only six herds are left out of twenty-one, "concerning which some historical notices are to be found," and individually these cattle are certainly becoming smaller, and generally deteriorating. So long ago, indeed, as 1836, "Robert Brown, Esq., Chamberlain to his Grace the Duke of Hamilton," wrote of the cattle at Cadzow, "The circumstances of their breeding *in-and-in*, of being chased so much when any of them are to be shot, of being so frequently approached and disturbed by strangers, and of having been exposed so long to all the vicissitudes of the seasons, and constantly browsing the same pasture, have no doubt contributed greatly to the

deterioration of the herd, and must have reduced them much in size and other qualities," and other writers speak of them as having "worn out" in places where they were formerly to be found. However, where they still live they are most carefully preserved.

That at Chillingham, the property of Lord Tankerville, is certainly the best known of all the existing herds. That at Chartley probably taking the second place. The cattle comprising these herds differ in many points—for example, in the colour of their ears, which are red in those at Chillingham and black in those at Chartley, though it would appear that this difference did not always exist, and is, as Darwin suggested, the result of selection, as both Pennant and Bewick speak of the Chillingham cattle as having black muzzles and *ears*. They also differ in the shape of their horns, which in the former are very fine and bent upwards, while in the latter they are long and, by comparison, straight—the Chartley cattle being, as Mr. Harting says, "in fact, 'long horns.'"
There are other points of difference; but these are, perhaps, the most noticeable. Pennant's remark, that though they have lost their manes they retain their fierceness, applies to the members of both herds, though perhaps not in an equal degree, as Mr. Harting tells us those at Chartley are not so wild as the Northumberland herd, and adds that it has been suggested that this is probably owing to the circumstance that

the park is bounded on one side by a public road, from which it is only separated by a paled fence, which is not the case at Chillingham, so that they are at Chartley much more habituated to the sight of man. All the wild white cattle possess a peculiarity which distinguishes them from domestic cattle; namely, that they hide their calves, "concealing them" — we again quote Robert Brown — "among long grass or reeds in some brushwood or thicket, and approaching them cautiously twice or thrice a day for the purpose of supplying them with the necessary nourishment. On these occasions it is not a little dangerous to approach the place of retreat, the parent cow being seldom at any great distance, and always attacking any person or animal approaching it with the utmost resolution and fury." The young calves, when startled, lie with their heads close to the ground and with their ears back close upon their necks, "like a hare in her form;" but are said to butt fiercely if touched, calling the while to attract the attention of the herd.

The writer of Bewick's well-known account of these cattle, who was apparently intimately acquainted with the Chillingham herd, tells us that on one occasion he "found a hidden calf, two days old, very lean and very weak; on stroking its head, it got up, pawed two or three times like an old bull, bellowed very loud, stepped back a few steps, and bolted at his legs with all its force. It then began to paw again, bellowed, stepped

back, and bolted as before; but, knowing its intention, and stepping aside, it missed him, fell, and was so very weak that it could not rise, though it made several efforts. But it had done enough; the herd were alarmed, and, coming to its rescue, obliged him to retire."

Another point of distinction between the wild and domestic cattle is that the former feed in herds, while the latter scatter widely while feeding. No doubt this habit of the wild cattle is necessary for their protection. If disturbed, they attack in a body, and, forming into line, they advance upon the intruder "until they come within ten yards, when most people think it prudent to leave them, not choosing to provoke them further." All accounts agree that there are few more dangerous animals than one of these bulls when wounded, and numberless stories are told of their ferocity. The method of killing them adopted in old days seems to have been both clumsy and barbarous: and though, no doubt, sufficiently exciting, was decidedly unsportsmanlike, and the so-called marksmen must certainly have been wanting in skill, though Bewick tells us that "it was perhaps the only modern remains of the grandeur of ancient hunting." His account of the performance is as follows:—"On notice being given that a wild bull would be killed on a certain day, the inhabitants of the neighbourhood came mounted and armed with guns, &c., and sometimes to the amount of a hundred horse and four or five

hundred foot, who stood upon walls, or got into trees, while the horsemen rode off the bull from the rest of the herd, until he stood at bay, when a marksman dismounted and shot. At some of these huntings, twenty or thirty shots have been fired before he was subdued. On such occasions the bleeding victim grew desperately furious, from the smarting of his wounds, and the shouts of savage joy that were echoing from every side." Another author says that "some of these [bulls] have been known to receive as many as eleven bullets without one of them piercing their skulls. When fretted in this manner, they often become furious." After this it is refreshing to find that Bewick adds that "from the number of accidents that happened, this dangerous mode has been little practised of late years; the park-keeper alone generally shooting them with a rifled gun at one shot."

The bull at the Zoo is a nice little beast; he is quite young, only a yearling we believe; but we feel considerable doubt whether he will make a large animal. He is white, with a black muzzle, black ears and black hoofs, and—a fact which we have never seen mentioned in connection with the Chartley cattle, though it is one of the marks of the Hamilton herd—his legs below the knees, especially his forelegs, and his nose about the muzzle are mottled with black. Though the rest of his hair is pure white, his skin is sparsely sprinkled with round black spots, except in the

region of his spine, where they are very numerous, which are very noticeable through his somewhat thin coat. His horns are quite straight and stand out horizontally, and are therefore useless for butting, but his keeper says he has a nasty knack of striking with them sideways if annoyed. He seems to have settled down very comfortably in his new quarters, and certainly does not give one the idea of being untameable or indeed even very fierce, though we believe he has a shrewd temper of his own. Certainly Lord Ferrers's keeper, who brought him to town, need have been under no apprehension, as we believe was the case, that he would prove more than the authorities at Regent's Park could manage, though, we may add that, after the keeper had been shown round the gardens, he materially altered his opinion, and arrived at the conclusion that there were larger, stronger, and probably fiercer animals in the collection than even a young bull of the famous Chartley breed of wild white cattle.

RHINOCEROSSES.

(Oct. 18, 1890.)

RHINOCEROSSES are now so common in menageries and so many have been seen at the Zoo that it is difficult to realise that until the early years of this century only about half a dozen of these animals had been seen in Europe since the time of the Roman Empire. Yet so it was, and consequently the accounts of the earlier authors teem with the most marvellous stories, not only of the appearance, but also of the manners, of these creatures. But, if their stories were marvellous, their pictures were even more wonderful, most of them representing an impossible creature clothed in what was apparently intended for a highly ornamented suit of armour. The first of these wonderful drawings is said to have been made in Lisbon in the year 1513 from a rhinoceros sent from India to Emmanuel, King of Portugal, and was engraved at Nürnberg by Albert Dürer; and here we may add that the King, after trying all sorts of experiments to prove the ferocity of this rhinoceros, sent the unfortunate animal by sea as a present to the Pope; but "in an access of fury it sunk the vessel

on its passage." The following are examples of the stories to which we refer.

One veracious author informs us that "a full-grown rhinoceros measures fourteen feet from the ground to the highest part of the back, and the legs are so remarkably short that, with all this height, the belly comes near the ground." It is, perhaps, hardly surprising that an animal of this immense size should be able to "toss up a large bull," as we are told the "old ones" were in the habit of doing whenever opportunity offered.

From another source we gather that the rhinoceros—the African black rhinoceros, apparently, in this case—was most distinctly an animal to be avoided, as "when he attacks a man he lays hold of the middle of his body, and throws him over his head with such force that he is almost always killed with the fall. This done, he come and licks him, and his tongue is so rough and hard that it brings off the flesh from the bones. He likewise serves other animals in the same manner after he has killed them." This being so, it is reassuring to learn that "he very rarely attacks mankind, unless he is provoked or meets with a person with a red garment," and that "when he is seen running along, it is pretty easy to avoid him, because he cannot turn about very readily, so that when he is about eight or ten feet distant, a man needs only go one side, and then he will be out of his sight." The rhinoceros, however, though so fierce and untameable, had apparently one soft

spot in its heart, which often led to its destruction, for “it is said by Albertus, Isidorus, and Alumnus that above all creatures they love virgins, and that unto them they will come, be they never so wilde, and fall asleep before them, so being asleep they are easily taken and carried away.”

Finally, the horn of the rhinoceros was supposed to possess wonderful medicinal properties, and to be an antidote to poison—a belief which held its ground until quite the end of last century, for Dr. Brookes, writing in 1763, says: “It has been usually said that the horn of a rhinoceros will fall in pieces when poison is poured therein. At the Cape they have cups made of the horn, which are mounted in gold and silver. When wine is poured therein it will rise, ferment, and seem to boil; but when mixed with poison, it cleaves in two, which experiment has been seen by thousands of people.”

Rhinoceroses, of which five or six species are known, are found only in the African and Indian regions; and though they vary much in appearance, they all of them have large unwieldy bodies, supported on short legs, with three toes on each foot, skins which are thick and unyielding—so much so, in the Asiatic species, as to “necessitate the formation of deep folds to enable them to move their limbs with any facility”—and either one or two horns, which differ from those of other mammals not only in their position (placed as they are on the animal’s nose), but also in their structure, as they are “composed of modified and

agglutinated hairs." At the present time there are five individuals at the Zoo, representing three species, one African and two Asiatic, namely, one common African black rhinoceros (*R. bicornis*), two hairy-eared rhinoceroses (*R. lasiotis*), and two Indian rhinoceroses (*R. unicornis*). Three of these are old inhabitants of the Gardens, one of the Indian rhinoceroses having been presented to the Society so long ago as July 25, 1864, while the female hairy-eared rhinoceros was purchased in 1872. This animal, "Begum" by name, is said to have been captured in rather a curious way, having had the misfortune to walk into a quicksand, from which it found it impossible to extricate itself. And, lastly, the African black rhinoceros has lived in Regent's Park since 1868. This animal is specially noticeable as being, to quote the official "Guide to the Gardens," "the first specimen of this animal brought to Europe since the days of the Romans."

Though a far larger number of Asiatic than African rhinoceroses have been seen alive in Europe, the latter are, we imagine, far better known in this country—by report, at least—than are their Asiatic congeners, the result of their being found very plentifully in what was, without exception, the finest game country in the world, and thus, naturally, being fully described in every book relating to travel or sport in South Africa.

Much has been written about the number of species of rhinoceroses found in Africa, some

authors contending for as many as five species; but the best authorities are satisfied with two, the black rhinoceros—so called, though in reality it is of a dark slate colour—and the white or square-mouthed rhinoceros; both of them are two-horned and smooth-skinned; but the former, among other points of difference, has a long pointed and prehensile upper lip, and feeds on leaves and branches, while the latter has a short upper lip and feeds on grass. The black rhinoceros is found all over the continent—the animal in the Zoo was captured in Upper Nubia—and is therefore in little present dread of extermination; but the range of the white rhinoceros is—or, perhaps it would be more correct to say, was—limited to Southern and South Central Africa, with the unfortunate consequence that it has been practically, if not absolutely, exterminated. On this subject Mr. Selous made some interesting remarks in an article which appeared in the *Field* on August 16 last. He says:—

It was within a mile of this spot (near the river Se-who-who, in Mashunaland) that two years previously (*i.e.*, in 1883) I shot two white rhinoceroses (*R. simus*), the last of their kind that have been killed, and perhaps that ever will be killed, by an Englishman. They were male and female, and I preserved the skin of the head and the skull of the former for the South African Museum in Cape Town, where they now are. I shall never cease to regret that I did not preserve the entire skeleton for our own splendid Museum of Natural History at South Kensington, but when I shot the animal I made sure I should get finer specimens later on in the season. However, one thing and another prevented my visiting the one spot of country where I knew

that a few were still to be found, and now these few have almost, if not quite, all been killed, and to the best of my belief the great white or square-mouthed rhinoceros, the largest of terrestrial mammals after the elephant, is on the very verge of extinction, and in the next year or two will become absolutely extinct; and if in the near future some student of natural history should wish to know what this extinct beast really was like, he will find nothing in all the museums of Europe and America to enlighten him upon the subject but some half-dozen skulls and a goodly number of the anterior horns. In 1886 two Boer hunters got into the little tract of country where a few white rhinoceroses were still left, and between them killed ten during the season; five more were killed during the same time by some native hunters from the Matabele country. A few were still left, as in the following year, 1887, myself and some English sportsmen saw the tracks of two or three in the same district, but could not find the animals themselves. Some of these last remnants of their race may still survive; but it is not too much to say that long before the close of this century the white rhinoceros will have vanished from the face of the earth. . . . The subject of the extinction of this huge quadruped has a melancholy interest for me, who remember that less than twenty years ago it was a common animal over an enormous extent of country in central South Africa.

The extermination of the white rhinoceros is, perhaps, not to be wondered at, as it is one of the inevitable results of the extension of the settlements in South Africa; but that no museum in Europe or America should possess a specimen—if we except the young mounted specimen, about the size of a large pig, in the British Museum—is curious, and very much to be regretted, and we are pleased to see that Dr. Sclater has called

attention to the fact in the columns of *Nature*, "in the hope that the attention of the several exploring parties now traversing Mashunaland and Matabeleland may be called to this subject, and that in case of a straggling survivor of the white rhinoceros being met with, it may be carefully preserved for the National Collection at South Kensington." He draws attention to the following differences in the forms of the heads of the two species. First, the different formation of the lips already mentioned; secondly, the size and shape of the ears; "in *R. bicornis* the ear-conch is much rounded at the extremity, and edged by a fringe of short black hairs which spring from the margin. In *R. simus* the ear-conch is much elongated and sharply pointed at its upper extremity, where the hairs which clothe its margin constitute a slight tuft. While the upper portion of the ear-conch is much more expanded in *R. simus* (than in *R. bicornis*), in the lower portion the two margins are united together for a much greater extent, and form a closed cylinder, which rises about three inches above the base." Thirdly, the shape of the nostrils, "which in *R. simus* are elongated in a direction parallel to the mouth, while in *R. bicornis* they are more nearly of a circular shape"; while, lastly, the eye in *R. simus* appears to be placed further back in the head than in *R. bicornis*. Another point of difference, mentioned by Mr. Selous, is that the square-mouthed rhinoceros walks and runs with its nose close to the ground;

while the black rhinoceros carries its head high in the air.

In conclusion, we can only say with Dr. Sclater that "the country in which alone (as it is possible, but by no means certain) the last stragglers exist being now within the British Empire, it is clearly our duty to endeavour to obtain and preserve examples of the great white or square-mouthed rhinoceros for the use and information of posterity."

THE CRYPTOPROCTA.

(Dec. 13, 1890.)

AN addition to the Zoo Gardens of far more than usual interest has been made by the acquisition of a Cryptoprocta (*Cryptoprocta ferox*) purchased by the Society on November 12 last. The animal—an inhabitant of Madagascar, the home of so many curious forms of animal life—is “new to the collection,” which fact alone renders its appearance in the Gardens a matter of interest. Our reason, however, for attaching unusual importance to its arrival is that it is not only “new to the collection,” but it is also an extremely rare animal—so rare, indeed, that it is little known to science. It is, of course, no uncommon thing for the Society to obtain animals specimens of which have never before been seen in the Gardens, or indeed even in Europe—the gaur, for example—yet which are perfectly well known both to scientific men and to sportsmen; but *Cryptoprocta* is not one of these, as very few specimens have been obtained, and only two, so far as we are aware, have previously been seen alive in Europe, one of which was living in the Zoological Gardens at Rotterdam in the year 1873, and the other in the Jardin des Plantes, at Paris, in the year 1874. The fact that the animal

has only a scientific name—or, rather, that it possesses no English name—goes far to prove its rarity. It has the further distinction of being the only known member of its family. Of the few specimens obtained, the first known to science was presented to the Zoological Society so long ago as 1833 by Mr. Telfair, a corresponding member of the Society and President of the Mauritius Natural History Society, and was described by Mr. Bennett in Vol. 1 of the “Transactions of the Zoological Society.” This animal, however, did not reach England alive. The donor stated that he received it from the interior of the southern part of Madagascar, but that he had not seen in Mauritius any of the Madagascar people who were acquainted with it. He kept it for some months, and described it as the most savage creature of its size that he ever met with. Its motions and power and activity were those of a tiger, and it had the same appetite for blood and destruction of animal life. Its muscular force was very great, and the muscles of its limbs were remarkably full and thick. Since that time M. Pollen, one of the joint authors of Schlegel and Pollen’s “Faune de Madagascar,” has added considerably to our knowledge of this little-known animal. *Cryptoprocta* appears to form a connecting link between the civets (*Viverridæ*) and the cats (*Felidæ*), having, according to Bennett, the prickly tongue, the two tubercular molar teeth in the upper jaw, and other characteristics which distinguish the civets from

the cats on one side and from dogs on the other; but, like the cats, its claws are retractile. Bennett describes them as "truly retractile," but M. Pollen says that they are not so perfectly retractile as those of the cat. In its internal anatomy, Bennett tells us, it nearly approaches the cats. In many respects, again, it resembles the *Paradoxures*, for example, in the nakedness of the soles of its feet—a very noticeable characteristic—but it differs from them in that its hair is close, short, and smooth, instead of being soft, loose, and spreading, as is the case with members of that family, and in the fact from which Bennett gave it its generic name. M. Pollen, who enumerates many points in which it both resembles and differs from the *Felidæ*, compares its colour to that of the puma (*Felis concolor*), a very happy comparison, the animal being a light brownish red. This author, who appears to have had some experience of these animals in their native haunts, tells us that they are called "fossa" by the natives of Madagascar, and describes them as being by no means dangerous to man except when wounded or during the breeding season, though the natives appear to have a very wholesome dread of them, and have many curious stories and fables about them. They are said to be terribly destructive—*massacreurs de première classe*, is M. Pollen's expression—and he relates that one of them in a very short time carried off two turkeys, three geese, and a score of fowls, the owner of which assured him that

fossas would, if occasion offered, take, not only fowls, but also young pigs and other domestic animals. They are also said to climb trees in pursuit of lemurs, of the flesh of which animals they are very fond. When the natives capture an unfortunate fossa they torture it to death, having previously burnt off its moustaches for the purpose of disgracing it, as they say. M. Pollen gives an account of an expedition which he made during his stay in Madagascar for the purpose of shooting a *Cryptoprocta* which had been doing great mischief to the villagers' fowls. The hunt, if so it can be called, took place by moonlight. Accompanied by several natives, one of whom carried a cock, he took up his position in a small thicket at some distance from the village. The cock was then made fast to a peg, driven into the ground, a short distance from their hiding place, by a cord, one end of which was held by one of the hunters, who, by constantly jerking it, kept the bird in a state of noisy excitement, with the result that, after waiting about half an hour, a noise like the howling of dogs was heard at some distance. This was repeated from time to time, at last two fossas appeared under the shade of some large trees, and "like shadows gliding through the grass;" though the cock was not allowed to be quiet, the cunning animals, no doubt suspecting mischief, kept out of range. M. Pollen, however, eventually obtained a shot, but was only successful in breaking the leg of one

of them, which unfortunately escaped, the other going off, as he says, safe and sound. It appears that the flesh of the *Cryptoprocta* is, in the opinion of the natives, good to eat, for we are told that they enjoy "beefsteaks" of this animal, which they say are excellent.

The specimen now in the Zoo is a young male, about half grown. It is to be seen in the "small Cats' House," and is apparently in excellent health, and has taken kindly to its new quarters. It is a curious-looking little beast, about the size of a large cat, with a long body, and short, stout legs, and, perhaps, at the first glance the most noticeable part of it, a tail which is very long, cylindrical, and tapering. Its colour, with the exception of the tips of its toes, which are white, is a bright reddish-brown, the under parts being by far the reddest. Its head is much like that of a genet. Marvellously quick as it is in all its movements, its general appearance makes it easy to believe it the arch-destroyer which M. Pollen describes. It certainly does not show the untameable ferocity described by Telfair; indeed, it seems rather a kindly little animal, especially when compared with many of its neighbours in the Cats' House, among which may be reckoned some of the fiercest creatures in the Gardens; but we believe it is not to be trusted. In conclusion, while hoping that it may live long and thrive in its present quarters, we have the satisfaction of knowing that, when it dies, science is likely to profit by its decease.

CONIES.

(Nov. 21, 1891.)

IN the words of Agur, the son of Jakeh, "there be four things which are little upon the earth, but they are exceeding wise," the four things in question being ants, conies, locusts, and spiders; and in proof of the wisdom of the conies, we are told, that though they are "but a feeble folk, yet make they their houses in the rocks." Not only are the conies wise—and their wisdom in all that relates to their own safety would appear to be one of the few points in their economy about which there has never been any dispute—but they are also among the oddest and most anomalous of four-footed beasts, though the latter fact was probably unknown to the ancients, as it certainly was not discovered until their anatomy was studied. The animal in question is, in reality, no coney, or rabbit, though it bears a quaint superficial likeness to one, with very short ears and no perceptible tail. Indeed, the little likeness that it does possess to a rabbit can hardly be said to be skin-deep. It is, in fact, a Hyrax, a little animal which has always been, and still is, a puzzle to

zoologists, a sort of waif or stray of nature, having no near relations in the world at the present time, and no direct affinity with any extinct form as yet discovered.

The Hyracidæ, of which there are some six or seven species, are active furry little beasts, much like rodents in appearance and habits, and have been compared to hares, rabbits, and marmots—a likeness which accounted for the position which was formerly allotted to them by naturalists among the rodentia, but which was not sufficient to retain them in that order when their anatomical structure came to be studied by the scientific zoologists of the present century. Cuvier was the first to point out that they were wrongly placed among the rodents, and he removed them, and placed them among the ungulates, or rather pachyderms, between the rhinoceros and tapir—a position which they retained for some time, but from which they have now been dislodged, and placed in an order—Hyracoidea—by themselves. Certainly no one guided by outward appearance alone could imagine any affinity whatever between active little furry animals like these and such ponderous beasts as the elephant or rhinoceros, and Cuvier very justly observes in this connexion that there is no quadruped which proves more completely than Hyrax the necessity of having recourse to anatomy for the determination of the true relations of animals. It is, of course, impossible within the limit of this article to give even an outline of the

anatomy of the Hyracidæ; but one or two noticeable features common to the family may be mentioned—for example, the number of ribs is extraordinarily large, twenty-one or twenty-two on each side as against the twelve or thirteen usual among the rodents. The feet, again, are peculiar, as the front ones have four and the hind ones—which are very much like those of the rhinoceros—three toes, or rather rounded hoofs, respectively, which are absolutely unlike the claws of rodents; or, as Bruce put it in his description of the Abyssinian Hyrax, which he called the Ashkoko, “the nails are rather broad than sharp, much similar to a man’s nails ill grown,” to which description he added the remark that “these appear to be given him rather for the defence of his soft toes than for any active use in digging, to which they are by no means adapted.” The soles of the feet are covered with fleshy pads which enable the animals to cling to, and thus climb safely up, vertical and smooth surfaces, such as rocks and trees. The dentition, which consists of incisors and molars alone, is remarkable. The upper incisors are two in number and rootless, as in the rodents; but, unlike the chisel-shaped teeth of that family, are triangular, and terminate in a sharp point, and are not unlike the canines of the hippopotamus, while the lower incisors, four in number, are short, flattened, and rooted; the molars are much like those of the rhinoceros seen through a diminishing glass. And, lastly, the

intestinal canal is unique in its arrangement, being unlike that of any other vertebrate animal.

The Hyracidæ are found throughout the Ethiopian region, with the exception of Madagascar; in other words, throughout Africa south of the Tropic of Cancer and in southern Arabia, one species being found in Fernando Po, while another—*H. syriacus*, the coney of the Bible—is an inhabitant of Syria, and thus enters the Palæarctic region. There are two forms, which, according to some authorities, differ so much both in structure and habits as to be entitled to generic rank. The first, Hyrax, includes several species, of which *H. capensis* and *H. syriacus* are well-known examples, all of which inhabit mountainous and rocky regions and live on the ground. The other, Dendrohyrax, of which *D. dorsalis*, to be mentioned hereafter, is an example. Its members frequent the trunks and large branches of trees, in holes in which they sleep.

The "conies" are noticeable apart from their zoological interest from the fact that one of them, *H. syriacus*, is without doubt the Hebrew "Shaphan," improperly translated coney in our version of the Bible, where it is mentioned four times: in Leviticus and Deuteronomy as an unclean beast, in company with the camel and the hare, "because he cheweth the cud, but divideth not the hoof," in the Psalms as making "its home in the rocks," and in Proverbs in the passage already quoted. These passages have given rise

to considerable controversy, but, as we have said, there is no doubt that the Hyrax is the animal intended, and there is equally no doubt that it does not chew the cud. With regard to the first two passages in which it is said to chew the cud, Canon Tristram, who observed it in Palestine, writes as follows:—"It is quite sufficient to watch the creature working and moving its jaw, as it sits in a chink of the rocks, to understand how any one writing as an ordinary observer, and not as a comparative anatomist, would naturally thus speak of it, and this apart from the question whether the Hebrew word signifies anything more than 're-chew.'" The same authority adds that "the stony rocks are a refuge for the conies, and tolerably secure they are in such rocks. No animal ever gave us so much trouble to secure. They are far too wary to be taken in traps, and the only chance of securing one is to be concealed patiently about sunset or before sunrise on some overhanging cliff, taking care not to let the shadow be cast below, and then to wait till the little creatures cautiously peep forth from their holes." Bruce, who recognised the Hyrax as the "animal erroneously called by our translators *cuniculus*, the rabbit or coney," says of it that "in Arabia and Syria he is called Israel's sheep, or Gannim Israel, for what reason I know not, unless it be chiefly from his frequenting the rocks of Horeb and Sinai, where the children of Israel made their forty years' peregrination." He kept one of these animals in con-

finement, his principal reason for so doing being to discover whether it chewed the cud, and came to the erroneous conclusion that it certainly did so; but he also had the odd idea that the animal must be carnivorous, and tried sundry experiments in his endeavour to prove this to be the fact, such as shutting it up in a cage with a small chicken, "after omitting feeding him a whole day," and appears to have been surprised when the next morning the chicken was unhurt, "though the ashkoko came to me with great signs of having suffered from hunger." He gives a description of the animal and its habits as he saw it among the rocks, from which we extract the following passage:—"They do not stand upright upon their feet, but seem to steal along as in fear, their belly being nearly close to the ground, advancing a few steps at a time and then pausing. They have something very mild, feeble-like, and timid in their deportment, are gentle and easily tamed, though when roughly handled at first they bite very severely." Those who take an interest in these odd little animals have an opportunity of making the acquaintance of two of them in the flesh, as both *H. capensis* and *H. dorsalis* have representatives living at the present time in the small mammal house at the Zoo. Descriptions of both of these species can be found in the *Proceedings of the Zoological Society*. *H. capensis* was described by Mr. Rudston Read so long ago as 1835, and from his account we gather that he found it living

in families in hollows and crevices of rocks, both on the summits and sides of hills, as well as near the seashore, even a little above high-water mark; that in winter it is fond of coming out of its hole and sunning itself on the lee side of a rock, and in summer of enjoying the breeze on the top; but that in both instances, as well as when it feeds, a sentinel, generally an old male, is on the look-out, which gives notice of the approach of danger by a shrill prolonged cry. It would appear to make an amusing pet, if taken young and allowed to run about the house, and is described as being remarkably clean in its habits, and inclined to be sociable, but if shut up, to become savage and snarling. Layard, in his *Birds of South Africa*, states that Verreaux's eagle is called Dassie Vanger (coney-eater) by the colonists, from feeding principally on the coney or rock-rabbit, *H. capensis*. *H. dorsalis* was described by Mr. Louis Fraser in 1852 from a specimen obtained from the island of Fernando Po; he tells us that its native name is 'Nybar, that it is nocturnal in its habits, and no doubt common, as its loud cry of ccurr-ccurr-ccurr may be heard every evening after dark during the commencement of the rains, and that the natives say that it sleeps in the trees all day, and feeds upon leaves at night, but is very difficult to find.

ZEBRAS.

(Oct. 7, 1893.)

AMONG the rarer animals that have recently died in the Zoo, certainly not the least noticeable were the common zebras (*Equus zebra*) of which, until in 1892, the Society was fortunate enough to possess two specimens, a male and a female, the former obtained so long ago as December 11, 1886, while the latter was "received in exchange" July 23, 1889.

The term "common" is certainly not well applied in the case of this zebra, as it was always the rarest of the three South African zebras, and is now fast verging on extinction. "True zebra," or "mountain zebra," names which have been applied to it, are less misleading; the latter, indeed, seems to us the best of all, as the animal is essentially an inhabitant of mountainous districts. In menageries the common zebra has always been rare; and we believe that the Zoological Society have had but two specimens in their possession before the pair which have lately died, Burchell's zebra (*Equus Burchelli*), an inhabitant of the plains and open country, being

the animal generally seen in captivity, and popularly known as "the zebra."

Three species of zebra are indigenous to, and formerly abounded in, South Africa—namely, the common zebra, which inhabits the mountainous districts of Cape Colony, where, as we have said, it is fast verging on extinction; Burchell's zebra, still found in considerable numbers north of the Orange River, beyond which, in a southerly direction, its range apparently never extended, at all events, in historical times; and, lastly, the quagga, now nearly if not actually extinct, which ranged no further north than the Vaal River. All three species have been from time to time represented at the Zoo; but we fear that it is hardly within the bounds of possibility that a live quagga should ever again be seen there. The death of both the common zebras is most unfortunate, and we fear that they will not be easily replaced. As they stood in stalls adjoining those of the Burchell's zebras, the difference in form, colouration, and markings between the two species could be easily observed. The common zebras are far the most asinine in appearance, having longer ears, shorter manes, and less hair on their tails than their allies, the Burchell's zebras; they are also smaller. Perhaps the most noticeable difference, however, between the two species is in the colour and markings, the common zebra being white striped with black, with the exception of its nose, which is bright bay, the stripes extending to the hoofs;

while in Burchell's zebra the ground colour of the body is a yellowish-white, with broad and narrow stripes of black and brown, the legs being nearly white and usually unstriped; but, as is the case with one of the animals at the Zoo, the stripes in some cases extend to the hoofs, and to this variety the name *Equus Chapmanni* has been given. However, to quote Sir W. H. Flower, "perhaps the most constant and obvious distinction between the species is the arrangement of the stripes on the hinder part of the back, where in the common zebra there are a number of short transverse bands leading to the median longitudinal dorsal stripe, and unconnected with the uppermost of the broad stripes, which pass obliquely across the haunch from the flanks towards the root of the tail"; a difference which must strike the least observant when the animals are seen side by side. Though the common zebra is only found quite in the South of Africa, within Cape Colony, a nearly allied species, named *Equus Grevyi* by M. Milne-Edwards, has within the last few years been discovered in Northern Somali Land, the type-specimen having been sent to the Jardin des Plantes, in Paris, in the year 1882, since which time several skins have been received in Europe, but, we believe, no other living specimen. In *Equus Grevyi* the stripes, though they are arranged very much as they are in the common zebra, are finer and more numerous. When the new zebra was first brought to notice Sir W. H. Flower was

inclined to think that it was not specifically distinct from *Equus zebra*; but, in June, 1890, Dr. Sclater, at a meeting of the Zoological Society, exhibited, and made some remarks on, the skin of one of these animals which he had received from Somali Land, when he said that he had again examined the typical example of this species, now mounted in the new gallery of the Jardin des Plantes, and was still more confident of its distinctness, as shown by the narrowness of the black stripes, the difference of the markings, and the white spaces on the forehead and on each side of the dorsal stripe in the northern species. Whether it is specifically distinct or not, to again quote Sir W. H. Flower, "it is curious that the most northern and the most southern of the districts inhabited by zebras both contain identical or closely-allied species, while the intermediate territory is occupied by a wholly different form—*Equus Burchelli*."

The rapidity with which the different zebras have been exterminated, owing to the advance of civilisation in South Africa, is shown by reference to such works as that of Sir Cornwallis Harris, written in 1840, in which the author tells us that the quagga was at that time found in "interminable herds," bands of many hundreds being frequently seen; while he describes Burchell's zebra as congregating in herds of 80 or 100, and abounding to a great extent; but, now after the expiration of but fifty years, the one

species is extinct or practically so, while the other has been driven much further afield, and its numbers are yearly being reduced. This author's description of the common zebra is well worth repeating. He says: "Seeking the wildest and most sequestered spots, the haughty troops are exceedingly difficult to approach, as well on account of their watchful habits and extreme agility and fleetness of foot as from the abrupt and inaccessible nature of their highland abode. Under the special charge of a sentinel, so posted on some adjacent crag as to command a view of every avenue of approach, the chequered herd whom 'painted skins adorn,' is to be viewed perambulating some rocky ledge, on which the rifle ball alone can reach them. No sooner has the note of alarm been sounded by the vedette, than, pricking their long ears, the whole flock hurry forward to ascertain the nature of the approaching danger, and, having gazed a moment at the advancing hunter, whisking their brindled tails aloft, helter-skelter away they thunder, down craggy precipices and over yawning ravines, where no less agile foot could dare to follow them." While of Burchell's zebra he says: "Fierce, strong, fleet, and surpassingly beautiful, there is, perhaps, no quadruped in the creation, not even excepting the mountain zebra, more splendidly attired, or presenting a picture of more singularly attractive beauty."

Zebras are by no means amiable animals, and,

though many of the stories told of their ferocity are doubtless much exaggerated, they have so far not proved themselves amenable to domestication. In the catalogue of the African Museum, dispersed in 1838, Burchell's zebra was described as "an animal that admits of being tamed to a certain extent with considerable facility"; it was said that "occasionally a half-domesticated specimen was exposed for sale at Cape Town, with a rider on his back"; and it was, however, added that the persons who had most "opportunities of becoming acquainted with its character regard it, even in the most tractable state to which it has yet been reduced, as wicked, treacherous, obstinate, and fickle"—a true character, no doubt, and one which could be applied with equal justice to both of the other species. At all events, the fact remains that zebras have not been domesticated, our occupation of the Cape having, unfortunately, had a very different effect from that prophesied by the author of the "Naturalist's Pocket Magazine," who in the year 1800 wrote:—"Should the Cape of Good Hope, which we have recently taken from the Dutch, continue in our possession, the period of this animal's being tamed and rendered serviceable may probably be not very far distant"—the species to which he referred being apparently the common zebra, of which a by no means bad figure is given, notwithstanding the fact that the artist has coloured the animal's stripes a bright red.

BIRDS.

BOWER-BIRDS.

(May 25, 1889.)

AN extremely interesting and amusing sight is provided for visitors to the Zoo during the present warm spring weather by the bower-birds confined in the first compartment of the Western Aviary, as they are busy about their bower, the peculiar structure from which they take their name.

The bower-birds belong to a group of Australian birds, which also includes the cat-birds and regent-birds, famous for their peculiar habit of constructing on the ground a bower of sticks and other substances, not as a nesting place, but simply for purposes of love-making and play, their nests being built in trees. These bowers are most peculiar structures; and, though differing both in construction and decoration according to the species of the architect, have very much in common. Little was known of the habits of bower-birds until Mr. Gould published his work on the Birds of Australia, and that famous ornithologist not only gave to the world an excellent

account of the habits of these birds and their allies, but also brought home specimens of their architecture, several of which are now at the Natural History Museum at South Kensington, and, as they are placed together in one case, the difference between them can be appreciated at a glance. All of them are, as we have said, built upon the ground, and are mainly composed of sticks, and are more or less decorated with shells, bones, and pebbles, and, in the case of the Silky Bower-bird, with bright-coloured feathers worked into the structure. Like our own ravens and jackdaws, the bower-birds appear to be fond of picking up unconsidered trifles, as Mr. Gould tells us he found in one bower a neatly-worked stone tomahawk, and the natives are in the habit of searching the birds' bowers, often with success, for objects lost in the bush. At the Zoological Gardens there are at the present time specimens of two species—the Silky Bower-bird (*Ptilonorhynchus violaceus*) and the Spotted Bower-bird (*Chlamydodera maculata*)—and the former are now amusing themselves by bower-building. There are in the aviary nine or ten of these birds, the whole of them, with two exceptions, being cocks, in different stages of plumage; and it is worthy of remark that the male and female are utterly unlike, the former when in adult plumage being of a beautiful glossy blue-black, with a brilliant sapphire eye, while the latter is, by comparison, but a dull bird, being greenish-brown, with a spotted, or rather spangled,

breast. The young cocks much resemble the hens ; in fact, the only noticeable difference is that the green in their plumage is brighter. They do not obtain their full adult plumage until their third year.

Among all the Society's specimens there is but one cock in full adult plumage, though another has nearly attained to it ; and the former is apparently the principal bower-builder, and extremely interesting it is to watch his performance. The bower is made of sticks, which are cut from a birch-broom and supplied to him for the purpose, placed on end in the ground, and so arranged as almost to form an arch about a foot in length, open at both ends, and is—probably, among other reasons, for want of material—by no means so perfect a structure as those to be seen at the Museum, though it is never for two days alike, one peculiarity of these birds being that they are, to all appearance, never satisfied with their work, as they are constantly pulling it to pieces and rebuilding it. The decoration in this case is especially poor ; but this is not the fault of the bird, as he has made use of all the materials at his command ; as these consist only of a few oyster-shells and suchlike odds and ends, the effect is doubtless not as good as it might be if his supplies were brighter and more varied. However, as often as feathers or pieces of ribbon are given to him the mice, which swarm in the Gardens, appropriate them, thus rendering the brightening of the

structure of the bower almost an impossibility. His ornaments, such as they are, are arranged on the ground at each entrance, and apparently afford him great delight, as he is constantly moving and rearranging them. Whenever the bower has been satisfactorily arranged, the cock politely invites one of the hens to enter, which she does and squats down, and then begins a most amusing performance, as he erects his feathers and dances round the bower with most ludicrous bows and contortions, occasionally picking up a shell or other ornament, and carrying it round in his bill, and this exercise he continues for some time. The habit of destroying and rebuilding the bower is, from the visitor's point of view, particularly annoying, as it is most disappointing on paying a visit to the birds to find that they are simply, after their usual manner, flying backwards and forwards through their cage, apparently intent on obtaining as much exercise as possible, and with no more idea of bower-building and decoration than have their unæsthetic fellow-lodgers, the Hill Mynahs. When seen in their builders' native country these bird-built bowers must be very beautiful. That of the Spotted Bower-bird has been described as "beautifully lined with tall grasses, so disposed that the heads nearly meet, and the decorations are very profuse." while that of the Regent-bird is said to be ornamented with "berries of various colours, blue, red, and black, which give it when fresh a very pretty appearance. Besides these,

there were several newly-picked leaves and young shoots of a pinkish colour, the whole showing a decided taste for the beautiful." In comparison with these the bowers made by the birds at the Zoo of birch twigs cut from an old broom and decorated with pieces of oyster shell are much what a heap of dry bones is to a living animal—nevertheless, such as they are, they are very interesting and well worth a visit.

TUFTED UMBRES.

(Feb. 1, 1890.)

THE most noticeable addition that has lately been made to the menagerie in Regent's Park consists of four tufted umbres (*Scopus umbretta*), purchased by the Society on January 7 last. These curious-looking brown birds, though from the very quietness of their plumage they have little about them to attract the attention of the ordinary visitor to the Gardens, are in reality extremely interesting. They belong to the order *Herodiones*, in which they are placed between the herons and the storks. They are natives of South Africa, ranging as far North as the Zambesi river on the East and Benguela Land on the West. While widely distributed over this region, they appear to be only locally common; for example—we quote from Layard's "Birds of South Africa"—Captain Trevelyan records the umbre as common about the vleys near King William's Town, "where he has sometimes seen as many as five or six together;" and Majors Butler and Fielden and Captain Reid state that near Newcastle it was a common bird in vleys and along sluggish

streams; while, according to Mr. Ayres, it is spread all over Natal, "but is not numerous, and is always seen singly;" and, again, Mr. Andersson tells us that "this queer and sombre-looking bird is pretty generally diffused throughout Damara Land and Great Namaqua Land during the rainy season, but is nowhere numerous."

The umbre is known in South Africa as the hammerkop or hammer-head—a name which was doubtless suggested by its appearance, as its curiously-shaped beak and the tuft on its head look comically like a hammer. It frequents marshes, rivers, and pools, and feeds upon fish and frogs, worms, snails, and insects, and is said to watch for fish with its neck drawn in much like a heron.

In flight its neck and legs are carried straight out. Mr. Layard, who has given the best description of this bird and its habits, describes it as a "strange, weird bird, flitting about with great activity in the dusk of the evening;" and he adds that "at times, when two or three are feeding in the same pool, they will execute a singular dance, skipping round one another, opening and closing their wings, and performing strange antics." The hammerkop's nest is an extraordinary structure, of very considerable size, with a domed roof, the whole being built of sticks—of which some nests contain at least a large cartload—and the inside neatly plastered with mud, and so strong is the construction that the roof will bear the weight

of a "large, heavy man" without collapsing; the entrance is through a small hole, generally placed in the most inaccessible side. These nests are placed on trees or rocky ledges, and are occupied year after year, being added to or repaired as required.

The birds have a curious habit of decorating their nests; on which subject we again quote Mr. Layard, who says:—"About some that we visited we found brass and bone buttons, bits of crockery; bleached bones, &c. Mr. Jackson said if a 'Tottie' lost his knife or tinder-box on the farm, or within some miles of the place, he made a point of examining the hammerkops' nests, and frequently with success; the birds, like the Bower-birds of Australia, embellishing their dwellings with any glittering or bright-coloured thing they can pick up." Sir John Kirk describes the nests as colossal, and says that they sometimes measure six feet in diameter; and he tells us that the Africans look on this bird as unfit for food, and also as sacred, or as possessing the power of witchcraft, and that it is considered unlucky to injure it.

The tufted umbres now in the Zoo are not the first of their kind that have been in the possession of the Society, as some few years since a solitary specimen was acquired which lived in the Gardens for something like twelve months, and became extremely tame; but, with this single exception, they are new to the collection. They are in the

Eastern Aviary, well known to most visitors as the home of the hornbills, though at present they are practically invisible without the aid of the keeper, as they are confined behind the glass at the back of the cage, an arrangement which is, of course, only temporary. Though they appear to be in very good health, they have by no means got over the wear and tear of their journey, their plumage being filthy and broken, with the result that they have but little beauty to boast of. When, however, after their moult they obtain their new plumage they will be, though quaint and sombre, far from ugly birds, their general colour being a warm glossy brown. They are fed on fish, which they devour greedily, and they have a peculiar and very noticeable habit of standing in their water-pan after being fed, and feeling about with one foot as if searching for some living creature at the bottom—a searching habit which is, we believe, common to the species.

GREAT BUSTARDS.

(May 10, 1890.)

FOUR great bustards (*Otis tarda*), purchased April 11, are among the recent additions to the menagerie which will be of general interest. These birds, all of them males, have been received in splendid health and plumage, and certainly do credit to those who had charge of their travelling arrangements. They are confined in one of the inclosures opposite to the Monkey-house, among the cranes, where they have room to move about and show themselves, and can be easily observed.

The great bustard, though formerly fairly plentiful in this country, is now unfortunately only an occasional visitor, as, like many other members of our native fauna, it has fallen a victim to increasing population and advancing civilisation, with the consequent extension of cultivated land and improved methods of agriculture, or, in the words of a writer in the early part of the century, "the increased cultivation of the country and the extreme delicacy of the flesh occasioned great havock with this species." It is essentially a bird of the plains and downs, delighting in open country, and was formerly found in considerable number on

the warrens or "brecks" of Norfolk and Suffolk, where it survived longer than in any other part of the island; the moors of Haddingtonshire and Berwickshire, the wolds of Yorkshire and Lincolnshire, Newmarket and Royston Heaths, on the borders of Cambridgeshire, together with the downs of Berkshire, Wiltshire, Dorsetshire, Hampshire, and Sussex. At the present time, though no longer an inhabitant of the British Islands, it is found in Europe, in Germany, and Russia, on the steppes of the Danubian and Black Sea districts, and in Spain.

Among early references to this bird may be noticed that of Hector Boëce, or Boëthius, a Scottish historian, who, writing in 1526, says:—"We have, moreover, another foule in Mers, more strange and uncouth than all those afore-mentioned, called a Gustard, fully so great as a swanne, but in colour of feathers and taste of fleshe little differing from a Partriche; howbeit these byrdes are not very common, neyther to be seen in all places." In the Northumberland Household Book, 1512, the following mention of them occurs:—"Item.—Bustardes for my Lordes own mees at Principal Feestes and non other tyme except my Lordes Commandment be otherwyse"; from which it would appear that they were highly valued, as certainly was the case in the next century; for in Willoughby's Ornithology (1678) the following passage occurs:—"Though some discommend their flesh, yet with us it is esteemed both delicate and

wholesome. Hence, but chiefly for its rarity, the bustard sells very dear, serving only to furnish Prince's and great men's tables, at feasts and public entertainments." This author also tells us that "on Newmarket and Royston Heaths, in Cambridgeshire and Suffolk, and elsewhere in wasts and plains, they are found with us." In the Household Books of the L'Estranges of Hunstanton, in Norfolk, in the "Privy Purse Accounts" for the year 1527, there is the following entry:—

The xljst weke.

Wedynsday.—Item viij malards, a bustard and j hernsewe kyllled wt ye crosbowe.

And again, in the year 1530:—

Itm in reward the xxvth day of July to Baxter's Svnt of Stannewgh for bryngyng of ij yong busterds ij^d.

One Dr. Thomas Muffet, of Bulbridge, near Wilton, in Wiltshire, who died in 1590, wrote as follows:—

Bistards, or Bustards (so called for their slow pace and heavy flying), or, as the Scots term them, Gusetards, that is to say, slow geese, feed upon flesh, livers, and young lambs out of sowing time and in harvest time, then they feed upon pure corn. In the summer, towards the ripening of corn, I have seen half a dozen of them lie in a wheat-field fattening themselves (as a deer will doe) with ease and eating. . . . Chuse the youngest and fattest about Allhallowtide (for then they are best) and diet him a day or two . . . then let him bleed to death in the neck veins, and having hung three or four days in a cool place out of the moonshine, either rost or bake it as you do a Turkie, and it will prove both a dainty and wholesome meat.

The idea that bustards eat young lambs, &c., no doubt, as remarked by Mr. Howard Saunders, "arose from a confusion—not uncommon at the present day—between the names *Bustard* and *Buzzard*." In 1713 Ray wrote:—"In campis spatiosis circa Novum Mercatum et Royston, oppida in agro Cantabrigiensi, inque planitie, ut audio, Salisburiensi, et alibi in vastis et apertis locis, invenitur." And in 1763 Dr. Brookes tells us:—"This bird is bred in several parts of Europe, and particularly in England, especially on Salisbury Plain, Newmarket and Royston Heaths, in Cambridgeshire, and Suffolk, for it delights in open spaces. The flesh is in high esteem, and perhaps the more so because it is not very easy to come at." This author further tells us that "they take them with a hook baited with an apple or flesh." In 1770 Gilbert White, in a letter written from Ringmer, near Lewes, to the Hon. Daines Barrington, says, "There are bustards on the wide downs near Brightelmstone"; in another place he tells us, "Bustards when seen on the downs resemble fallow deer at a distance." In the early years of the present century the species had become very scarce in this country. Montagu, in his "Ornithological Dictionary," published in 1802, says that on Salisbury Plain it had become "very scarce within these few years," from the great price given for the eggs and young to hatch and rear in confinement, half a guinea being no unusual price for an egg, and ten or twelve guineas

for young birds not full-grown, while in 1813 he stated that he was informed by the shepherds that they had not been seen for the last two or three years in their favourite haunts on the Wiltshire Downs.

The actual date of the disappearance of the bustard from its various haunts in this country is not known except in the case of Yorkshire, Norfolk, and Suffolk, in the former of which counties it is believed that the last hen bird was trapped on Sir W. Strickland's estate at Boynton, near Bridlington, in 1832 or 1833. In Norfolk and Suffolk, however, it managed to hold its own in some numbers for a considerable time after it was practically extinct in other parts, and, as it found a most careful historian in the late Mr. Stevenson, of Norwich, the whole of the facts of its disappearance have been preserved and can be found in that author's "*Birds of Norfolk*," from which we gather the following facts:—

Two "droves" existed, one having its headquarters in the open country round Swaffham, and the other near Thetford. There is reason to believe that a nest found on the borders of Thetford Warren in the year 1832 was the last known in Suffolk, and a single bird observed later in the summer of the same year on Icklingham Heath was the sole survivor in that once noted locality. The Norfolk birds were now the last of the indigenous race, but they did not long survive.

In the spring of 1833 three females resorted to

Great Massingham Heath for incubation ; their eggs consisted of two pairs and a single one ; these were taken away under the impression, possibly a mistaken one, that there was no male bird, and that, therefore, they were good for nothing. A small flock of hen bustards, including the parents of the eggs mentioned, continued to occupy the country round Swaffham for some years longer, but there is no record of a cock having been seen, and the actual date of the death of the last survivor is not known with certainty, but was probably in the year 1838, though "several persons believe, and with some show of reason, that a bird, or even two birds, lingered on till 1843 or 1845."

Thus, as Mr. Stevenson observes, the failure of "heirs male" was the final cause of the extinction of this noble indigenous species, as is so often the case in the human race with some great historic name. The main cause of the diminution in the number of bustards was, no doubt, primarily the improved methods of agriculture, and the substitution of the drill for the old method of sowing broadcast, on which followed the horse hoe, with the result that "every nest made by a bustard in a wheat-field was sure to be discovered, perhaps in time to avert instantaneous destruction from the horses' feet or the hoe blades, perhaps (and this probably much the more often), only when the eggs had been driven over and smashed, and their contents were pouring out on the ground. But even in the first case, instantaneous destruction being

avoided, the eggs were generally taken up by the driver of the hoe," and "appear often to have been preserved as natural curiosities to lie with grotesquely shaped flints and petrified echini (the 'fairies' loaves' of the district) on the parlour mantelpiece or bookshelf till they met with the usual fate of such fragile articles." But improvement in agriculture was not alone to blame, as we read of a gamekeeper being allowed, "not only to go in quest of them with a swivel-gun mounted on a wheelbarrow screened with boughs, a parchment stalking-horse, and similar devices, but even to construct masked batteries of large duck-guns placed so as to concentrate their fire upon a spot strewed with turnips. The guns forming his batteries had their triggers attached to a cord perhaps half a mile long, and the shepherds and other farm-labourers on the ground were instructed by him to pull the cord whenever they saw the bustards within range."

On one occasion this man is said to have succeeded in killing no less than seven at one discharge, the birds being presented to the Prince of Wales (George IV.), the Duke of York, and others. And we are sorry to say that the gifts are reported to have "had the effect, in some degree, of procuring the berth of head-gamekeeper at Windsor" for the son of this arch bustard-slayer.

Every one has probably heard, and most people firmly believe, that bustards were formerly coursed by greyhounds; but, although the statement that

they were so taken has been repeated by author after author, there would appear to be no evidence of its truth. Stevenson tells us that, though "the Swaffham coursing meeting was one of the most celebrated in the whole country, and in the open districts of both counties (Norfolk and Suffolk) the sport of coursing was formerly most extensively followed, greyhounds being very generally kept, yet none of the older inhabitants have ever heard, except from books, that bustards were taken by dogs. If ever the coursing of bustards by greyhounds were practised in any part of England, it could only have been when the birds were very young, or, being old, had moulted out their quill feathers." Still the statements of the older authors are so explicit that one can only wonder what could have given rise to the fable. The following are a few examples. Drayton, in the "Polyolbion," 25th Song, mentions

The big-boan'd Bustard then, whose body bears that size
That he against the wind must run ere he can rise.

In a "History of Animals," by John Hill, M.D., published in 1752, we find the following explicit statement:—"This is a bird more nearly allied to the ostrich and cassowary kind than people are aware, and, like them, it runs at a prodigious rate, and but rarely rises on the wing. . . . We have this bird in many parts of England, where it feeds on vegetables, and on corn when it can get at it. I have seen great numbers of them on the downs in Sussex; they run away at the approach

of men, but rarely, and indeed difficultly, take wing. They are often taken by greyhounds in a fair course, in the manner of a hare. Their flesh is very well tasted."

In the "Naturalist's Pocket Magazine," published in 1800, the plates dated 1798, the author says:—"But tho' they cannot be reached by a fowling-piece, they are sometimes run down by greyhounds. Being voracious and greedy, they often sacrifice their safety to their appetites; and, as they are generally very fat, they are unable to fly without much preparation. When, therefore, the greyhounds come within a certain distance, the bustards run off, clap their wings, and endeavour to gather under them air enough to rise. In the meantime the dogs are continually gaining ground, till at last it is too late for flight. However, notwithstanding the sluggishness of their usual pace, they can when in danger run very fast, and once fairly on the wing are able to fly several miles without resting."

Dr. Brookes says "they take them with greyhounds, which often catch them before they are able to rise," which, be it observed, would hardly appear to be the same thing as coursing them.

Lastly, Bewick wrote:—"They are slow in taking wing, but run with great rapidity, and when young are sometimes taken with greyhounds, which pursue them with great avidity. The chase is said to afford excellent diversion." And in his woodcut of the great bustard he shows in the

background a mounted sportsman running a bustard with a brace of greyhounds, the bird using both legs and wings. That they were in old days valued for their power of flight is proved by the following extract from the "Booke of Falconrie or Hawkinge," published in 1611:—"There is yet another kind of flight to the field called the great flight, as to the cranes, wild geese, bustard, bird of paradise, bittors, shovelars, hearons, and many other such like, and these you may flee from the fist, which is properly termed the source. Nevertheless, in this kind of hawking, which is called the great flight, the falcons or other hawkes cannot well accomplish their flight at the cranes, bustard, or such like, unlesse they have the help of some spaniell, or such dogge, wel inured and taught for that purpose with your hawke. Forasmuch as great flights require pleasant ayde and assistance, yea and that with great diligence."

Space will only allow us to mention one other point in the economy of the bustard about which there has been a great deal of controversy, namely, the gular pouch found in the male. Most extraordinary stories have been told of the use of this pouch; for example, Bewick wrote, the male

is furnished with a sac or pouch, situated in the fore part of the neck, and capable of containing about two quarts; the entrance to it is immediately under the tongue. This singular reservoir was first discovered by Dr. Douglas, who supposes that the bird fills it with water as a supply in the midst of those dreary plains where it is accustomed to

wander ; it likewise makes a further use of it in defending itself against the attacks of birds of prey ; on such occasions it throws out the water with such violence as not unfrequently to baffle the pursuit of the enemy.

The whole of this statement as to the use of the pouch is purely imaginary, as there is little or no doubt that the pouch, which does not appear to have been present in every specimen dissected, is found only in the adult during the breeding season, contracting during the non-breeding season "so considerably as to become insignificant." It is probably inflated at will when the bird is "showing off," at which time he puts himself into the most extraordinary postures imaginable, "unexcelled for a love display by any of the game birds."

THE MOT-MOT.

(May 17, 1890.)

THE Parrot-house is always well worth a visit, and were its inmates less noisy would, no doubt, be much more frequented than it is, as it contains not only an excellent collection of parrots, of all sorts and sizes, but also many other very beautiful and interesting birds. At the present time, however, a bird of more than ordinary interest is to be seen in this house which, though not "new to the collection," will certainly be new to a very large majority of the present visitors to the Zoo, as it is a very long time—how long we cannot say with certainty, but at least twenty years—since the last specimen died there. The bird in question is a mot-mot, presented about a week since, and is to be seen in the large cage nearest to the keeper's room. It has not yet been labelled, but is, we believe, *Momotus brasiliensis*. It is an extremely striking, though not very brilliantly coloured, bird, about the size of a jay, with a long tail; its brightest colour, a most beautiful blue, forms a band round the crown of its head, which is black, and there are smaller patches on its cheeks; it has a bold

bright eye, the iris of which is red. Its tail, however, is without doubt its most noticeable feature, not so much from its length and colour as from the extraordinary habit the bird possesses, especially, it would seem, when excited, of swinging it from side to side after the manner, and with the regularity, of the pendulum of a clock, occasionally varying the monotony of the proceeding by jerking it straight up over its back—an odd habit, calculated to attract the attention of the least observant. The mot-mot's tail has the further peculiarity that the two middle feathers, which are longer than the others, are racket-shaped at the end—that is to say, that for about an inch the feather is perfect, and then for an inch, or rather more, the shaft is entirely denuded of web. This peculiarity has given rise to some controversy, one side contending that it is natural, while the other avers that it is artificial, being caused by the bird itself.

Waterton first drew attention to the fact that the bird acted as its own barber, and described the process as follows: "This bird [the mot-mot, or houtou as he called it] seems to suppose that its beauty can be increased by trimming the tail, which undergoes the same operation as one's hair in a barber's shop, only with this difference, that it uses its own beak, which is serrated, in lieu of a pair of scissors. As soon as its tail is full-grown, it begins about an inch from the extremity of the two longest feathers in it, making a gap about an inch long. Both male and female adonise their

tails in this manner, which gives them a remarkable appearance amongst all other birds. While we consider the tail of the houtou blemished and defective, were he to come amongst us he would probably consider our heads, cropped and bald, in no better light."

Dr. Murie, writing on the other side, said: "The story has found credence that they nibble off the occasionally absent vanes of the long middle tail-feathers; but this notion has been contradicted." This brought forth a reply from Mr. Salvin, which can be found in the "Proceedings of the Zoological Society for 1873, and which appears to us to be conclusive. He tells us that he noticed a specimen which lived in one of the cages in the Parrot-house all by itself, and adds, "For a long time its tail had perfect spatules; but towards the end of its life I noticed that the median feathers were no longer trimmed with such precision; and on looking at its beak I noticed that, from some cause or other, it did not close properly, but gaped slightly at the tip, and had thus become unfit for removing the vanes of the feathers." He wrote to Mr. Bartlett on the subject, who replied, "During the several years the mot-mot lived here I had many opportunities of watching its habits, and I have seen the bird in the act of picking off the webs of the central feathers of its tail, and have taken from the bottom of its cage the fragments of web that fell from the bird's bill. As the bird lived here for some years, its bill got rather out of

order; that is, it did not close properly at the point; and consequently the picking off the web at last was improperly performed, and the two sides of the tail-feather presented an unequal and unfinished appearance." Whether this racket-shaped end to the tail be natural or artificial, it is most noticeable in the specimen at the Zoo. Another peculiarity of the bird, though one not ordinarily visible, is the tongue, which is long, "bifid for half an inch, and feathered at the sides," and much resembles that of the toucan, with which the mot-mots were formerly classed.

The mot-mots are natives of tropical America, their range extending from Mexico, in the North, to Brazil and Paraguay, in the South; they are solitary forest-haunting birds. The following is Waterton's account of their habits, as noticed by him in Demerara: "He who wishes to observe this handsome bird in his native haunts must be in the forest at the morning's dawn. The houtou shuns the society of man, the plantations and cultivated parts are too much disturbed to engage it to settle there. The thick and gloomy forests are the places preferred by the solitary houtou. In those far-extending wilds about daybreak, you hear him articulate in a distinct and mournful tone, 'Houtou, houtou.' Move cautiously on to where the sound proceeds from, and you will see him sitting in the underwood, about a couple of yards from the ground, his tail moving up and down every time he articulates 'houtou.' He lives on insects and the

berries from the underwood, and very rarely is seen in the lofty trees, except the bastard silolabi-tree, the fruit of which is grateful to him. He makes no nest, but rears his young in a hole in the sand, generally on the side of a hill."

In captivity the mot-mot may fairly be said to be omnivorous, as Dr. Murie tells us that it "will then eat bread, raw meat, oranges, water-melons, small birds, mice, lizards, snakes, cockroaches," &c. He further tells us that "in pouncing on these latter, they afterwards strike them violently against the ground or perch."

The bird at the Zoo is not, so far as we are aware, supplied with mice, lizards, or snakes—cockroaches, we should imagine, it could have for the asking, as the large American species commonly known as the "ship's cockroach" swarms in many of the houses; but the bird's food consists of raw meat, boiled rice, bread, fruit, and vegetables, on which we hope it may live and thrive as well as did its predecessor, mentioned by Messrs. Salvin and Bartlett.

OWLS.

(Oct. 4, 1890.)

VERY few people, few even of the regular frequenters of the Gardens, are, we imagine, aware of the existence of the "owls' cages" at the Zoo. Indeed, we have many times heard the remark that it was extraordinary that the Society should possess no owls except eagle owls—birds of this species being well known to all visitors from the position of their cage. This ignorance, however, is not to be wondered at, as the cages in question are placed at the back of the "llamas' house," perhaps the most out-of-the-way spot in the Gardens; but they generally contain an interesting little collection of owls, and amongst them examples of most of the commoner of our native species.

At the present time ten species are represented, of which the following are British: the barn owl, the tawny or wood owl, the long-eared owl, and the short-eared owl; among the most noticeable of the others being the Oriental eagle owl from Java, and several burrowing owls from Buenos Ayres—the latter the most comically consequential looking little fellows imaginable.

Much may be learned from a visit to the "owls' cages." For example, it is hardly matter of common knowledge that the barn owl, the commonest and best-known of our British species, has practically a world-wide range, the countries in which it is not found being very few. Yet that it is widely distributed will be palpable to anyone who notices that two birds of this species, the one from the "British Islands," the other from Chili, are confined in the same cage. Again, how many people are aware that owls, when perched, sit with two toes in front of their perch and two behind? This piece of knowledge has most certainly been acquired by very few bird-stuffers, and apparently is not possessed by many writers on birds, or the artists who illustrate their books (curiously enough, neither Yarrell nor his artist appears to have been acquainted with the fact), yet a visit to the Zoo will convince the most sceptical that this habit is possessed by the whole family.

The construction of the owl's foot is peculiar; unlike the well-known foot of the parrot, which has two toes in front and two behind, it, like that of the eagle, or (a more familiar example) the common sparrow, has one toe behind and three in front; but the first of these is capable of much lateral motion, while the fourth, or outer toe, is reversible, and when the bird perches is turned backwards, so that the bird sits on its perch with the two middle toes in front and the two outer

toes behind. But though, as we have said, much may be learned from a visit to the "owls' cages" at the Zoo, unfortunately the vastly important lesson that owls are the farmer's greatest friends, and are practically harmless to the game-preserver, cannot be learnt by observing them in captivity.

In these remarks we refer only to the commoner of the British species, as the snowy owl, the hawk owl, and the eagle owl (which are, without doubt, given to preying on game-birds, hares, &c.), though included in the British list, are of such rare occurrence in this country that they may be left out of consideration altogether.

The food of the owl can be determined with absolute certainty, as the bird swallows its prey, bones, fur, feathers, and all, and afterwards disgorges the indigestible parts in the shape of pellets, numbers of which can always be found near its haunts—a well-known fact, yet one of which neither the farmer nor the gamekeeper takes the slightest notice. Dr. Altum, a German naturalist, examined hundreds of pellets of the barn owl and the tawny owl, among other species, with the following remarkable results:—706 pellets of the barn owl yielded the remains of 16 bats, 3 rats, 2520 mice of sorts, including voles and shrews, 1 mole, and 22 small birds; while 210 pellets of the tawny owl—a bird which, according to most gamekeepers, and even to many writers on game-preserving who should know

better, is a most inveterate poacher—yielded 1 stoat, 6 rats, 371 mice, voles, and shrews, 48 moles, and 18 small birds, to say nothing of beetles and cockchafers; and we are quite sure that anyone trying the same experiment as Dr. Altum will arrive at the same results.

Naturalists have from time immemorial done their best for the owl by describing it in its true character as a mouser and a friend to the farmer, and it is therefore extraordinary that in these days of universal education the usefulness of the owl should still remain as a lesson to be learnt by those for whom it spends its existence in doing good.

Yet so it is, and the unfortunate birds are still persistently destroyed. That the gamekeeper should be an owl-slayer need, however, cause little wonder to those who are acquainted with him and his ways; for we venture to say that there are few people, with his opportunities, at all events, who are so singularly ignorant of natural history as the average gamekeeper. He lives on tradition, and is hard to teach; owls were vermin to his forefathers, and this is sufficient for him. He would rather not argue the matter; vermin they are, and must, therefore, be destroyed. Unfortunately he is often encouraged in his senseless slaughter of these beautiful and harmless birds by his employer, who, in many cases, is more ignorant of everything connected with natural history than himself, and is willing

to pay so much a head for all the "vermin" his keeper can procure. But that farmers should join in the slaughter is curious, and shows most lamentable ignorance; yet many of them will remorselessly shoot an owl whenever they have an opportunity, under the mistaken idea that it will destroy their pigeons, and utterly regardless of the fact that it is doing its best to free their land of rats and mice.

Under these circumstances we are pleased to find that so high an authority as Lord Lilford, the President of the British Ornithologists' Union, has taken up the cudgels in defence of the owl, and his remarks, which are to be found in a recent number of his "Coloured Figures of the Birds of the British Islands," are so trenchant and to the point that they should have the widest possible circulation, and therefore we make no apology for quoting them very fully:—he says:

"I am glad to believe that the minds of game-preservers and gamekeepers are gradually awakening to the fact that in destroying owls in general, and this species (the barn owl) in particular, they are committing acts of the most egregious folly, not only as regards the birds which are the special objects of their care and protection, but also from an agricultural point of view, for these owls not only destroy enormous numbers of rats, mice, and voles, but also take many sparrows and other seed-eating birds from their nocturnal resorts. The stolid and unenlightened gamekeeper

may plead that owls do eat birds, and, as I have just stated, so they do; but if he allows his young hand-reared-game birds to be out of their coops at the time that owls are abroad in search of food, surely the blame for losing them attaches justly to him, and not to the tempted owl. I need hardly say that wild bred game-birds, whilst small enough to be attacked by the barn owl, are carefully stowed away under their mother's wings at the time when the 'bird of night' is on the quest of prey. I have examined hundreds of the pellets cast up by this species, in and under their nesting-places, and never discovered either bones or feathers of any game-bird, the castings consisting mainly of the fur and bones of small mammalia, with feathers and skulls of seed-eating birds, and, occasionally, a few bones and scales of small fishes."

As showing the infinite amount of good done by the barn owl, he adds:—

"A young owl of this species, which I kept as a pet in my school days, on one occasion, when about half-grown, swallowed nine full-grown house mice in rapid succession till the tail of the ninth stuck out of his mouth, and he could do no more; but within three hours he was hungry again, and was barely satisfied with four more of the little quadrupeds. With this appetite and capacity for stowage the numbers of four-footed vermin supplied by a pair of barn owls to a brood of six or seven ravening youngsters may

well be imagined ; I have seen an old pair bring food to their brood seventeen times in half an hour from a rickyard near their nest."

Every right-minded man will sympathise with the writer in his concluding sentences, which are as follows :—

"A great number of these and other owls are massacred and sold to be made into fire-screens and plumes for ladies' hats, barbarities upon which I can hardly trust myself to enlarge. The bird-manglers who devote themselves to this branch of art, almost invariably put glass eyes of the wrong colour into the distorted faces of their victims, and in every way shock all the better feelings of our human nature."

We have little doubt that the constant persecution suffered by these extremely useful birds, and the consequent diminution in their numbers, has much to do with the plague of rats and mice from which so many parts of the country are at present, and have long been, suffering. This is a plague which, if owls were encouraged instead of being destroyed, they would doubtless do much to mitigate ; but at present the unfortunate birds have no chance, their very endeavour leading to their destruction. For example, we were told by a farmer in a highly preserved district that his stacks, being attacked by numberless rats and mice, attracted, as he expressed it, all the owls in the neighbourhood ; the unfortunate birds, in their turn, attracted the keepers, and were every

one of them ruthlessly killed, to his great detriment, but to the benefit of the keepers, whose master paid a fixed sum per head for all "vermin" destroyed on his estate.

In conclusion, we will only add that, whatever may be said about other birds included in the gamekeeper's list of "vermin"—and much may be said for more than one of them—there can be no doubt that the owl should have no place there, but should instead become an object of preservation as one of the best bird friends that the farmer possesses.

OSTRICHES.

(Oct. 22, 1892.)

OSTRICHES have been known to, and their feathers appreciated by, mankind from time immemorial, and it is, therefore, perhaps a little curious that so much romance attached to them as was the case till quite recently. Indeed, we doubt if, even in these days of ostrich farms and incubators, all the old-world fables are entirely exploded. Though probably no one could be found like Cardan, whom an old author tells us "Scalinger do's, upon good grounds, laugh at" because he was "of Opinion that Ostriches had red, blew, and green Feathers, not knowing that they are dyed of these Colours," yet many, we imagine, still have a lingering belief that the stupid birds when pursued do hide their heads in the sand under the impression that they are then hidden from their enemies, and that they are by no means averse to, and are quite capable of assimilating, a diet of stones, horse shoes, copper coins, and such-like trifles. One of the most interesting accounts of the ostrich given by mediæval writers is that of Pierre Belon du Mans, in his "*Histoire de la nature des Oyseaux*," published in Paris in 1555.

This, like all the writer's works, is, for the time in which it was written, eminently free from romance, though no doubt there was some truth in the words of a later writer who said "the protestations which Belonius and some others do make, to say nothing but what they have seen, and the Assurances which they do give of having discovered a great many of the falsities which have been writt before them, have scarce any other effect, than to render the sinceritie of all Travellers very suspect, because that these Censurers of the good Credit and exactness of others, do not give sufficient Cautions of their own." Belon repeated the well-known fables, though not entirely on his own authority, for he wrote of the ostrich :—"Quand on le chasse, il a l'industrië de jecter des pierres avecques les pieds en fuyant, contre ceux qui le pourchassent. Et si d'avanture l'Autruche trouve un buisson, lon dit qu'il est si sot oyseau, que se cachant seulement la teste, pense que tout le reste du corps est en sauveté." And in his "Portraits d'Oyseaux, &c." we find the following quatrain under the figure of this bird :

L'Austruche peut la pierre digerer :
 Et a quasi du Chameau la figure.
 Bien qu'il soit lourd, legiere est son allure :
 Mais a voler ne s'ause aventurer.

From Belon's account it would appear that ostrich-farming is by no means the modern invention that many would have us believe ; for,

after an account of the shops in Alexandria in which he says that more than two hundred ostrich skins with the feathers attached, might be seen in a heap, he goes on to say :—" Et si nous a lon dit qu'ils en nourrissent des privees au païs de Lybië, comme nous faisons noz Oyes, et Cannes, dont les paisans mangent la chair, et ont profit des plumes qu'ils vendent aux estrâgers." A sufficiently wasteful method of ostrich-farming be it observed and one that would hardly pay in these days. His description of the bird is so good and quaint that we give it in full. He begins by saying that Latin authors were doubtful whether it should be considered a terrestrial animal or a bird, and continues :—

Ja n'est il pas oyseau : car il ne se peut eslever de terre pour prendre l'ær. Ausi ses ælles luy servent seulement pour luy ayder à courir. Il n'est pas couvert de poil comme les animaux terrestres, excepté sur les paupières et dessus la teste, et le lōg du col : parquoy on ne le peut bonnement referer estre terrestre, attendu qu'il est couvert de plumes par le corps. Il a un long bec, fort et poinctu. La teste, et le dessus du col est sans beaucoup de plumes, mais couverte de petits poils, comme l'Ostarde. Il a les yeux gros, et noirs, semblables à ceux d'une Chameau. Au reste il a toute la manière d'un Oyseau, excepté qu'il excède tous autres en stature, et qu'il n'a que deux ergots aux pieds, qui sont onglez cōme ceux d'un Chameau, faisant comparaison du grād au petit, du quel il tient beaucoup de merques; car ses pieds sont mols par le dessous, et ne sont point fenduz en doigts, comme ceux des autres oyseaux.

It is, perhaps, needless to point out that the description here given of the bird's feet is

incorrect, as, though the inner toe has a stout and hoof-like claw, the outer one is clawless. If we may believe this author, ostriches must have been commoner in Europe in his time than they are at present, as he says:—"L'Autruche est ja si commune qu'en oultre ce qu'on la cognoist de nom, assui y a peu de gens qui n'en ayent veu."

Leaving ancient history, it may be said that the ostrich, though it does not thrive on a diet of stones, metal, and so forth, is fairly omnivorous, as nothing seems to come amiss to it. Vegetable substances of all sorts, including grain, seeds, and berries, together with beetles, locusts, small birds, and animals, snakes, and lizards, are said to be devoured indiscriminately, and it is a fact that the birds will pick up and swallow almost anything that comes in their way—for example, pieces of wood or metal, stones, cord, glass, indeed, anything that is not too large or too heavy. This habit is, however, often fatal to them. To give only two examples from birds formerly in the Zoo, one is said to have owed its death to the fact that it swallowed part of a parasol, while the other came to its end by the aid of 9½*d.* worth of copper money. Finally, the ostrich, though by no means a pleasant fowl, is not as bad as it was painted by the ancients, and is certainly not guilty of the unnatural conduct attributed to it of leaving its eggs, and therefore its young to take care of themselves, the fact being that not only do the hens, which lay in one nest, relieve one another in

the duty of incubation, but that the male also takes his turn on the nest.

There are just now two ostriches at the Zoo, which are to be seen in the Giraffe House, one purchased in June, and the other, which only arrived on Saturday last. The latter is the property of the Queen, and was, as all readers of the daily papers are doubtless aware, presented to Her Majesty a short time since, and is only in the menagerie "on deposit." It is a remarkably fine specimen, quite dwarfing its neighbour in the adjoining compartment; indeed, we believe that it is the finest bird of its kind that has ever been seen in Regent's Park. We can only hope that Her Majesty will present it to the Society; but, meanwhile, as it is only "on deposit," we should advise those who are interested in ostriches to pay it an early visit. It seems to have borne the journey well, and to be in excellent health.

ARTICULATA.

THE LEAF-INSECT.

(June 1, 1889.)

At the last meeting of the Zoological Society for scientific business, Mr. Sclater called attention to a specimen of a leaf-insect, living in the Society's Insect-house, which had been received from the Seychelles, and presented by Lord Walsingham. He described it as not quite fully developed, but believed it to be referable to *Phyllium gellonus*, Gray. This is an extremely interesting addition to the Society's collection, and will doubtless, as its presence becomes known, induce many persons to pay a visit to the Insect-house.

The leaf-insects, of which but few species are known, belong to the same family (Phasimidæ) as the stick-insects, and both are marvellous illustrations of mimicry in nature. They are all of them nocturnal in their habits, and spend their days resting on trees and bushes, the leaves of which form their food, and their resemblance respectively to the leaves and twigs is so extraordinary

that it is not surprising that they escape the observation of their enemies.

The leaf-insects are most singular; the head and part of the thorax form a stalk, while the abdomen, which is flat, thin, and much dilated, exactly resembles a leaf. The legs, which are six in number, have broad membranous appendages on the thighs, and these are especially noticeable on the fore-legs; the result being that the creature, while resting immovable, has the appearance of a leaf which has been gnawed on both sides by a caterpillar. In the insect at the Zoo this resemblance is most exact, and the illusion is heightened by the colouring, which makes it appear slightly withered at the edges.

It is the habit of the insect to hang back downwards, with the abdomen slightly curled up, and, to quote Mr. Murray, "this habit brings to light another beautiful contrivance for still further heightening its resemblance to a leaf. The upper surface is opaque green, the under surface glossy glittering green, just the reverse of the myrtle or guava leaf, so that by reversing its position, it brings the glossy side up and the dull side down."

The eggs of the Phasimidæ, which are few in number, are large, and covered with a horny shell, at the end of which there is a distinct operculum, and are deposited singly. The insect attains a considerable amount of development before emerging. Mr. Murray tells us that, "after

having reached the form of a six-legged, jointed insect, it emerges from the egg by pushing off the lid. It comes out middle foremost—that is, its head and tail are packed downwards so as to meet each other. The back between these first appears, and they are drawn out next; the legs are extricated last. The colour of the insect at this stage is a reddish yellow, something of the hue of a half-dried beech leaf; for it is to be observed that, although the colour of the insect varies at different periods of its life, it always more or less resembles a leaf at some stage. When it has once settled to eat the leaves on which it is placed, the body speedily becomes bright green.”

The leaf-insect at the Zoo is confined in a glass case in the Insect-house facing the door, and is supplied with a small orange tree on which to rest; the orange is, however, not one of its food-plants, as it refuses to eat the leaves. On its first arrival considerable difficulty was experienced, as the proper plant on which to feed it was unknown, and though many experiments were made they were unsuccessful, as the insect refused everything that was offered to it. At length, however, a dry leaf, discovered in the box in which it arrived, was referred to the authorities at Kew Gardens, who solved the mystery, and it is now supplied with its proper food, and, we believe, feeds well.

Specimens of the leaf-insect are not uncommon in collections; but, after death, the green colour is lost, and the whole insect acquires a yellowish-

brown tint, much the colour of a dry leaf. Living specimens, however, are by no means common, and we believe the present species to be even less common than *Phyllium siccifolium*, of which, according to the Rev. J. G. Wood, "specimens have been hatched in England, have passed into their perfect state, and have lived for some eighteen months."

THE PRAYING-MANTIS.

(June 14, 1890.)

WE have always considered it matter for regret that hard fate, in the shape of want of room and the necessity for a sunny spot with a southern aspect, should have compelled the Society to build their Insect House in such an extremely out-of-the-way corner of the Gardens as that which it occupies, as from its position comparatively few visitors find their way to it, in spite of the fact that it always contains many very interesting animals. Though it is known as the "Insect House," its inhabitants are not entirely confined to insects, or indeed even to invertebrates, as among them are several birds, and two or three examples of the electric eel of South America. Still, invertebrates very largely predominate, and a very good and extremely interesting collection they are. As, indeed, would naturally be expected, the inhabitants of this house are at their best during the summer months, and at the present time the house contains several more than usually interesting animals, in addition to the Lepidoptera (butterflies and moths), which alone always well repay a visit.

Among these we may mention a Tarantula, just received—of which it may be remarked parenthetically that it is not an insect, notwithstanding the popular belief that all “spiders” are insects—and two specimens of the Praying-mantis (*Empusa pauperata*), a native of the South of Europe, also received within a week or so, of which latter alone we propose to treat in this article.

The Mantidæ belong to the order Orthoptera, one of the “oldest families,” be it observed, in the insect world, tracing their descent back to the Upper Devonian period, and are somewhat nearly related to the stick and leaf insects (Phasmidæ), and, like them, afford a marvellous illustration of protective mimicry in nature, their resemblance to the leaves and twigs being so great that it is almost impossible to notice them when they are at rest upon the plants which they frequent. They are most extraordinary-looking creatures, but can be easily distinguished from their relations, the Phasmidæ, by the peculiar structure of their fore-legs, which are long and thick, and marvellously adapted for seizing flies and other insects on which they feed. The femora are thick, grooved on the underside, and furnished with a double row of spines, while the tibiæ, which are by comparison slender, are also armed with spines on the underside, and are so constructed as to close upon the femora “as the blade of a pocket-knife does upon its handle. The efficiency of this implement is shown not only in seizing small insects, which

become an easy prey, but in the combats which the Mantidæ carry on with each other, for a dexterous application of it decapitates an opponent as expeditiously as could be done by a guillotine." These powerful raptorial legs are attached to the extremity of the prothorax, which is very long and capable of being raised nearly at a right angle to the body, which gives them much the appearance of arms. The other two pairs of legs are slender and are used entirely for walking, and in the genus *Empusa*, as may be seen in the specimens in the Zoo, the thighs are ornamented at the ends with curious little leaf-like expansions.

In all the Mantidæ the head, which is triangular, is attached vertically to the thorax by a distinct neck—in *Empusa* it is decorated by a long horn-like projection of the forehead—and is furnished with large oval eyes, and the curious manner in which the creatures turn their heads in all directions intently watching the movements of anything near them is most striking.

The Mantidæ are noticeable, not only for their structural peculiarities, but also for the fact that they are living and walking exponents of the truth that the world is governed by appearances, as from very ancient times wherever they are found—that is, throughout the warmer regions of the world—they have been credited with piety, meekness, and all good qualities, whereas in truth they are the most bloodthirsty creatures imaginable. This extremely mistaken estimate of their character has

arisen from the fact that, especially as they move slowly about, the thorax is raised, as we have said, at an angle to the body, and the large raptorial legs are carried extended and raised—thus fancifully imitating, or rather caricaturing, the position of a person whose hands are clasped in prayer. In many parts of the world they are still regarded with superstitious reverence, and extraordinary stories are told of them—for example, they are believed to be able to indicate coming events, whence their names of “soothsayers” or “prophets,” and in the South of Europe the Praying-mantis is supposed to direct any lost wayfarer, especially a child, into the right way; as Rondelet puts it:—
“*Puero interroganti de viâ altero pede extento rectam monstrat, atque rare vel nunquam fallit.*” Another legend is to the effect that “St. Francis Xavier, on seeing a mantis moving slowly along with its fore-legs raised as if in devotion, desired it to sing the praises of God, which it immediately did in a very beautiful canticle.” Again, we are told that among the Hottentots “the individual upon whom one happens to alight is supposed to have a peculiar degree of sanctity imparted to him, and to be a special favourite of heaven.” As we before remarked, however, all this reverence is sorely misplaced, the whole of the creature’s life being spent in murder and rapine; for, being “fierce, cruel, gormandizing wretches, so far from indulging, as has been fondly supposed, in a state of religious abstraction, they are continually “seek-

ing what they may devour," and the very position which has given them a reputation for sanctity is only assumed to enable them the more readily to seize any unfortunate insect that may come within their reach; and they are by no means particular what that insect may be, as they will with the greatest readiness seize and devour one of their own species, particularly if smaller and weaker than themselves. It is, therefore, not surprising that they are most pugnacious, and indulge in the fiercest encounters on the least possible provocation—or, indeed, without any apparent provocation at all—when "their manœuvres very much resemble those of hussars fighting with sabres, and sometimes one cleaves the other through at a single stroke, or severs the head from the body. During these engagements the wings are generally expanded, and when the battle is over the conqueror devours his antagonist." The performance is curious and amusing, the peculiar shape and carriage of the insects giving them the appearance of dancing with one another. In China and the East we are told that they are fought, like gamecocks, for wagers. The following extract from the work of an American authority says much for their power of endurance:—"We have seen a female decapitated, and with her body partly eaten, slip away from another that was devouring her, and for over an hour afterwards fight as tenaciously and with as much nonchalance as though nothing had happened."

It is, perhaps, needless to say, the character of the Mantidæ being such as it is, that the two specimens at the Zoo are not confined in the same case, as were they placed together the Society would in all probability very shortly possess but one only. They are of different ages, one having arrived at the perfect winged state of maturity, while the other is much more youthful, and it is interesting to compare the two examples. Like all the Orthoptera, the young Mantidæ came into the world fully equipped with six legs, and, except that they are much smaller, differ very little in shape and general appearance from their parents; their wings, however, are entirely wanting. The changes in their development from the larval stage to that of the perfect insect are gradual, being carried out by a series of moults, during which the wings, which first appear under the skin behind the prothorax, increase in size with each successive moult until they attain their full development in the perfect insect. And their wings have this peculiarity, that the upper pair, the tegmina, are hard, and form a covering for the under pair, which latter are so constructed that when the insect is at rest they fold together like a fan. Both tegmina and wings are longer than the abdomen, upon which they rest horizontally, the tegmina being placed one over the other. Though not possessing wings, the young Mantidæ are blessed with voracious appetites, and are fully as fierce and bloodthirsty as their elders—qualities which they

soon display by attacking one another. They are produced from eggs, which are laid by the parent insect in clusters, inclosed in an envelope, which, soft when produced, becomes hard by exposure to the air, and are attached to the twigs and stalks of plants.

A Mantis, notwithstanding its evil habits, or rather, perhaps, on account of them, is a charming pet, if the expression is allowable in reference to an insect, its "tricks and its manners" being most amusing. No doubt, to be seen in perfection, it must be kept in its native country—as, indeed, is the case with all inhabitants of the warmer parts of the globe; but even here, if carefully brought over and so received in good health, and kept warm and well supplied with food, we know no animal of its size from which so much amusement can be derived.

STICK-INSECTS.

(June 22, 1889.)

WE are sorry to say that the leaf-insect lately presented to the Society by Lord Walsingham is dead; and this fact is the more to be regretted as during the present week a considerable number of stick-insects have hatched out in the insect-house. Had it survived, it would have been interesting to see side by side living specimens of these very nearly allied, though to the casual observer extremely dissimilar, forms.

The leaf-insects, spectres, or walking sticks, though the number of species is not large, are widely distributed, being found not only throughout the Tropics, but extending their range into more temperate regions; for example, the eggs from which the insects now in the Zoo were hatched were brought from Canada, the species (*Diaphe-mora femorata*) to which they belong ranging throughout the North and North-West of the United States and through parts of the Dominion. Again, two species are found in the South of Europe, occurring in Italy and the South of France. As may be readily imagined, the tropical species are by far the largest, some of them

attaining to a length of nine or ten inches. The insects in the Gardens, however, will not, when full grown, be more than three or four inches in length, belonging, as they do, to one of the comparatively small species. At the present time they are most curious little creatures, bright green in colour, barely an inch in length from the tips of their out-stretched forelegs to the ends of their abdomens, and have a singularly attenuated appearance. They are kept in a glass-case, the bottom of which is filled with growing grass; on this, when first hatched, they seem to rest, and there easily escape notice. They are supplied with a small branch of hazel, on the leaves of which they feed. Many of them, however, leave the cover of the plants and wander to the top of their case, where they are very noticeable; they are able to do this, as the formation of their feet makes it easy for them to walk on smooth surfaces. Like the whole of their order — Orthoptera — these insects undergo an imperfect metamorphosis; that is to say, they are hatched from the egg in a form closely resembling that of their parents. They come into the world fully equipped with three pairs of legs, which retain their shape with but little, if any, alteration, during the creature's existence, and all of which are walking limbs, in which they differ from those of the Mantidæ, a family of raptorial insects nearly allied to the Phasmidæ, whose forelegs are adapted for seizing their prey. At all stages of their existence they

closely resemble sticks and twigs, either green and growing or brown and withered, from which fact they obtain their names of stick-insects, or walking sticks; their other name — spectre — is doubtless the result of their skeleton-like shape and slow, stealthy movement.

This is not the first time that stick-insects have been hatched in the Society's Gardens. About four years ago several specimens of one of the large Asiatic species were kept safely through all their stages and arrived at maturity, and one at least of them deposited her eggs, and we have it on the authority of the keeper of the Insectorium, who observed the insects closely while under his charge, that the process was most peculiar. The eggs, as is the case in all the family, were deposited singly; but, instead of being dropped directly on the ground on which the animal was resting, they were jerked forward over its head by an upward and forward movement of the end of the abdomen. As we have said, a considerable number of the insects have now been safely hatched, and, therefore, we have every reason to hope that some at least will grow to maturity, in which case it will be extremely interesting to watch their development, and we may further hope that one or two at least may safely deposit their eggs, from which in turn a new generation may be brought forth.

THE COCOS-NUT CRAB.

(July 13, 1889.)

AMONG the additions to the menagerie during the month of June is a Cocos-nut crab—*Birgus latro*—which was presented to the Society on the 14th of the month, and is “new to the collection.” It is officially described as from “India,” a vague, and in our opinion, unsatisfactory, description of its habitat. It can be seen in the Insect-house, where it is kept in a large glass case. It is a land-crab belonging to the same family—*Anomoura*, or irregular-tailed crabs—as the hermit-crabs, a family which forms the connecting link between the crabs and lobsters.

This species grows to a large size. The carapace has been well described as being “somewhat in the form of a reversed heart, with the apex pointing forward.” The first pair of legs are armed with strong toothed pincers, or knob-claws, the left being larger than the right; the second and third pairs terminate in single nails; while the fourth and fifth have pincers, but they are small and very weak—in fact, the fifth pair of legs may almost be described as rudimentary. Its colour is most peculiar, and was well described by a lady

we overheard at the Zoo as being exactly the tint of a pickling cabbage. Its appearance is far from prepossessing; indeed it is no exaggeration to say that it is as evil-looking and uncanny a creature as can be found in the Gardens.

Darwin, who describes these crabs as being found on coral islands, saw them in large numbers on Keeling Island, and the following are extracts from his extremely interesting account of them. He says:—"Keeling Island has no quadruped excepting the pig, and no vegetable in quantity except the cocoanut. On it the pigs, which are loaded with fat, almost entirely subsist, as likewise do the poultry and ducks. Even a huge land-crab is furnished by nature with a curious instinct and form of legs to open and feed upon this same fruit. It is very common on all parts of the dry land, and grows to a monstrous size. . . . It would at first be thought quite impossible for a crab to open a strong cocoanut covered with the husk; but Mr. Leisk, one of the two British residents, assures me he has repeatedly seen the operation effected. The crab begins by tearing the husk, fibre by fibre, and always from that end under which the eyeholes are situated. When this is completed the crab commences hammering with its heavy claws on one of those eyeholes till an opening is made; then, turning round its body, by the aid of its posterior pair of narrow pincers it extracts the white albuminous substance. I think this is as curious a case of instinct as I ever heard

of, and likewise of adaptation in structure between two objects apparently so remote from each other in the scheme of nature as a crab and a cocoanut-tree." He further tells us that these crabs visit the sea every night, no doubt for the purpose of moistening their branchiæ; that the young are hatched and live for some time on the coast; and that they "inhabit deep burrows, which they excavate beneath the roots of the cocoanut trees, and here they accumulate surprising quantities of the picked fibres of the cocoanut-husk, on which they rest as on a bed. The Malays sometimes take advantage of their labour by collecting the coarse fibrous substance and using it as junk."

These crabs are alleged by the natives to climb cocoanut-trees in the night to get the cocoanuts—a story which was believed by both Linnæus and Cuvier, but of which Darwin wrote, "I very much doubt the possibility of this." However, Cuming, who found them "sufficiently abundant" in Lord Hood's Island in the Pacific, stated that they climbed *Pandanus odoratissimus*—the Screw-pine—for the purpose of feeding on the small nuts that grow on it, and that he had seen them in the trees; and, no doubt, some species of *Anomoura* are great climbers. However this may be, there is little doubt that the only cocoanuts they eat are those which have fallen to the ground. Cuming also tells us that "when he met them in his road they set themselves up in a threatening attitude, and then retreated backwards, making, both at

first and afterwards, a great snapping with their pincers." These crabs are said to be excellent eating when properly prepared, and under the tail of the larger ones there is a great mass of fat which, when melted, sometimes yields as much as a quart of limpid oil.

The specimen now in the Zoo is, as we have said, kept in a large glass case, the bottom of which is covered for a considerable thickness with moist sandy gravel, in which it delights to burrow, making as deep a hole as possible to rest in. It is fed on bananas, four or five of which are given to it every evening, and all of which, as the keeper informs us, have invariably disappeared by the morning. It appears to attract but little attention from the general visitors to the Insect-house, but few of whom are apparently aware that it is not only new to the collection, but also a rare and very interesting animal.

TARANTULAS.

(Aug. 2, 1890.)

IN June last we remarked parenthetically, in our notice of the praying mantis, that a tarantula had been received by the Society, and was then in the Insect House. This animal, however, was very short-lived, dying within a few days of its arrival. We are, therefore, glad to say that the loss has been much more than repaired by the arrival in Regent's Park of not less than five of these gigantic spiders, which, though all known as tarantulas, belong to two different families, Mygalidæ and Lycosidæ. There is a solitary specimen of the former, and four specimens of the latter. They are respectively labelled as "Brazilian Tarantula, *Mygale* sp. ?, Brazil," and "Deserta Tarantula, *Lycosa nigra*, Deserta Grande, Madiera." The first of these was purchased by and the others presented to the Society, the last, at least, being, we believe, "new to the collection."

The Mygalidæ have a considerable range; but the larger of them, which are truly gigantic spiders, are found only in warmer parts of the world—tropical America and the West Indies

being specially favoured by them. Among the smaller species which are found in Europe are the well-known trapdoor spiders, specimens of which are generally living in the Zoo, but, owing to their burrowing and nocturnal habits, can rarely, if ever, be seen; and also one species found in England, principally in the South, which constructs a curious dwelling consisting of a silk-lined tube or gallery, which takes at first a horizontal and then a vertical direction, the mouth being covered by a curtain formed of a continuation of the silken lining. At present, however, we are only concerned with the large American species. These, as a rule, do not burrow, but live in crevices in the bark of trees, and in hollows among rocks and stones, where they make a sort of silken case as a home. They are generally nocturnal in their habits, pursuing their prey in the evening and during the night, and appear to be by no means particular what they attack, though, no doubt, insects and other arthropods form the bulk of their food. According to the older authors, however, they are much given to destroying and feeding on birds, whence their name of bird-catching spiders, and the specific name of *Avicularia* given by Linnæus to one species. Mme. Merian figured and described one of these spiders, which she declared was in the habit of surprising small birds on their nests and sucking their blood with avidity.

Mr. Bates, in his "Naturalist on the River

Amazons," tells us that, though he found the circumstance to be quite a novelty to the residents on the banks of the Pará River, he was able to "verify a fact relating to the habits of a large hairy spider of the genus *Mygale*, in a manner worth recording." The following is his account of what he saw: "The spider was *M. avicularia*, or one very closely allied to it; the individual was nearly two inches in length of body, but the legs expanded seven inches, and the entire body and legs were covered with coarse grey and reddish hairs. I was attracted by a movement of the monster on a tree-trunk; it was close beneath a deep crevice in the tree, across which was stretched a dense white web. The lower part of the web was broken, and two small birds—finches—were entangled in the pieces; they were about the size of the English siskin, and I judged the two to be male and female. One of them was quite dead; the other lay under the body of the spider not quite dead, and was smeared with the filthy liquor or saliva exuded by the monster. I drove away the spider, and took the birds; but the second one soon died." This author also gives the following particulars of these spiders, which he describes as "quite common:" "Some species make their cells under stones, others form artistical tunnels in the earth, and some build their dens in the thatch of houses. The natives call them *Aranhas Caranguejeiras*, or crab-spiders. The hairs with which they are clothed come off when

touched, and cause a peculiar and almost maddening irritation. The first specimen that I killed and prepared was handled incautiously, and I suffered terribly for three days afterwards. I think this is not owing to any poisonous quality residing in the hairs, but to their being short and hard, and thus getting into the creases of the skin." After this description it is curious to find that the Indian children make pets of these creatures. Yet Mr. Bates relates that one day he saw some Indian children "with one of these monsters secured by a cord round its waist, by which they were leading it about the house as they would a dog."

In confinement these tarantulas are fed principally on cockroaches and meal-worms. The specimen now in the Zoo is a large and sufficiently terrible-looking spider, though it is, we believe, by no means full grown. It is of a deep glossy black, with the exception of its abdomen, the longer hairs on which are a rich orange red; it keeps itself concealed during the day, for which purpose it is supplied with two small flower-pots and a quantity of moss, but if disturbed, it shows considerable activity and every desire to attack the intruder on its privacy.

Like the *Mygalidæ*, the *Lycosidæ* or wolf-spiders, to which family the *Deserta tarantula* belongs, have a very wide range, and the different species vary much in size, though none of them are so large as the larger members of the former family. Still many of them, especially those inhabiting the

warmer parts of the world, attain a very considerable size, as indeed may be seen by anyone visiting the Zoo at the present time. They differ from the Mygalidæ, however, not only in size but also in general appearance; as, for example—a point which will strike the least observant—they are by comparison hairless and, indeed, generally more spider-like, though, be it observed, they are by no means destitute of hair. They are wandering, preying spiders capable of running with considerable swiftness, and, like the Mygalidæ, many of them are nocturnal in their habits, wandering about after dark in pursuit of the insects on which they feed. They live in holes, under stones, and in crevices in rocks or walls, and some species are fond of the water, on which they run in pursuit of insects.

The most famous of all the wolf-spiders is the tarantula of Southern Europe, *Lycosa tarantula*, about which most extraordinary stories were told by the older writers, many of which still cling to every spider that can be called a tarantula, thus causing the unfortunate animals to bear a worse name than even they deserve. As a fact, the bite of the tarantula is painful, but not dangerous; yet it was fully believed to be the cause of a sort of hysterical dancing mania which appeared in an epidemic form in Italy in the fourteenth century, and spread all over the country, reaching its height in the seventeenth century, after which it gradually faded away. The following extract from

Brookes's "Natural History" gives in detail the symptoms which were supposed to result from the bite of one of these spiders: "In the summer-months, particularly in the dog-days, the tarantula creeping among the corn in the fields bites the mowers and passengers. . . . The part which is bitten is soon after discoloured with a livid black or yellowish circle, attended with an inflammation. At first the pain is scarcely felt; but a few hours after there comes on a violent sickness, difficulty of breathing, fainting, and sometimes trembling. The person who is bit after this does nothing but laugh, dance, and skip about, putting himself into the most extravagant postures; but this is not always the case, for he is sometimes seized with a dreadful melancholy. At the return of the season in which he was bit his madness begins again, and the patient always talks of the same thing; sometimes he fancies himself a shepherd, a king, or any other character that comes into his head, and he always talks in a very extravagant manner. These troublesome symptoms return for several years successively, and at length terminate in death . . . this odd distemper is cured by a remedy altogether as odd, which is musick; for this only will give them ease, and they make use of the violin in particular." The effect of the music was to make the patient dance sometimes for three or four hours, until he was "all over in a sweat, which forced out the venom which did the mischief." Dr. Hill, however, whose book was pub-

lished earlier than that of Dr. Brookes, evidently doubted the truth of the stories which were current about the effect of the tarantula's bite, as he passed over the subject with the remark, "As to the effect of the poison they convey into the wound they make, there seems yet room for much explanation about it." The *Deserta tarantulas* are, as we have said, much smaller and less hairy in appearance than the Brazilian; they are also differently coloured, being black in ground colour, spotted and striped with a light grey and white. Those now in Regent's Park have no means provided for them to hide themselves, except a small plant in the middle of each case, and can therefore nearly always be seen, each of them sitting, generally in one of the corners of the glass cases in which they are confined, apparently screwed up into the smallest possible compass—as, indeed, is the habit of most spiders when at rest. They are, however, very fond of the sun, and when it shines they spread themselves out to enjoy the warmth, and at such times are full of life and vigour, and constantly on the look-out for prey, leaping with great agility on any unfortunate insect that may come near them.

Considering the fierce and brigand nature of all tarantulas, it is, perhaps, needless to say that they are each confined in a separate case, the five cases being placed on the stand at the east end of the Insect House. It is by no means an uncommon event for a tarantula, or even tarantulas, to be exhibited at the Zoo; but the present specimens

are particularly noticeable as belonging to uncommon, and, so far as the Society's collection is concerned, new species.

Pepys mentions the musical cure for the bite of the tarantula. "One Mr. Templer, a great traveller and an ingenious man, and a person of honour he seems to be," with whom he dined at my Lord Crewe's, after telling him a wonderful story of a "serpent" and a lark, the scene of which was laid in the "waste places of Lancashire," speaking of the tarantula, informed him that "all the harvest long (about which times they are most busy) there are fiddlers go up and down the fields everywhere, in expectation of being hired by those that are stung."

LEPIDOSIRENS.

(Oct. 19, 1889.)

THE Manatee is dead, and its tank in the Reptile House is now occupied by Lepidosirens, or African mud-fish (*Lepidosiren annectens*). Thus one very old-world form has given way to another immeasurably older; for these fish are representatives of the Dipnoi—a type reaching back to the time when the Devonian rocks were in course of formation. The Dipnoi, once extremely plentiful and widely distributed, are now represented by four species only—*Lepidosiren paradoxa*, a very rare American species, an inhabitant of the river Amazon and its tributaries, of which little is known; two species of *Ceratodus* or *Barrmunda*, plentiful in the Burnett, Dawson, and Mary rivers in Queensland; and *Lepidosiren annectens*, the African species, specimens of which are now living in the Zoo. The last-named is by far the commonest and most widely distributed, being found throughout the whole of tropical Africa, in the Upper Nile, in the Central Lake region—in some parts of which, Baker tells us, it is eaten by the natives both fresh and dried—on the Zambesi, and in all the rivers of

the West Coast. Little was known of these animals until the year 1837, in which year this species was described by Professor Owen under the name *Protopterus*; while in the same year Dr. Natterer published an account of the allied American species under the name *Lepidosiren paradoxa*; after which Professor Owen, considering that both species must be referred to the same genus, adopted Dr. Natterer's generic name, and called the African species *Lepidosiren annectens*, the name still in general use and adopted by the Zoological Society. Authorities, however, are not agreed, as Dr. Günther, as we find by reference to the collection of fishes in the British Museum, is of opinion that the African form should more correctly be described as *Protopterus annectens*, and that it is generically distinct from the American *Lepidosiren*.

From the point of view of ordinary visitors to the Zoo the change from the manatee, or "mermaid," as many of them preferred to call it, to the *Lepidosiren*, is eminently uninteresting, and many are the expressions of disappointment called forth by the sight of what is apparently considered to be some species of eel in the place of the expected "mermaid." Yet though so generally treated with contempt, and passed by with a mere glance, *Lepidosiren* is a creature of more than ordinary interest. In appearance it certainly bears some faint resemblance to an eel, or better still, to an eel-pout, in that its body is somewhat eel-

shaped, but here the resemblance ends. One difference between the *Lepidosiren* and the eel must strike the least observant—namely, that the former has four limbs, occupying the places of the pectoral and ventral fins in other fishes, which, to quote Professor Owen, “are round, filiform, gradually attenuated to an undivided point, resembling tentacles or feelers rather than fins or legs,” and are the simplest form of limb known. Though they have no other very noticeable outward peculiarities, the *Lepidosirens* are very remarkable creatures, approximating to the amphibia, and possessing in reality far more peculiarities than it is possible even to mention in an article of this description. A few, however, of the most important must be given. The respiratory organs consist not only of gills, but also of lungs, or rather lung-like sacs; the skeleton is very peculiar, being partly cartilaginous and partly bony, the bony part being green, as in the common gar-fish; the dentition is also very peculiar, the jaws being armed with two conical and slightly recurved teeth and with strong dental plates on both the upper and lower sides of the mouth; and, lastly, the nostrils, of which there are two pairs, are placed within the opening of the mouth, and these nostrils by their structure determine the class to which the *Lepidosiren* belongs; for, as Professor Owen says, “in the organ of smell we have at last a character which is absolute in reference to the distinction of fishes from reptiles.

In every fish it is a short sac communicating only with the external surface ; in every reptile it is a canal with both an external and an internal opening. According to this test, the *Lepidosiren* is a fish ; by its nose it is known not to be a reptile ; in other words it may be said that the *Lepidosiren* is proved to be a fish not by its gills, not by its air bladders, not by its spinal intestine, not by its unossified skeleton, not by its generative apparatus, nor its extremities, nor its skin, nor its eyes, nor its ears, but simply by its nose ; so that at the close of our analysis we arrive at this very unexpected result, that a reptile is not characterised by its lungs nor a fish by its gills, but that the only unexceptionable distinction is afforded by the organ of smell."

Though *Lepidosirens* are without doubt fishes, they spend a considerable part of their existence out of the water, as they inhabit shallow waters which periodically dry up. During the dry season they enclose themselves in balls of clay, which are lined with mucus, and have small holes at either end to admit the air. In these they remain torpid until the rains refill their pools, when they emerge and resume their existence in the water. The balls of hardened clay enclosing the fishes in a torpid condition are sometimes brought to this country, and specimens of them may be seen in the British Museum. These fishes are said never to leave the water voluntarily ; but from time to time they rise to the surface to fill their lungs with

a fresh supply of air, a habit which cannot escape the notice of anyone watching those in the Reptile House. The Australian *Ceratodus*, on the contrary, is believed to go out among the reeds and rushes on the flats which are left uncovered by the tide. *Lepidosirens* attain a length of from three to six feet; they are carnivorous, feeding on frogs, fishes, and other aquatic animals. The specimens in the Zoo, however, are small, averaging about a foot in length, and are fed on small fishes.

CHAMELEONS.

(Aug. 30, 1890.)

THE chameleon is one of nature's strangest productions; it belongs to the great order of lizards, an order which is divided into a large number of families, and comprises many hundreds of species which exhibit a great variety of form and structure, none of them, however, showing such a degree of specialisation as the chameleon. Its curious uncanny appearance, to say nothing of its power of changing colour—which, be it observed, is not, as is generally supposed, peculiar to itself, but is possessed, though not in so marked a degree, by other species of lizards—have made it an object of interest and wonder to mankind from the earliest times, and all sorts of fabulous stories have been told of it, some of them having a foundation in fact, but the majority, as is usual in such cases, being nothing but the purest invention. The chameleons have by no means a large range, the greater number of species being natives of Africa and Madagascar—the latter country alone possessing more than twenty species—though one or two are found in Asia Minor, India, and Ceylon.

Among the many amusing and interesting accounts of these animals which are to be found scattered up and down the literature of natural history, certainly neither the least amusing nor interesting is "The Anatomical Description of a Camelion," to be found in certain "Memoirs for a Natural History of Animals," containing the anatomical description of several creatures dissected by the Royal Academy of sciences at Paris, done into English by a fellow of the R.S., and published by order of the Council of the Royal Society in 1701. A work which, though probably little known, appears to have held its own for many years as the great authority on the subject with which it treats, as we find Dr. Brookes, in 1763 boldly plagiarising it. The writer had evidently carefully observed a chameleon, which he tells us was an "Ægyptian one, which is the greatest of all," both in life and by dissection after death, the result of his observations being that he wrote an extremely interesting treatise containing much excellent matter. Many of his remarks and deductions, however, are very quaint, and of these alone, rather than of his facts, we propose to treat. As a preface, he says that "there is scarce any animal more Famous than the Camelion, its admirable Properties have ever been the subject as well of Natural as Moral Philosophy. The changing of its colour, and the particular manner of feeding which is attributed to it, have in all Ages given great Admiration and Exercise

to those that do apply themselves to the Knowledge of Nature. And those Wonders which Naturalists have related of this inconsiderable Animal have made it to be the most Famous Symbole used in Rhetorick and Ethicks, to represent the base compliance of Courtiers and Flatterers, and the Vanity wherewith simple and light Minds do feed themselves. Its very name in Tertullian is the subject of a Serious Meditation upon False-glory, and he proposes it as the Example of the Impudence of Cheats and Boasters." After this diatribe our author proceeds to deal with the animal's name in the following quaint manner:—"It is not known truly why the Greeks have bestowed so fine a Name upon so vile and ugly a Beast by calling it the Little-Lyon, or Dwarf-Lyon according to Isidore's Etymology. Gesner says that it somewhat resembles the Lyon, without mentioning wherein. Panarolus would have it the Tail, which is crooked at the end, as he says, like the Lyons; But the Truth is, that neither the Camelion nor the Lyon have a crooked Tail. . . . Licetus thinks that this name was given it, because as the Lyon Hunts and devours other Animals, so the Camelion catches Flies; by the same reason that a little Worm which hunts and takes Ants, as Albertus has described, is called Formicaleon." The following is his amusing account of the animal and its habits:—"The Camelion is of the kinde of four-footed Beasts, which do lay eggs, as the

Crocodile and Lizard, which it sufficiently resembles, save that its Head and Back is not flat, like the Lizard's who has likewise much shorter leggs, with which it crawls very fast along the ground; whereas the Camelion has longer leggs, and goes easily only upon Trees, where it delights it self much more than on the ground; because, that as it is sayd it fears the serpents, from which it cannot secure it selfe by flight, and that from thence it spies them, watching the opportunity when they do pass, or sleep under him, to kill them with his Foam which he lets fall upon them." Its "foam," however, does not appear as its only weapon against "serpents"; for our author, after correctly describing the animal's teeth, which he says "to us appeared not at all serviceable to it in eating; because that it swallowed the Flyes and other insects which it caught, without chewing them," adds, "Ælian says that it defends it self against the Serpent, by the help of a great Stick which it takes in its Mouth; and its probable that its Teeth may serve to hold it fast; but it is to be understood that it holds it cross-wise, to hinder the Serpent from swallowing him up, as it usually do's Frogs and Lizards whole; For there is no possibility of explaining this place of Ælian as Gesner and Aldrovandus do, who think that the Camelion makes use of this Stick as of a Buckler or Sword wherewith it defends it self against the Serpent as a Fencer would do; for it is not nimble enough for

that.” Of its method of progression we are told —“Its pace was slower than that of a Tortoise, and seemed very Ridiculous, in that its Leggs being not short and incumbered like those of the Tortoise, but very loos and free, it carried them with a kind of gravity which seemed affected, because needless. Wherefore Tertullian saith that one would think that the Camelion rather made as if it would walk than that it really did. Some do think that this Gate is a Mark of the Timerousness, which is said to be very extream in this Animal. But because it is certain that Fear, when it is not great enough wholly to take away Motion, adds great Strength to that of the Leggs ; into which it is believed that it makes all the Heat and Vigour, which has left the Heart to descend. It is much more probable that this slowness is the effect of a great Precaution, which makes it to act circumspectly.” Of the ultimate fate of the chameleon in question we are told nothing directly ; but no doubt it fell a victim to science, as we know that “after it was dead” it was most carefully dissected, and drawings of its skeleton and viscera have been handed down to us. That no part of it was wasted we gather from the concluding sentences of the treatise, which are as follows :—“As for the Knowledge of the incredible Virtues which the Superstition of the ancients hath attributed to the Camelion and of which Pliny saith that Democritus hath writt a whole Book, they are so Extravagant in

the Judgment even of Pliny that we referr our selves to his opinion thereof. And without trying whether we could raise Tempests with its Head, or gain Law-suits with its Tongue, or stop rivers with its Tail, and do the other Miracles which it is said Democritus hath left in Writeing ; we were contented to make those experiments which seemed to have some probabilitie, being founded on Sympathie and Antipathy, such as is that which Solinus Reports to be so great between the Crow and the Camelion, that it dyes immediately after having Eaten of its Flesh. The truth is that a Crow peckt several times with its Bill on our Camelion, when it was set to it Dead ; and we gave it several Parts of it to eat, and even the Heart it self, which it swallowed without any harm.”

Chameleons of one species or another can generally be seen in the reptile house at the Zoo, it being a rare event for the Society to be without one—at the present time they have no less than eight. But they attract but little attention from visitors, and indeed are not very interesting looking animals, as they sit stolidly on the plants provided for them in their cases, generally without moving. They cannot be kept constantly supplied with insects for food, and, speaking from a somewhat intimate knowledge of the habits of these animals in confinement, there is nothing in the world will induce a chameleon to take even the slightest apparent interest in its surroundings unless it be

the sight of what it considers a toothsome insect. Nevertheless, they are by no means uninteresting animals, and when allowed to wander at large and forage for themselves in a greenhouse they are a constant source of amusement. The chameleon's method of taking its prey is very curious, being effected by shooting out an enormously long wormlike tongue, the end of which is clubbed, and covered with a viscid secretion, to which the insects stick, and are thus drawn into its mouth. The actual projection of the tongue is made with marvellous rapidity, but, before striking, the animal very slowly opens its mouth, with all the appearance of taking a most deliberate aim. Its eyes are most noticeable; they are very large, but with the exception of an extremely small opening in the centre, are covered with skin; they are also entirely independent of one another, with the result that occasionally the creature is looking forward over its nose with one eye, while with the other it is intently watching something directly behind it. And, finally, its far-famed power of changing colour—which, as we have said is also enjoyed by other lizards—is perhaps the most noticeable of the creatures many peculiarities. It is "partly dependent on the degree in which the lungs are filled with air, and different layers of chromatophores (cells in the skin in which the colouring pigment is deposited) are pressed towards the outer surface of the skin." It appears to be produced partly at the will of the animal and

partly by an “involuntary habit which enables its tints to correspond with the natural substances on which it is placed.”

Chameleons can generally be obtained in London during the summer months; but the trade appears to be a very fluctuating one, as sometimes they are scarce, and therefore expensive, while at others they may be bought in many of the “bird-shops,” their price at such times being about 2*s.* 6*d.* a-piece. They are by no means difficult to keep while the weather remains warm; but we imagine that few of them survive a winter in this country.

CROCODILES.

(Dec. 3, 1892.)

“THE river Nilus nourisheth the Crocodile; a venomous creature, foure footed, as dangerous on water as land. This beast alone, of all others that keepe the land, hath no use of a tongue; he only moveth the upper jaw or mandible, wherewith he biteth hard; and otherwise terrible he is, by reason of the course and ranke of his teeth, which close one within another, as if two combes grew together. Ordinarily he is above eighteene cubits in length. His feet be armed with claws for offence, and his skin so hard, that it will abide any injury whatsoever and not be pierced.” Thus quaintly, and with the odd mixture of fact and fable so common to all old-world writers, does Pliny, or rather his seventeenth-century translator Philemon Holland, Doctor of Physicke, describe the crocodile.

Crocodiles have always exercised a weird fascination over men, with the result that the ancient Egyptians worshipped them while living and made mummies of them when dead, and that books of natural history and travel in all ages have abounded in anecdotes and fables concerning them. Indeed, there are so many of these wonderful

stories extant that it would be easy to fill a volume with them. We only propose, however, on the present occasion, to notice two of the best known and most generally believed. That which related the method of attack supposed to be adopted by the ichneumon on his enemy the crocodile was found in grave works on natural history so late as the end of the last century, as it is set out in full in the pages of Dr. Brookes's "History of Quadrupedes," though it is only fair to that erudite author to add that he says, "We know that it must be false." Holland in his translation of Pliny's "Natural History," referred to above, gives the story as follows :—"When he [the crocodile] hath filled his belly with fishes, he lieth to sleep upon the sands in the shore : and for that he is a great and greedie devourer, somewhat of the meat sticketh evermore between his teeth, in regard whereof commeth the wren, a little bird called there Trochilos, and the king of birds in Italy: and shee for her victuals' sake, hoppeth first about his mouth, falleth to pecking or picking it with her little neb or bill, and so forward to the teeth which he cleanseth, and all to make him gap. Then getteth shee within his mouth, which he openeth the wider, by reason that he taketh so great delight in this her scraping and scouring of his teeth and chaws. Now when he is lulled as it were fast asleep with this pleasure and contentment of his : the rat of India, or Ichneumon above-said, spieth his vantage and seeing him lye thus broad gaping,

whippeth into his mouth and shooteth himselfe downe his throat as quicke as an arrow, and then gnaweth his bowels, eateth an hole through his belly, and so killeth him." Topsell, of course, relates this story, but he enlarges on and gloats over the misery of the unfortunate reptile, which he calls a serpent; for he tells us that the crocodile after the attack "tumbleth to and fro sighing and weeping, now in the depth of water, now on the land, never resting till strength of nature fayleth. For the incessant gnawing of the Ichneumon so provoketh her to seek her rest, in the unrest of every part, herbe, element, throwes, throbs, rowlings, tossings, mournings, but all in vaine, for the enemy within her breatheth through her breath, and sporteth herselfe in the consumption of those vitall parts, which wast and weare away by yeelding to impacifiable teeth, one after the other, till shee that crept in by stealth at the mouth, like a puny theefe, come out at the belly like a conqueror through a passage opened by her owne labour and industry." This last author, by the way, has a wonderful picture of a hippopotamus lifting up in his mouth a crocodile—apparently rigid with terror—by the tail, which he says "was taken out the Colossus In the Vatican at Rome representing the River Nylus, and eating of a Crocadile."

The other story which gave rise to the proverbial expression "crocodile's tears" was universally believed in old times. The author of the "*Voiage*

and Travayle of Sir John Maundeville Knight" says:—"In many places of Inde are many cocodrilles—that is, a manner of a long serpent. These serpents sley men and eate them weping, and they have no tongue." While Topsell writes, "There are not many brute beasts that can weepe, but such is the nature of the Crocodile that to get a man within his danger, he will sob, sigh, and weepe as though he were in extremetie, but suddenly he destroyeth him. Others say that the Crocodile weepeth after he hath devoured a man." Both Shakespeare and Spenser, be it observed, notice this fable; the former says:—

The mournful crocodile

With sorrow snares relenting passengers;

while the latter in his "*Faerie Queen*" relates the story in a passage much too long for quotation. With the following extract from Topsell, which is too good to be passed over, though it does not relate to either of our fables, we must leave this branch of our subject:—"Some have written that the Crocodile runneth away from a man if he winke with his left eye, and looke steadfastly uppon him with his right eye, but if this be true, it is not to be attributed to the vertue of the right eye, but onely to the rarenesse of sight which is conspicuous to the serpent from one eye."

The position of the crocodile in the animal kingdom was a terrible puzzle to naturalists of old, and has, indeed, been but very recently determined. Pliny and most of the mediæval

authorities who copied him placed it among the serpents; but Belon placed it with the fishes, and over his woodcut, which represents the animal walking along a river bank with "one foot in sea and one on shore," we find "Portrait du Crocodile, poisson du Nil," while below is the following quatrain:—

Le Nil produit des monstres perilleux,
Lors que d'Egypte arrouse le país.
Mais entre ceux, dont sommes esbahiz,
Le Crocodile est le plus merveilleux.

The naturalists of the last century, including Linnæus, classed it with the lizards, but in our modern classification the crocodiles, gavials, and alligators form an order *Crocodylia* by themselves. It is not surprising that the naturalists of the last and the early part of this century should thus have classed the crocodilians with the lizards, when we consider that they were guided by external appearances only, and paid little, if any, attention to anatomy; but anatomically there are many and great differences between the two orders, differences which in this article it is impossible even to touch on, and there is no doubt that their respective places in the animal kingdom have at last been rightly determined. Popular misconceptions die hard, and it is therefore not surprising that two errors respectable from their age should still hold their ground—namely, that the crocodilians are lizards, and that crocodile and alligator are synonymous terms—but that they do so is indis-

putable. Sir S. W. Baker, for example, who has probably as extensive an acquaintance with these reptiles in their native haunts as anyone living, cherishes both these errors, for in his very interesting book, "Wild Beasts and their Ways," he says, "We find the largest of all lizards, the crocodile, under various names, in nearly every river of the tropics. In America this reptile is generally known as an alligator, and some persons pretend to define the peculiarity which distinguishes that variety from the crocodile, but I regard the distinction in the same light as that between the leopard and the panther, the difference existing merely in a name." Yet, as we have said, the Crocodilia are not lizards, and the true crocodiles are distinct from the alligators. Among the points of distinction the following are the most noticeable. In the crocodiles the so-called canine tooth, the fourth counting from the front, fits into a notch in the side of the upper jaw, and is, therefore, visible when the mouth is closed, while in the alligator it is received in a pit in the upper jaw, and, is, therefore, invisible, or nearly so. Again, in the crocodiles the hindlegs have a fringe of flattened scales which is wanting in the alligators, whose legs are round.

Crocodiles are found in Africa, Asia, the tropical parts of Australia, Central America, and the West Indies; while the alligators, with the exception of one species discovered some few years since in China, are found only in America. They are all

of them terribly destructive creatures; the young feed principally on fish, but as they grow larger they attack every animal that they can overpower, dragging their prey into the water, and so drowning it. It has been said that more people are killed by crocodiles than by any other of the wild beasts of Africa. To those who wish to know more of this part of the subject we commend Sir S. W. Baker's book mentioned above. The Crocodilia, are, as every one is aware, thoroughly aquatic in their habits, and their peculiar conformation enables them to attack and seize their prey unawares. Their nostrils, which lead by a long canal to the back part of their throats, their eyes and their ears, are placed on the upper part of the head, so that when in the water they can breathe, see, and hear while they are themselves practically invisible. When they dive their nostrils and ears are closed by lids or valves, and their eyes are covered by a transparent nictitating membrane. They are further furnished with an arrangement which prevents the water from getting down their own throats when they are holding large animals under the water to drown them. The dentition of these reptiles is peculiar; the teeth are sharp and conical, and are hollow at the base, and each tooth serves as the sheath of another, which will in time replace it. The tongue—for, notwithstanding the ancient belief, the crocodile does possess a tongue—is fleshy, and is attached to the bottom of the mouth. And finally the lower jaw is hinged at the

very back of the skull, thus giving the animal its extraordinary gape, and also the peculiar appearance which caused the notion that it moved its upper jaw.

Though in the foregoing remarks we have barely touched the fringe of crocodile lore, space will not permit us to do more than draw attention to the fact that at the present time the reptile house at the Zoo is more than usually well furnished with crocodiles and alligators, ranging in size from mere babies of a few inches in length to the well-known Mississippi alligator, which has lived in the gardens for more than eight years, and is now about 11 feet long, and has by no means done growing. The collection includes at least one specimen of the hill crocodile, and two of the recently discovered Chinese alligators. In conclusion, we may observe that these animals are not always the quiet, voiceless creatures that they generally seem to be, but that on occasion they can and do hold an extremely noisy, roaring concert.

II.—BIRDS IN LONDON.

THE SPARROW.

(Oct. 8, 1887.)

THERE is a popular theory, which, like many another, is founded on error, that the sparrow is the only *wild* bird to be found in London; and this belief, curiously enough, is held not only by Londoners, who, were they really possessed of eyes to see, should know better, but also by most people who live in the country. There is perhaps more excuse for this than for many other popular fallacies, owing to the ubiquity and self-assertiveness of the bird in question. Wherever the sparrow is found—and it is now largely distributed not only over the Old World but the New—it is, as one of our greatest ornithologists has said, a parasite of man; in fact, without man it cannot live and thrive. It will, no doubt, in default of better accommodation build its nest in a tree, but that tree must be near a human habitation, though to the sparrow it is a matter

of utter indifference whether the habitation in question be a palace or a hovel. When, however, it has the chance it infinitely prefers some nook or corner of a house or out-building where it can insure what to it are in reality necessities rather than luxuries of life—warmth and human companionship.

Admitting these facts, there is surely no cause for wonder that London is the sparrow's paradise. And again, admitting the self-assertiveness of the bird—and Bewick, by-the-bye, stated, quoting, as he says, Buffon, that "its familiarity and petulance are disgusting"—it is not surprising that Londoners, or the great majority of them, have decided that it is their only wild bird, and that the rest of the world has agreed to accept their dictum as absolutely true.

As we have before stated this is an entire misconception, as not only have very many birds of different species their habitation in London, but many, nay, most, of the migrants pay it literally a flying visit. In the densely-populated parts of the city and central London the sparrow carries matters with a high hand, as it has practically no rival. Here, indeed, we meet the true "London sparrow," a distinct species of sparrow as some apparently imagine, but in truth no other than *Passer domesticus*, suffering from moral and physical deterioration, the result of life in a great city.

The true "London sparrow" resembles in its

habits no being so much as the street boy. They are both the result and outcome of life in a crowded city, and have practically the same vices and foibles. Watch them in a busy street; they are thievish, self-assertive, and pugnacious. The sparrow is also the impersonation of vanity; for, notwithstanding that, like the street boy's, its coat is always dirty and very much out-at-elbows, and that its general appearance conveys the idea that it sleeps in a chimney, and that a very crowded one, it evidently considers itself the pink of perfection, and we have no doubt looks down on its country cousin in his neat suit of brown, black, and grey as being badly dressed and generally a very inferior person.

To thoroughly appreciate the vanity of the sparrow the cock bird must be seen on a sunny morning in early spring when engaged in displaying his charms to the lady of his love; then, indeed, is he in all his glory. How he struts and swells, and spreads his tail, often nothing finer than a few stunted feathers! No peacock, we are convinced, has a higher opinion of himself, or thinks himself a finer fowl. The London sparrow is generally spoken of as a wild bird, though in reality a tamer and more homely bird does not exist on the face of the earth; indeed, were it wild, in the strict sense of the term, its existence, in the crowded streets of London at least, would be a short, but certainly not a merry, one. As we have before remarked, the

sparrow cannot live unless it is associated with man, but nevertheless the country sparrow is wild indeed in comparison with his London cousin, who would, we are convinced, were he but a few sizes larger than he is have the impudence to dispute the pavement with all passers-by.

If any of our readers desire to test the tameness and familiarity of the "London sparrow," we advise them to provide themselves with a pocketful of crumbs, and go to some open space—say, for example, Palace Yard, Westminster, a place where sparrows largely congregate, and scatter them on the ground. We doubt if they will not be astonished, not only at the number of sparrows that will in a very few moments assemble round them, but also at the excessive tameness of the birds; they have literally no fear of man; to them he is not an enemy, but a benefactor; they look to him for food, and have evidently no notion that he could wish to do them harm, not having—like their relations in the country—any experience of guns, batwing nets, and other devices for their destruction.

As a fact, no being—a boy or a cat always excepted—has the least desire to injure a "London sparrow," and our observation leads us to believe that both these enemies are treated with well-merited contempt, their power of mischief being for obvious reasons excessively limited, as the London boy, though thoroughly possessed with

the hunting instinct said to be inherent in human nature, finds his ardour always damped and his aim impaired by the fear that, should he start on a sporting expedition, he in turn may find himself the object of pursuit by his natural enemy the policeman; and the cat finds the tiles and parapets of London houses badly arranged for stalking purposes, and, with the exception of an hour or two in the very early morning, the streets, the "London sparrows'" happy feeding-grounds, are absolutely impassable to him.

Most open spaces in London are provided with a cab-rank, and there the sparrows receive from the cabmen their daily rations, and show no more fear of man than do the pigeons with whom in such places they always associate. Hitherto we have spoken of the true London sparrow, the bird whose home is in the crowded streets, and whose life is spent among bricks and mortar, who knows no more of trees and fields and growing corn than does his congener the street boy. There is, however, another sparrow, of the same species be it always understood, that inhabits the suburbs and parks of London, whose coat, though not so clean and bright as that of its country cousin, is passable, and generally whole and unruffled, and looks as if the wearer took some little pride in its condition. Circumstances are no doubt in this bird's favour, as, in lieu of smutty roofs it has trees on which to perch, and can always find

a spot suitable for a good dust bath, the sparrow's greatest luxury. This is, however, a "London sparrow," though not so tame, and therefore not so impudent, as its city brother. In fact, while having little fear of man, there is more of the true wild bird about it, due, no doubt, to its surroundings and to the fact that it is not so directly dependent on man for food. It can, if so minded, obtain a change of diet; and, while not believing in the sparrow as an insect-eater, and therefore a benefactor to man, as some of its more ardent friends and admirers would have us believe, we must admit as a well-known fact that it does, when they are obtainable, eat, and no doubt enjoy, a few insects. Who, indeed, has not seen it on a hot summer day fluttering ludicrously in the air in an apparently frantic endeavour to emulate the fly-catcher.

Another advantage that the suburban sparrow has over its brother of the city is that, towards the end of summer it can, and often does, remove into the country with its family, there to live on the fat of the land until, the harvest being gathered and the nights becoming long and cold, it, like the human Londoner, returns with its belongings to town, invigorated no doubt by change of air and scene. So far we have spoken only of the sparrow's bad qualities. One good quality, however, cannot be denied it—that is, love of its family. In this it is pre-eminent among birds. Many species will, no doubt, by

devices, such as pretending to be wounded, endeavour to draw a supposed enemy from their nest; but the sparrow stands alone as the bird that will, as has been proved without possibility of doubt, continue for months to feed one of its young that, being unfortunately entangled in the nest, has been unable to fly with the rest of the brood.

Its nesting in London is an unmitigated nuisance. No place is sacred to it. Wherever a convenient hole can be found, there it collects the heap of rubbish, always lined with feathers if they are available, which it pleases to term a nest; and not infrequently the hole in question is the top of a water-pipe, the result being that the first heavy shower not only destroys the bird's prospects of a family, but also leads to material damage to the property and temper of its human landlord. If abused for the destruction and discomfort it causes it might, were it possessed of the power of speech, and therefore able to enter into an argument, retaliate, and say "Why not do as your forefathers did?" for Rennie, who edited Montague's "*Ornithological Dictionary*," tells us that in his time "he was not aware that any contrivance was resorted to in Britain to entice birds to build in particular places, except in the case of house sparrows;" and then proceeds: "*That in the vicinity of London more particularly pots of unglazed delf-ware of suboval shape, with a narrow*

hole for an entrance, were fixed upon the walls of houses several feet below the eaves;" and adds that "the sparrows delight in, and immediately take possession of, these as nesting-places."

This fashion having, in London at least, so far as we are aware, died a natural death, the sparrow can hardly be blamed for taking possession of what appear to it equally suitable building sites. No account of the sparrow, whether of town or country, would be complete unless mention were made of its pugnacity. It delights in a row, whether the object relates to its own affairs or those of its neighbours. All who are in the habit of observing birds, and many who do not make them their study, must again and again have seen a group, or, perhaps a better description, a bundle, of sparrows screaming, pecking at, and falling over, one another, apparently possessed by most insensate rage. The cause of the excitement is as likely as not an altercation between two birds as to the possession of a piece of rubbish which both desire for nesting purposes. A battle begins between the interested parties, and immediately all the sparrows in the neighbourhood, though they know nothing of the bone of contention, think it is their duty, like the seconds in the duels of old times, to join in the fray. The combats are, however, generally of short duration, as, after one or two good rounds, the birds' fighting ardour is apparently satisfied,

and they, with one accord, separate, and return to attend to their own affairs.

In conclusion, however, we must say that, impudent, mischievous, dirty, vain, and pugnacious as he is, we would not for any consideration part with the "London sparrow."

THE ROOK.

(Dec. 3, 1887.)

AMONG the many species of birds that live, or rather nest, in London, the rook is by no means the least common, though it is year by year becoming scarcer, and will, we fear, be extinct as a London bird within a measurable period. The two main causes of the diminution of its numbers are, firstly, that the speculative builder is rapidly destroying the fine old trees, once so common in London and its suburbs, in which the bird loves to build; and, secondly, the unfortunate propensity of old trees, especially elms, when exposed to the smoke-polluted atmosphere of London, to decay at the top. It is well-known that a nesting rook has as much objection to an unsound tree as the rat of the proverb is said to have to a sinking ship. If rooks, having nested for years in any particular tree, leave it without being disturbed, that tree may, without examination, be declared unsound.

It is curious that the rook should, among Londoners, be so intimately connected as it is with the country; for, in truth, there are few birds that more readily adapt themselves to life in a

populous city. In fact, if they can find suitable nest-trees, where they are free from disturbance, and feeding-grounds within a reasonable distance, crowds, the roar of traffic, and even London smoke, are utterly ignored by them. A better instance of this cannot be adduced than the fact that rooks still build in considerable numbers so near the centre of London as the gardens in Gray's-inn, though these gardens are situated in the midst of a densely populated and most busy neighbourhood, and the traffic in the surrounding streets is as heavy as any in London.

The builder is, without doubt, the London rook's greatest enemy, as not only has he, within the last half-century, destroyed several rookeries within the four-mile radius, but by continually covering with buildings their former feeding-grounds, and therefore increasing the labour of providing food for their young, he is making life in London more difficult for those birds whose nesting-places are, at all events for the present, beyond his reach. The builder, however, is not wholly to blame, as the decay of the trees was, so far as we are aware, the sole cause of the rooks deserting their ancient nesting-places in Kensington Gardens, where certainly within the last quarter of a century there were three large rookeries.

Some people imagine that this desertion was caused by the increased traffic through the Gardens, and by the large number of buildings that sprang

up around them; but we are not prepared to admit this in view of the rookery in Gray's Inn, and of the fact that some of the birds when they left Kensington Gardens joined the old rookery in Holland Park, many of them settling in the trees skirting the high road. Had their objection to traffic and buildings driven them from their old haunts, they would surely have gone further afield, and have chosen some quieter spot. The truth, however, is that rooks have a strong affection for what Gilbert White called "neighbourhoods," though, unlike the sparrows and pigeons, they cannot from the nature of their food, which consists principally of worms and insects, obtain their living in the streets, but are obliged to seek it far from their homes.

Rooks can hardly be said to have any permanent habitation, though year by year they nest in the same trees; for no sooner are their young able to fly and provide for themselves than they leave their nest-trees, and, forming large companies, choose some woodland as a roosting-place.

London rooks are not exempt from this habit; in fact, they leave town with as great regularity and about the same time as do their fashionable human friends. In October, about the time known as "St. Luke's Summer," they return to their nest-trees, apparently to see that their homes are in order, and at this time they may be seen busily carrying sticks, and evidently engaged in making repairs necessary to ensure the safety of their

nest during the coming winter. This business having been satisfactorily accomplished, they again leave, and remain out of town until the end of January or early in February, when they return to their homes, and begin at once to prepare for family cares.

Rooks, whether of town or country, live in large communities, and their form of government is, so far as we can understand it, republican; but in their case, as happens in more highly organised communities, a democratic government does not lead to absolute freedom of the subject. Let anyone who doubts this watch the inhabitants of a rookery in early spring, and we shall be surprised if he does not see at least one pair, probably young and inexperienced birds, endeavouring to build a nest in a position, generally a short distance from the main rookery, evidently disapproved of by the governing body. So far as the human observer's understanding can carry him, the offending pair are within their right in making their choice of a home, but this is evidently not the opinion of the powers that be, and the nest is destroyed again and again, if need be, until, apparently driven to despair, the wretched couple accept the inevitable, and make their home, not in the place of their choice, but in a position allotted to them by the ruling body. When first they return to their nest-trees in the spring, rooks are most noisy birds. According to Gilbert White, at this season "they attempt sometimes in the gaiety of their

hearts to sing," but, he adds, and we think that no one who has lived within earshot of a rookery will disagree with him, "with no great success,"

While they are building and repairing their nests they are most pugnacious and thievish, as not only will they, as we have said, prevent a pair building in what may seem to the majority an unsuitable site, but they are constantly endeavouring to rob one another of their nesting materials, and woe betide the unwary pair that are rash enough to be absent from their nest at the same time; on their return they will, in all probability, find the labour of days destroyed, and nothing but the poorest foundation left of what was on their departure, probably a very short half hour before, a promising structure. Our observation leads us to believe that only the very young and inexperienced birds leave their homes in company. As a rule one bird remains on guard while its mate goes afield, and the unfortunate stay-at-home often has to fight against long odds in defence of its nest, which would, were it not stoutly defended, be torn from under it. Occasionally an enterprising pair will separate themselves from their companions and build sufficiently far from the nearest rookery to be free from molestation, though after their nest is built they in many cases, apparently finding solitude not so pleasant as they anticipated, desert it and return, no doubt in a penitent mood, to their former friends.

An instance of this occurred in Kensington in 1885, when a pair of birds, no doubt from the rookery in Holland Park, built their nest in a tall plane-tree not far from the parish church; but no sooner was it complete than they deserted it. All, however, are not so vacillating, and often they continue to rear their young from year to year far from any of their kind.

Many cases are on record of these birds making choice of such unusual positions for their nests as the vanes on the spires of churches or public buildings. One well-known instance which occurred in London may be cited—we refer to the case of the birds which early in the century built between the wings of the dragon forming the vane of Bow Church. They were dispossessed when the vane was repaired, but removed to a plane-tree at the corner of Wood-street, Cheapside, where they continued to nest for many years, and became one of the sights of London, or at least of the City.

It would be impossible within the limits of this article to give even an outline of the history of the rookeries of London, as during the early years of the century London was comparatively a small city, and abounded in trees, and consequently rooks were as common as they are now in most of our provincial towns. When London began to spread, as it did with marvellous rapidity about the middle of the century, the rook, finding its home destroyed, gradually withdrew to the

suburbs, from which, as we have said, it is slowly but surely being driven.

In conclusion, the rook, by still nesting in London wherever it is permitted, has most conclusively proved the falsity of the theory generally held in the country, that, if many of the young birds are not shot as soon as they are able to fly, the rook will desert its nesting-place.

THE STARLING.

(Jan. 21, 1888.)

THE starling is, with the exception of the sparrow, probably the commonest of London birds. From the nature of its food it is not so ubiquitous, but in all the Parks and larger open grassed spaces it may be seen at all times of the year. Its food consists principally of worms and insects; but, notwithstanding that it possesses an enormous appetite, it can live and thrive where the rook, who feeds like it, would starve, the difference in size, and therefore in the amount of food required, having doubtless much to do with this. The number of starlings, in the Parks at least, does not appear to be diminishing, the decay of the trees, which has driven the rooks from their former haunts, having made life easier for these birds by providing them with excellent nesting places, a hole in a tree being considered by the starling a most comfortable nursery. Kensington Gardens, which unfortunately contains as many decaying trees as any park of its size in England, is in consequence largely frequented by these birds during the breeding season, as they find not only comfortable homes and plenty of food within a reason-

able distance, but also immunity from disturbance, as since the park-keepers have been replaced by the metropolitan police, even the most adventurous boys have given up any idea of bird's-nesting there. However, it does not by any means confine itself to nesting in trees, as it thoroughly appreciates an unused chimney, and will take possession of any suitable hole or cranny in a house or other building. In the case more especially of buildings thickly covered with ivy, of which we are sorry to say few are to be found in London, it builds its nest and rears its young in close company with the house-sparrow, with which it appears to live on the best of terms, thus, we think, disproving one of the many charges that have been brought against it—to wit, that it, like the daw, is occasionally given to making a meal of the young of its smaller and more feeble companions.

During the breeding season, more particularly, the starling is a noisy, merry bird, spending the whole of its spare moments in whistling, singing, and chattering, as if endeavouring to explain to the whole world how thoroughly it enjoys its life. It is also one of the busiest of birds, constantly running over the grass in pursuit of its food with a manner and gait that is best described by the word "fussy." While it is so engaged no living thing appears to be too small to escape its notice; it is not, however, content with the insects to be found on the surface, but is constantly stabbing and probing the ground with its bill in search of

worms and larvæ. It is, in fact, a true friend to the gardener, though we can but admit that the charge brought against it of robbing cherry and other fruit trees has considerable foundation in fact, and that it will also, though this is probably not so heinous an offence in the eyes of the suburban gardener, help itself freely to grapes grown out of doors. Wherever sheep are kept, it is fond of perching on their backs, the cause of this habit being, no doubt, that it is enabled to vary its diet by making a meal of the ticks and other parasites to be found in the wool.

The starling is one of the most beautiful of British birds, though there are many that are more brilliantly coloured. The cock bird in his summer dress, with his bright yellow bill, and his spotted plumage shot with metallic colours, is, in our opinion, surpassed by very few. Even the smoke and dirt of London cannot destroy his beauty; and, unlike the sparrow, wherever he is found he looks and carries himself like a gentleman. This bird, indeed, deserves to be a much greater favourite than it is. Its beauty, and its merry chattering ways, to say nothing of its usefulness in destroying enormous numbers of insects and their larvæ, entitle it to respect and protection wherever it is found, even though it does make the gardener pay toll of his fruit. In addition to its other attractive qualities, it has a certain fearlessness of man, quite distinct from the aggressive impudence of the sparrow, a fearlessness apparently

the outcome of a clear conscience, the very movements of the bird when searching for its food on a lawn conveying the idea that it knows it is engaged in a good work, and will therefore not be molested.

When the ground is covered with snow, starlings, especially in the suburbs, are generally found among the birds coming with great regularity to be fed by those bird-lovers who clear a space and throw down crumbs and scraps to help their feathered friends through what to them is a most trying time.

Though, as we have said, starlings are to be found in London and its suburbs at all times of the year, the main body leave town as soon as their young are strong on the wing—that is, towards the end of summer. Being birds with great power of flight, they are very wide rangers, and many of them, there is little doubt, leave this country during the winter; a yet larger number, however, migrate to the westward. Those that remain in this country form large flocks, which are during the day often to be seen in company with rooks, daws, and even lapwings. These flocks collect at night to roost, often forming huge bodies, the birds being literally in thousands. Yarrell gives an account of one of these “starling roosts” which existed in his time at King’s Weston, near Bristol, “in a plantation of arbutus, laurustinus, &c.,” to which he tells us, the birds “repaired in an evening by millions from the low grounds about

the Severn, their noise and stench being something altogether unusual."

Young starlings, until after their first moult, are in colour utterly unlike their parents, their plumage being of a dull brown. So unlike, in fact, are they that such good observers as Montagu and Bewick described and figured young starlings as specimens of the "solitary thrush," though how the mistake could have arisen it is hard to conceive, as we should imagine that any boy who had ever had an opportunity of bird's-nesting could have identified the species. During the time they remain in the nest the young birds are most voracious, nothing apparently coming amiss to them, and this voracity often leads to their destruction, or at least captivity, as they are so wanting in discrimination that even the human finger is readily seized under the mistaken idea that it can be swallowed and is good for food. The wily boy, knowing this, is often enabled to capture fledglings, whose nursery is far from his reach in the depths of a hollow tree. The proceeding is a simple one; he waits until he knows that the birds are nearly fledged, and therefore strong and fit for his purpose, when inserting his arm into the hole in which the nest is built, and spreading his fingers, he, as a rule, finds at least one of them seized, and is able, before the deluded bird has time to discover its mistake, to drag out his struggling victim. Starlings when taken from the nest are not difficult birds to rear, and if

trouble is taken with their education, can be taught to articulate words, and even very short sentences, though they much more readily imitate other birds, or animals, than the human voice. This bird is, indeed, a mocking-bird, and may often be heard to mix the notes of other birds with its own peculiar song. From its wide-ranging habits it associates with all sorts of apparently incongruous companions, and may occasionally be heard to imitate exactly the wild cry of the redshank or other wader, the result, doubtless, of a visit, during the winter, to the banks of one of our tidal rivers, as it is a very common habit of this bird, especially in severe weather, to visit the banks left bare by the tide, as by so doing it can always ensure a meal.

Starlings are certainly on the increase in the country, and, as we have said, their numbers do not, in our opinion, materially decrease in London, or at least in the suburbs; nor do we think that, so long as the Parks at least remain, there is any cause to fear that they will cease to be reckoned among the birds of London.

THE WOOD-PIGEON.

(Feb. 25, 1888.)

PROBABLY the last bird that a countryman would expect to find in London would be the ring-dove, or, as it is more commonly called, the wood-pigeon; yet this bird, though not by any means common, is generally to be seen in the Parks, and can certainly claim to be included in any list of London birds, as it is found so near the centre, if not of London proper, at least of the cab radius as St. James's Park, and may occasionally be seen under the shadow of the Clock Tower at Westminster, in the trees near the Sessions House, and is not unknown in Whitehall.

It is certainly curious that a bird naturally so wild and wary as the wood-pigeon should so alter its habit as to live the year through in parks even as large as those of the West End, surrounded as they are by miles of streets and buildings. Those birds, however, that have chosen London as their dwelling-place, while in no way comparable in tameness to the dovecote pigeons which congregate in such large numbers about many of our public buildings, are, no doubt from long immunity from disturbance, so free from fear of man that they

may occasionally be seen quietly feeding on the grass plots in St. James's Park, surrounded as they always are by crowds of pedestrians. Kensington Gardens are always frequented by a few of these birds, and they breed there from year to year. We have also every reason to believe that they build in the gardens of Buckingham Palace.

It is surprising that these birds are not better known to the average Londoner than they appear to be. Their size—they are the largest of our wild pigeons—their peculiar flight, and their distinctive markings—the most noticeable of these being the white feathers on each side of the neck, from which they derive the name of "Ringdove," and by which alone they may be at once distinguished from any dovecote pigeon—should, one would suppose, attract the attention of the least observant. Their note, again—coo, coo-coo, roo, roo, the last two syllables long drawn out—once heard, can never be mistaken, being entirely different from that of any other pigeon. There are many word versions of this note, but we think it is best expressed by one we have heard in the Eastern Counties, to wit, "My toe bleeds Betty."

The wood-pigeon is not only the largest, but in our opinion the handsomest, of our wild pigeons. The London bird, however, from his habit of, after the manner of his kind, perching in and roosting on trees, is always soot-begrimed and dirty, but notwithstanding is still a handsome and noticeable

bird. Wood-pigeons begin to breed early in the spring, and have, as a rule, two, if not three, broods in the year. During the breeding season the cock bird, possessed doubtless with a desire to show himself off to his mate, constantly takes short flights in which he rises and falls alternately, occasionally clapping his wings over his back. This flight is so peculiar that it alone should, one would suppose, attract the attention of the least observant. The nest is but a poor structure, being, indeed, nothing more than a meagre platform of sticks, placed one over the other, on which the two white eggs are laid. Such a miserable structure, indeed, is it that few interested in birds who have lived where wood-pigeons breed in large numbers can have failed to notice nests through which the eggs could be seen from below. This nest has evidently been a source of wonder for generations, and many are the legends told to account for it. All, so far as we are aware, are based on the same idea—namely, that the pigeon, unable to build a nest itself, and considering the magpie's a beautiful specimen of bird architecture, an opinion which few will dispute, asked it for lessons in nest-building. The best of these legends, perhaps, is that given by Montagu as current in his time in Suffolk, and this is specially interesting as it contains another word version of the wood-pigeon's note, it is as follows:—"Instead of being a docile pupil, the pigeon kept on her old cry of 'Take two, Maggie! take two.' The

magpie insisted that this was a very unworkman-like manner of proceeding, one stick at a time being as much as could be managed to advantage, but the pigeon reiterated her 'two, take two' till Mag, in a violent passion, gave up the task, exclaiming, 'I say one at a time is enough, and if you think otherwise, you may set about the work yourself, for I will have no more to do with it.' " The unfortunate pigeon was thus left in the lurch when nothing more than the bare foundation had been laid; and being, as we have said, no architect, has not to this day been able to improve on the miserable structure.

The young of these birds when first hatched are blind, and like puppies, remain so for the first nine days of their existence. At this time they are covered with yellow down, and certainly have no pretensions to beauty, being, in fact, as ugly as when full grown they are handsome. At this time they are far from pleasant in their ways, having a disagreeable habit of puffing and snorting when approached, a habit which, according to Bewick, resulted in the death of a pair hatched under a dovecote - pigeon, the foster-mother being so alarmed at her supposed offspring that she deserted them. In common with all other pigeons, the wood-pigeon feeds its young on half-digested food from its crop. The process is curious and amusing. The young bird, instead of opening its mouth to receive the expected meal, forces its bill between its parent's mandibles and sucks out the

milky mass, thus proving, as has been aptly observed, that "pigeon's milk" is not the "absolute unfounded fable it was once supposed to be." In about three weeks' time they are fully fledged, and are then of much the same colour as their parents, except that the metallic colouring and the white ring on the neck are wanting (these appear after the first moult), and a considerable amount of yellow down is still attached to the tips of the feathers. In the autumn wood-pigeons congregate in large flocks, which remain together until the ensuing breeding season, roosting at night in woods and fir plantations, their numbers, in the Eastern counties at least, being increased by immigrants from the Continent. At this time they are most wary and difficult of approach, and from their voracity are dreadful enemies to the farmer. This bird is, indeed, possessed of so insatiable an appetite that we have often wondered how it contrives to live, and apparently thrive, as it does in London, where one would suppose it impossible for it ever to obtain anything approaching to what it would consider a "square meal." Its food consists of any grain that may be available, though, like all pigeons, it doubtless gives the preference to peas or beans, together with beechmast, acorns, and, so far as the farmer is concerned the only point in its favour, the seeds of many noxious weeds. It also feeds largely on green food, doing great damage in clover and turnip fields, especially the latter, where

it not only eats the leaves, thus seriously interfering with the growth of the plant, but also in winter destroys the roots, hollowing them out so that little is left but the shell. No better examples of the voracity of this species can be given than those supplied in the last edition of Yarrell's "*British Birds*," from which the three following are extracted. The crop of one bird examined contained 1020 grains of corn; that of another, 144 peas and 7 large beans; and the last, but certainly not the least, 231 beech-nuts.

Wood-pigeons, in common with all their congeners, are very fond of water. They are essentially thirsty; drinking, be it observed, not like most other birds, sip by sip, but as a horse drinks, at one long draught. Water is also necessary to them for bathing purposes. Their fondness for water leads the London birds to places where they may easily be observed. For example, it is not uncommon to see wood-pigeons on the island in St. James's Park, this being a favourite drinking and bathing place for the birds resorting to that neighbourhood. They may also be seen from time to time, especially by those acquainted with their habits, drinking and bathing in the Serpentine. Wood-pigeons, though among the wariest and wildest of birds in the autumn and winter, in the breeding season so change their habits as not infrequently to be found nesting in gardens, and at this time they seem to lose much of their natural fear of man. When taken from the nest or reared

under dovecote pigeons the young become tame, though they are at best but bad pets, their innate wildness inducing them, however well they may have been treated, and however happy they may appear in confinement, to escape at the first opportunity, and retire to their natural haunts in the woods. They are, in fact, incapable of domestication, only one case, so far as we are aware, being on record of a wood-pigeon remaining, when given its liberty, and mating with a dovecote pigeon, and in this case, though three nests were made and eggs laid in each of them, only one young bird was reared. There is no doubt that these birds are largely on the increase in this country, and that they are also extending their range, a fact, from the farmer's point of view, much to be deplored. Many reasons have been given for this increase, such, for example, as the greater cultivation of turnips and other green crops, the larger number of plantations. As an inhabitant of London this bird is absolutely harmless, and we hope it may be long before it becomes necessary for Londoners to journey into the country to make the acquaintance of the wood-pigeon.

THE SEA-GULL.

(March 17, 1888.)

THE sea-gull—we speak generically—is entitled to a place in the list of London birds. In the London below-bridge, the busy, mercantile, riparian London, among the docks and shipping, this bird can hardly be said to be uncommon, being at all events a frequent visitor. It does not, however, confine itself entirely to the East-end, as specimens may from time to time be seen, especially in the spring, about the waters in the parks of the West-end, the Serpentine in Hyde Park being a specially favourite resort.

During the severe weather we have lately experienced, accompanied as it has been by hard north-easterly winds and snow, Londoners have had an unusual opportunity of observing the habits of sea-gulls, as they have frequented the river above bridge, literally in hundreds, their range extending at least to Putney—in other words, from one end of London to the other. It is seldom, indeed, that these birds appear in such numbers on the Thames above London-bridge as they have done lately, and their appearance has, from its rarity, caused a corresponding excitement among Londoners, as

is proved by the numbers of people that have crowded the bridges and embankments to watch their movements. To a considerable proportion of them, no doubt, the marvellous flight and power of wing of the gull came as an absolute revelation. To those intimately acquainted with the bird and its ways, the advent of so many on the higher reaches of the river was not only a surprise, but a source of enjoyment, which no doubt induced them to form part of the crowds engaged in watching the birds. There is, perhaps, some slight cause for wonder, when we consider the habit so common to gulls of following the tide in rivers, that these birds are not more often seen in London between bridges, as food in the tideway cannot be lacking to them. The reasons of their scarceness, however, are no doubt, firstly, the crowded state of the river itself, to say nothing of the densely populated condition of its banks, and, secondly, the great distance from the sands and saltings of the estuary to which the birds always retire for the night. In addition, food is plentiful in the lower reaches ; and therefore, except in the case of such exceptional weather as we have lately experienced, the gulls find no occasion to venture into the narrow and crowded waterway of the river as it flows through London.

When we say that food is plentiful in the lower reaches of the river, we must not be understood to speak of food to be found in the river itself, or even on its banks, as the sea-gull in autumn,

winter, and early spring, before it leaves for its breeding-places, is as fond of foraging in the fields and following the plough as is the rook—with which, indeed, it may often be seen feeding in the greatest amity.

No doubt the late immigration of this bird into London was to a very considerable extent caused by the fact that its feeding-grounds on land were closed to it by the snow and frost, and that it was therefore forced to depend entirely on the water for its supplies.

The gull may be said to be omnivorous; nothing, indeed, apparently comes amiss. It will devour small fish, and for this reason is very fond of following shrimpers and other small trawling vessels for the feast to be obtained when the fishermen are shaking out their nets—mollusks and crustaceans which it finds left by the tide, and, one of its greatest feasts perhaps, the scraps and offal thrown overboard from the cook's galley of a passing ship.

So fond, indeed, are the gulls of the meal provided them by the refuse thrown overboard from ships, that they will in a harbour where a guardship is moored, apparently observing times and seasons, attend daily with the greatest regularity for the food they know will be supplied to them. In addition they will, as we have said, wander far inland in search of worms and grubs, and when so engaged will not even disdain on occasion to help themselves to the farmer's grain,

though this cannot be said in any way to be their natural food. That a gull, however, can live entirely on corn is proved by the fact that the stomach of one so kept by John Hunter is now preserved in the Museum of the College of Surgeons.

Gulls make excellent pets, and are most useful in gardens, having an illimitable appetite for slugs and a general aptitude for devouring obnoxious insects. And, strange though it may appear, considering their natural wariness and wildness, it is not necessary to obtain them young, as an adult bird, pinioned by a good or lucky shot as the case may be, will, often before its wound has thoroughly healed, have become so tame that it will come with great regularity to be fed, if it does not, as certainly will eventually be the case, know and follow the person who is in the habit of feeding it.

Gulls in captivity, or rather wandering at large in a garden, though deprived of their power of flight, are by no means the miserable birds that many would imagine. On the contrary, they are most masterful, and evidently consider themselves of very great importance. They will generally condescend to notice all the members of the household to which they belong, though naturally they have their favourites, giving their preference as a rule to those who feed them, and will possibly admit certain well-known visitors to a limited intimacy; but they usually resent the intrusion of strangers, even to the extent of pecking their heels—a far from pleasant operation for the victim,

especially if performed by a specimen of one of the larger gulls. They are, in fact, birds of great character, each individual having ways of its own.

Their noisiness—they cannot be said by their best friends to possess musical voices—is to some few people an absolute bar to their being kept as pets. We, however, can only pity those whose nerves are so highly strung, as they thereby lose, at all events, the chance of the friendship of one of these delightfully intelligent birds.

Some knowledge of these birds and their habits may be obtained by watching those in the Zoological Gardens, where a considerable number are kept, pinioned and in a semi-domesticated condition, yet living so happily, that many of them nest in the spring, though we fear with, as a rule, little satisfaction either to themselves or their keepers. Here the birds may be seen in all states of plumage, from the mottled brown of the first year to the pure white and grey and black of the adult. Since the large aviary was built last year, matters have been so ordered that some of the smaller gulls may be seen unpinioned, and, therefore, able to use their wings.

In London, as we have said, gulls are only occasional visitors, and the Londoner must go far from town to make certain of seeing them in all their beauty.

THE THRUSH.

(Sept. 22, 1888.)

THE song-thrush, or mavis, is one of the best known and best loved of British song-birds, and with reason, as not only is it one of the best of singers, but, with the exception of its cousin, the missel-thrush, or storm-cock, as it is called in some counties, it is the first bird that by its song suggests the coming spring. No sooner has the new year begun than, given a few warm days, the thrush may be heard from its favourite post, on one of the higher branches of a tree, piping—in half-hearted manner, it is true, and as if it were almost ashamed of its presumption, but still delightfully.

As a London bird the thrush is far from uncommon, being found in all the parks and in most of the larger gardens and pleasure-grounds of the inner suburbs. In the outer suburbs, where houses are fewer and gardens more plentiful, this bird is almost as common as it is in the country. It is essentially a “homely” bird, fond of human society, as is proved by the fact that it will nest in gardens, often close to much-frequented paths. The nest, which is one of the most compact of bird

structures, is built of small sticks or roots, dry grass, straw, and moss, the whole mass being intermixed with clay. The interior, which is about three inches in diameter, is lined with a plaster composed by the bird of clay, horse or cow dung, and rotten wood, thoroughly mixed and compacted with its own saliva, and has been well described as being "about the form and size of a large breakfast teacup, being as uniformly rounded and, though not polished, almost as smooth." The whole forms probably the best protection that could be devised against the bitter winds of the early spring, in which this bird commences to breed; but from its very excellence the nest is occasionally the cause of disaster, as, being watertight, a heavy rain may fill it when some only of the eggs have been laid, and therefore before the hen has begun to sit.

The nest is generally built in a thick shrub, bush, or hedge; but the bird is far from particular, adapting itself very much to circumstances, so much so that it will on occasion if no better position can be found, build in a shed or outbuilding, and even—but this is very rare—upon the ground. The eggs of the thrush, of which from four to six are generally laid, are probably better known than those of any other British bird, not even excepting the ubiquitous sparrow. The reason of this is doubtless that the nest is large and easily to be found by the most inexperienced birds'-nester, and that the eggs, from their colour

and markings—blue-spotted and streaked with black—are noticeable and unlike those of any of our other birds. The cock-bird certainly cannot be accused of laziness, as not only does he take his turn from time to time upon the nest during the period of incubation, but also attentively feeds the hen while she is sitting.

Thrushes are early breeders ; so early, indeed, that with the first warm days of the new year the cocks begin, as we have said, to sing—a certain sign that they are preparing to nest. Gilbert White, indeed, “laid it down as a maxim in ornithology that so long as there is any incubation going on there is music.” This year they were singing in the latter end of January ; but the terrible weather that followed the comparative warmth of that month drove for the time all idea of nesting from their minds, if, indeed, it was not the cause of death to many of them, as they are, strange though it may appear with such apparently hardy birds, most susceptible to cold, especially if accompanied by snow. In this respect the London birds are better off than those that live in the country, as not only can they find more shelter from the inclemency of the weather, but they have more chance of being fed by human friends. This fact the birds of the district round London are apparently capable of appreciating, as in very hard weather they move into town, and may then be seen in considerable numbers.

This bird is well named the song-thrush, its

note being rivalled only by that of the nightingale, and we must admit that, in our opinion, there is little to choose between them. Of the birds that remain with us throughout the year the thrush is, at all events, *facile princeps*, and, in addition to its other good qualities, it has in its favour the fact that, while beginning to sing earlier in the year than most birds, it continues in full song throughout the summer, and often sings again in the autumn after its moult, long after the generality of birds have become silent. It is also apparently untirable, beginning its song with the dawn and ending only with darkness; so late, indeed, will it sing that we have often late in the evening been called out, in most impossible places, to hear a nightingale, only to find, as we supposed would be the case, that a belated thrush was in full song.

Unlike most birds—we speak of songsters as distinguished from birds having merely a call note—the thrush has a song which can be translated into words, nonsensical, no doubt, but nevertheless conveying the song most exactly—in fact, to quote the late Frank Buckland, the bird does actually sing the following words:—“Knee deep, knee deep, knee deep; cherry du, cherry du, cherry du, cherry du; white hat, white hat; pretty joey, pretty joey, pretty joey.”

Thrushes are without doubt most destructive to small fruit when ripe, but the damage they do to the gardener in this way is more than compensated

for by the immense amount of good they do him the year through by destroying snails, slugs, and other pests of the garden. As Yarrell remarked, "Prudent gardeners, who surround their fruit with nets, have nothing to fear from the song-thrush, and much for which to be thankful." In London, at all events, their song would always secure them a welcome were they the most mischievous of birds. Snails are among their greatest delicacies, and it is most amusing to watch the dexterity with which one of these birds will rid the snail of its shell by knocking it against a stone, the same stone being used continually until quite a heap of broken shells is collected round it.

Thrushes, though many remain with us the year through, are distinctly migratory, moving from north to south and *vice versâ* with great regularity. So far as London is concerned, the larger number of young birds leave at the end of summer never to return. Still, in the parks at least, the number of these birds remains fairly constant, and we hope and believe that it will be many years before they cease to be the home of the song-thrush.

THE REDBREAST.

(Nov. 17, 1888.)

PROBABLY no bird is better known than the Redbreast, yet we doubt if there are not thousands of Londoners, even amongst those who should know better, who would be surprised to hear that it is by no means the rarest of the birds of London. It does not, of course, frequent the streets; but in the parks, and wherever there are trees and gardens, it may be found penetrating, especially in the winter, in considerable numbers into the inner suburbs. Kensington Gardens is one of its favourite haunts, and there it may be seen at any time of the year; it is also fond of the shrubberies in St. James's Park. Many birds possess, and are ordinarily called by, human names. "Mag" pie, "Jack" daw, "Tom" tit, are familiar instances among others which will occur to everyone; but "Robin" Redbreast stands alone, so far as we are aware, as the bird which may be said to have dropped its proper name, and to be generally known by its prefix, as most people apparently think that "Redbreast" is nothing more than a pet name, and that the bird should be known as the "Robin."

Robin Redbreast is an amusingly impudent bird,

showing in all its tricks and ways that it has absolutely no fear of man. This fearlessness is, no doubt, to a certain extent, the result of its immunity from persecution, as for centuries legend and tradition have so favoured it that the schoolboy is chary of even touching its nest, as he has a vague notion that something uncanny will happen if he in any way injures a robin. The origin of this superstitious feeling in its favour is lost in the mist of antiquity, but its beauty and its winning ways are in themselves sufficient to account for the love bestowed on it. Beauty the redbreast certainly possesses, which even the grime and dirt of London cannot destroy, as its bright full eye and fearless carriage have a charm of their own quite apart from its plumage. Of its excessive tameness and of its winning homely ways numberless tales have been told, to which most people could add from their own experience, as it has been well said that redbreasts in the winter become "almost domesticated." There is a very common belief that in the spring these birds leave the neighbourhood of houses and retire into the woods to breed. This is certainly not true of the main body, and we agree with Rennie that "a great number do not go further from their winter haunts than the nearest hedgerow." Many, indeed, do not go so far, but build in gardens, often choosing such places as summer-houses and tool-sheds, or holes in walls, especially if covered with ivy, for their nests, and this applies especially to the birds that make

their homes in London and its suburbs. Red-breasts often choose extraordinary places for their nests, such as flower-pots and old kettles, and many cases are on record of their having nested in rooms to which they have had access through windows which have been kept constantly open. But perhaps the most extraordinary position ever chosen by one of these birds for its nesting-place was the interior of a human skull, in the well-known bone-crypt under the church at Hythe, in Kent.

At the end of summer the old birds retire as much as possible into seclusion during their moult, leaving the young in possession of their haunts. On their return many a battle-royal takes place, and old-world tales would lead us to believe that the young birds drive off their parents. The process, however, is, in fact, reversed, and it is the old birds that, as a rule, remain in possession, while the young are sent out into the world to seek their fortunes; and certain it is that redbreasts migrate to the southward in very considerable numbers during the autumn. As soon as cold weather sets in another movement takes place, and the birds close in upon houses and outbuildings, knowing that in such places they are sure to find food, and at this time there is a strong immigration into London, and even in the inner suburbs they become far from uncommon, being found wherever there are gardens of any size.

The food of the redbreast varies with the seasons. During the greater part of the year

insects and worms form the chief part of its diet; but in the summer it feeds largely on fruit and berries. Gilbert White, indeed, gave it as his opinion that, “notwithstanding the prejudices in their favour, they do much mischief in gardens to the summer fruit.” In the winter they may be said to be omnivorous, nothing coming amiss to them—a fact which can be vouched for by those who are in the habit of throwing down food for birds during hard weather.

Its song, continued as it is “the year round, hard frost excepted,” would, had it nothing else to recommend it, make this bird a universal favourite. Many suppose that it is only an autumn and winter songster; but this is a mistake, for, as we have said, it sings at all seasons, but in the spring and summer its sweet little song is lost in the chorus of louder voices.

Belon, a French naturalist of the sixteenth century, published, among other works, a quaint book called “*Portraits d’Oyseaux, Animaux, &c.*,” which, as the title implies, contains figures of birds, and, to use the writer’s own words, is “*enrichy de Quatrains pour plus cognoissance des Oiseaux et autres Portraits,*” in which he writes as follows of the redbreast:—

Au Rossignol de muraille ressemble
La Gorge-Rouge, en chant armonieuse.
Elle en hyver apparoist fort ioyeuse,
Luy en esté auprès de nous s’assemble.

The comparison of its song with that of the

redstart is not unfair, but it was surely unnecessary in turn to compare the redstart as a songster with the nightingale, as he does in his description of that bird, which is as follows :—

Ce Rossignol est nommé de muraille
Pource qu'es murs il bastit sa maison,
Fait ses petits : mais en comparaison
Au Rossignol, il ne dit rein qui vaille.

Its name, perhaps, caused the invidious comparison, though all three birds, in fact, belong to the same family.

Many people prize the redbreast as a cage bird not only for its song, though it is a free singer in confinement, but also for its tameness and friendly ways, and with proper attention it will thrive in captivity and live for years, though like all “soft meat” birds it requires very great care in feeding. Frank Buckland stated that Londoners were particularly fond of robins as pets, but we cannot vouch for this. Its pugnacity, however, is so great that it cannot be kept successfully with other birds, and is therefore not often found in aviaries. So pugnacious, indeed, is it, that it will not allow another bird of its own species—its mate always excepted—to intrude upon the space which it considers its own domain, and will even endeavour to drive off other small birds.

One of the redbreast's peculiarities is its love of human society, and this is curiously exemplified in the case of those birds that live in woods and other solitary places, as they invariably find out and

attend closely upon anyone who approaches their haunt if he only stand still for a moment or two. No doubt this habit is much the result of cupboard love, as the birds have found from experience that human beings more often than not disturb the surface of the ground, and thus supply them with a meal of worms and insects. In London the redbreast never appears to us quite so sociable as in the country, where it enters houses freely, especially in the winter; but wherever it is found, whether in town or country, it is a sociable, inquisitive, truly pugnacious, and most lovable little bird.

THE HEDGE-SPARROW.

(Jan. 19, 1889.)

THE hedge-sparrow, or dunnoek, is not only one of the most familiar, but also one of the most harmless, of British birds. As Bewick remarks, "it has no other relation to the sparrow than in the dinginess of its colours; in every other respect it differs entirely." Indeed, it belongs to the genus *Accentor*, of which it is the only resident British representative, its cousin, the Alpine accentor, being only an occasional visitor to this country. Its slight resemblance in plumage to the sparrow was doubtless the cause of the name "hedge-sparrow," by which it is most commonly known; an unfortunate name, which has, without doubt, caused the destruction of thousands of its species, as many persons think that, as it is called a sparrow, it must be mischievous. Attempts have from time to time been made by different writers to change this name—hedge-accentor, hedge-chanter, and hedge-warbler being among the new names suggested—but always without success; for hedge-sparrow it was, as we know, in Shakespeare's time, and hedge-sparrow it will remain—at all events in those parts where it is not

known by its other familiar name of dunnock. Oddly enough, this bird has two human names, "Dick" and "Molly," being known as Dick Dunnock and Molly Hedge-sparrow; in many places the latter name is dropped, and it is known simply as the Molly.

The hedge-sparrow is not uncommon in London, and, like the redbreast, is found in the Parks, and, practically, wherever there are shrubs and gardens of any size; the dinginess of its plumage, which in the smoke and dirt of town becomes almost black, and its habit of never going far from shrubs and bushes, render it, however, less observable than that bird. The fact that it is found in London will not surprise those acquainted with its habits, for it has been well described as "our most domestic bird," and certainly appearances favour the idea that it delights in human society, as it is to be found at all times near houses, in gardens, orchards, and shrubberies. In the spring, no doubt, many retire to the hedges and woods to breed; but, like the redbreasts, they, as winter approaches, again draw near to the neighbourhood of houses, and at this time many find their way into London.

As we have said, the hedge-sparrow is one of the most harmless of British birds, feeding as it does on insects, worms, and seeds. In hard weather, as Gilbert White tells us, it "frequents sinks and gutters, where it picks up crumbs and other sweepings," and it will always be found

among the birds coming to be fed where food is spread for them in the winter-time. Gilbert White also tells us that "in mild weather they procure worms, which are stirring every month in the year, as any one may see that will only be at the trouble of taking a candle to a grass plot on any mild winter's night." Many persons accuse the hedge-sparrow of taking fruit, and even peas, in the summer-time; but not only is it innocent of the offences so laid to its charge, but in reality it is a friend to the gardener.

These birds are generally seen in pairs, and have been well described as unobtrusive, quiet, and retiring, without being shy. They may generally be seen on lawns, though never far from cover, moving about in search of food with a cheerful, jerky gait, and continually flitting their wings in a way peculiarly their own. This curious motion of the wings is doubtless the origin of "Shufflewing," one of the bird's many names. They are very early breeders, pairing as they do in the beginning of February, at which time the cock may be heard constantly singing his quaint little song, which, though deficient in variety, is very pretty and sweet in tone. Like the red-breast, he continues his song practically the year through, singing as he does at all times, except during his moult and in very hard weather. Bewick said of the hedge-sparrow:—"Its song is little varied, but pleasant, especially in a season when all other warblers are silent; its usual

strain is a sort of quivering, frequently repeating something like the following, 'tit-tit-tititit,' from which in some places it is called the 'Titling.' The nest is a rather loose structure of twigs, roots, green moss, and wool well rounded internally, and lined with hair. So neat is this lining that Rennie suggested that the birds must moisten the hairs to make them wind, since otherwise it would not be easy to account for the neatness of the work. It is placed in a bush or hedge, usually low down, or—favourite places with these birds—in the heaps of faggots, pea-sticks, brush, and rubbish so often found in gardens and shrubberies. The eggs, from four to six in number, of a uniform light blue colour, are laid often early in March, and, therefore, before the bushes and hedges are in leaf, the consequence being that they not infrequently become the prey of bird's-nesting boys. Cuckoos are particularly fond of depositing their eggs in the nests of hedge-sparrows, a circumstance evidently well known to Shakspeare, as he made the Fool in "King Lear" say

For you trow, nuncle,
The hedge-sparrow fed the cuckoo so long
That it had its head bit off by its young.

This apparent preference is probably accounted for by the fact that the nest is easily found, as little art is used in concealing it. Frank Buckland expressed the opinion that one pair of hedge-sparrows could not feed such a glutton as a young

cuckoo, and that other birds, attracted by its peculiar cry, must help the foster-parents. Be this as it may, it is an undoubted fact that many cuckoos are yearly hatched and brought up by these birds. Hedge-sparrows are occasionally kept in captivity; they thrive in aviaries, and, being of a peaceful disposition, are not given to interfering with the other birds, though some people complain that they are unsociable. When so kept they will eat canary seed, breadcrumbs, paste, &c., but they look upon an occasional meal-worm as their gréatest luxury.

In London hedge-sparrows breed regularly in Kensington Gardens, being particularly fond of the Flower Walk and the private gardens surrounding the Palace, where some of them may always be seen the year through. And, generally, we do not think their numbers are diminishing in the Parks, or, indeed, in any part of London or the suburbs, where they are not driven out by the builder.

TITMICE.

(Feb. 9, 1889.)

TITMICE are common in the inner suburbs of London and by no means rare in the Parks, Kensington Gardens especially being a favourite haunt, and the fact that they are not more generally known shows how little observation, at least in matters ornithological, is possessed by the average Londoner. Three species of the genus *Parus*—the Great-Tit, the Blue-Tit, and the Coal-Tit—may from time to time be seen, but the second is by far the commonest, and is always to be found where there are large gardens. All three species are much alike in their ways and habits, and are among the merriest and most active of birds, being indeed perfect little winged acrobats, to whom it is a matter of indifference, when climbing about trees or shrubs, whether they are hanging back downwards while clinging to some slender twig or perched securely on a bough. They are also extremely fearless of man, and while busily engaged in searching for insects, their favourite occupation, will allow of a very near approach without apparent distrust.

The blue-tit is, as we have said, the commonest

of the three, not in London alone, but throughout the country; it is also, in our opinion, the most beautiful—indeed there are few British birds that excel it in beauty, though—the result no doubt of its being very common—it is not appreciated and admired as it should be. Not only is this the commonest of the tits, but it is also the most friendly, delighting as it does in gardens and orchards. Its food, like that of the others, consists principally of insects, though it is, especially in the winter-time, as Gilbert White said, “a general devourer” and “a vast admirer of suet.” Gardeners consider it one of their greatest enemies, but in this they are in the wrong, as, indeed, is not uncommon with that most “opinionated race,” when birds are in question. They see it at work among their fruit-trees, and because it plucks off buds and scatters them on the ground, they declare war against it, either forgetting or being ignorant of the fact that it is not the bud, but the insect it contains, which is attractive to the bird, and that uninfected buds are safe from it.

It is, in fact, doubtful whether birds of this species are at any time vegetable feeders, though many authors declare them to be so. But both the great-tit and the coal-tit undoubtedly eat both seeds and berries, the former being particularly fond of the seeds of the sunflower. Darwin said of the great-tit, “It sometimes, like a shrike, kills small birds by blows on the head; and I have many times seen and heard it hammering the seeds

of the yew on a branch, and thus breaking them like a nuthatch." Titmice, blue-tits especially, are very fond of meat, and by no means object to it if rather high; they are generally found about the horseflesh and other carrion hung up near dog-kennels, and a bone, a lump of suet, or, as Jardine suggested, the skeleton of a cooked fowl, if hung up in a garden, will surely attract the titmice, if any are in the neighbourhood; and to the bird-lover nothing is more delightful than to watch the marvellous activity of these little acrobats as they swing securely on the tempting morsel without fear of disturbance by other birds, as they alone can keep a foothold.

Titmice, especially great-tits, are held in great horror by many bee-keepers, who declare that they are their greatest enemies, and accuse them of tapping at the entrances to the hives, and snapping up the bees as they come out to discover what is amiss. Though, no doubt, they do occasionally destroy a few bees, we cannot but think that the mischief they do is much exaggerated, and are pleased to say that in this opinion we are now supported by many bee-masters. Titmice are wonderfully noisy, garrulous little birds, especially in the spring-time, when the notes of the cocks rise to the dignity of what, in lieu of a better expression, we must call a song, though they are certainly not harmonious. The great-tit is, indeed, called the "Saw-sharper" in some parts of the country, the name being doubtless due to the fact

that some of its notes much resemble the sound made when sharpening a saw. Notwithstanding that the song has little melody, it is wonderfully lively and pleasant, and was evidently much admired by Belon, who, in his "*Portraits d'Oyseaux, &c.*," wrote as follows of the great-tit and the blue-tit respectively:—

Au temps d'Autonne il y a des mesanges,
 En grand foison, qui bautent par les boys,
 Et font des œufs douze ou quinze par fois
 Oyseaux petits et qui chantent comme anges.

and—

L'esté es bois la mesange bleuë est,
 Et nous vient voir en Hyver et Autonne,
 Le doux chanter d'icelle plaisir donne,
 A tout esprit, a qui l'escouter plaist.

These birds are early breeders, and their "note of incubation" can be heard in February. They build their nests in holes, in trees, walls, rocks, or banks; and there is little doubt that, if a hole suitable for their purpose cannot be found, they will hew one out for themselves, even, in the case of a wall, removing mortar and small stones for the purpose. They are, however, by no means particular, and often choose most extraordinary nesting-places, such as the inside of a pump, the frame of a window, or an inverted flower-pot or bottle. In London we have known a blue-tit build her nest and hatch her young in the interior of a lamp-post, to which she obtained access through a small hole. But perhaps the most extraordinary

position on record is that mentioned by the Rev. F. O. Morris, when a blue-tit built its nest "within the jaws of the skeleton of a man who had been executed and hung in chains for murder."

A remarkable instance of the persistence with which these birds will use the same nesting-place year after year is given in the fourth edition of Yarrell's "*British Birds*," the facts being as follows:—Either in 1779 or 1785, for on this point accounts differ, a pair of blue-tits built their nest in a large earthenware bottle which had been left to drain in the branches of a tree in a garden at Oxbridge, and, the bottle being allowed to remain, they used it year by year for the same purpose until 1822, when, the tree becoming decayed, the bottle was placed in one near by, and the tenancy continued, with only two interruptions, until 1873, the date of the publication of the book. The nest is composed of moss, hair, and feathers, and in it the eggs, white, prettily spotted and speckled with red, usually from seven to nine in number, are placed. The hen bird, more especially in the case of the blue-tit, is most courageous in defence of her eggs and young, and will fight stoutly if disturbed, puffing out her feathers and hissing the while like a snake or an angry kitten, and the boy who boldly puts his hand into the hole containing her nest generally gets well pecked by the irritated matron for his pains. This habit is without doubt the origin of Billy Biter—the school-boy's name for the bird. She will not only fight

as described, but so devoted a mother is she, that she will even allow the branch containing her nest to be sawn off and carried to a distance without deserting her eggs. The young birds, which resemble their parents, with the exception that their colours are not so bright, remain together until the ensuing spring; thus forming little troops, they may be seen flitting together from tree to tree in pursuit of food.

All London birds suffer from the dirt and grime of town, but titmice, from their habit of creeping about the trunks and boughs of trees and shrubs, lose all their beautiful colouring and become, especially after such a series of fogs as we have lately experienced, the blackest and grimest little birds imaginable. But whether clean or dirty they are always sprightly and most friendly, and will never fail to afford amusement by their antics to those who, being lucky enough to possess gardens, encourage them by supplying for them their favourite dainty, a bone or a piece of suet.

THE BLACKBIRD.

(March 9, 1889.)

FEW British birds are better known than the black-bird, the glossy black plumage and bright orange bill of the cock being sufficiently noticeable, and it is therefore wonderful that anyone should doubt its right to a place in the list of birds of London. Like the thrush, it frequents the Parks and large gardens of the inner suburbs, but is not so common—or perhaps it would be more correct to say, is not so widely distributed—being somewhat local. The “flower walk” in Kensington Gardens, for example, is one of its favourite haunts, and there as many as five or six may occasionally be seen together in the winter picking berries from a tree, and in the spring and early summer the cocks can always be heard singing.

Again, though it frequents the same localities as the thrush, it is by no means so bold a bird; it has a great objection to going far from cover, and when in the open has a curious, suspicious, listening way, and is always ready, on the slightest provocation, to dash back into shelter. When suddenly alarmed, it flies off with a peculiar startled cry, and, after a short flight, turns almost

at right angles into cover—a habit which always attracts attention to it. Where, however, through living in much-frequented places, it is not liable to sudden alarms, its shy habits render it less observable than the bolder thrush.

The song of the blackbird, though wonderfully rich and mellow, has but little variety, and is, in our opinion, poor in comparison with that of the thrush. The bird begins to sing early in the spring, and continues his song, with short intervals of silence, throughout the summer, singing his best early in the morning and in the evening. The song, unlike that of many other birds, has not, so far as we are aware, ever been put into words.

The blackbird is an early breeder—so early, indeed, that during the abnormally warm weather in December last several cases of blackbirds nesting were recorded, the birds evidently being deluded into the belief that spring had begun. The nest is a most solid structure of roots, grass, and clay, carefully lined with fine dry grass, the whole forming a wonderful protection from the weather; but occasionally such extraordinary substances as paper or rags enter into its composition, and Frank Buckland recorded and published an illustration of one which was festooned with pieces of lace, some of which were worked in and out throughout it. It is usually placed in a thick low bush, by preference an evergreen, but now and then a high tree is chosen, and cases have been known where the nest has been built

on the ground; indeed, the bird is by no means particular as to situation, occasionally choosing most unlikely places in which to build; perhaps the most extraordinary on record being the crown of a water-pipe under the overhanging roof of a house, a position admirably adapted for a sparrow's nest, but certainly not one in which a blackbird's might be expected.

The eggs, from four to six in number, are greenish blue, thickly spotted with dull red, and as a result of the size of the nest, and the little care taken to conceal it, often fall a prey to bird's-nesting boys. This is perhaps not altogether to be regretted, as blackbirds are very prolific, having two and three broods in the year, the same nest occasionally doing duty for the whole season. The "leading case" was supplied by a pair of London blackbirds, which in the year 1837 built four successive nests upon the island in St. James's Park, and safely reared and brought off seventeen young ones, the first three broods consisting of five each, the last of two only.

The young in their first plumage are curiously spotted, especially on the breast—in this stage the cocks may be distinguished, as they are darker than the hens, and the spots on the breast are more distinct. After the first moult they lose their spots, and are then of a dark rusty brown, very much like the hen, but darker; the adult plumage is attained in the ensuing spring.

The food of the blackbird varies with the seasons,

and in the summer it cannot be denied that it is a great devourer of fruit, cherries, strawberries, and, in fact, all small fruit, where not protected by nets, suffering severely from its attacks. We cannot, however, admit that it is such a deadly enemy to the gardener as it is popularly supposed to be, as it feeds for the greater part of the year on insects and their larvæ, together with worms, snails, and slugs, thus doing him immense good, while the time available for mischief is by comparison very short.

Many gardeners, while refusing to kill thrushes, will ruthlessly destroy blackbirds under the mistaken idea that, though both are fruit-eaters, the former alone makes amends for the mischief they do by destroying slugs and snails. As a fact, there is little to choose between the two birds in this respect, the blackbird being as fond of shell snails as the thrush, and adopting the same method of obtaining them.

Others, again, maintain that the blackbird is more persistent in its attacks upon fruit than its cousin the thrush. In this also they are mistaken, though the mistake admits of easy explanation. The plumage and habits of the thrush are all in its favour, as its colour enables it to peck away at the fruit without being seen, and when disturbed it steals away without any noise. The blackbird, on the contrary, at once attracts attention by its sharp cry of alarm, if, indeed, its black coat and yellow bill have not

already betrayed its presence. Both birds should, in our opinion, be protected, and the fruit they eat be regarded as given in payment for services rendered. London birds, however, have little to fear from the gardener, as fruit-growing is not carried on to any extent in suburban gardens.

Like many other birds, blackbirds in hard weather draw near to houses and homesteads; and at such times many find their way into town, where they lose their shy habits and become excessively tame, especially if the ground is covered with snow, and will take food, even when placed close to a window, with hardly more hesitation than is shown by the impudent sparrow.

Blackbirds, when reared from the nest, make excellent cage-birds, and become very tame and companionable; but in aviaries they are troublesome, as they are excessively pugnacious, and harass other birds. They are perfect mimics, and may be taught to whistle simple tunes; they will also imitate the songs of other birds, and have been known to crow like a cock, and cackle like a hen; and some authors go so far as to affirm that they will even imitate the human voice.

In the country blackbirds, from their habit of suddenly dashing out of cover, flying straight away, and as suddenly turning in again, are considered to afford excellent sport for boys who learn to shoot, and hundreds are yearly killed in this way. Blackbird hawking, again, is a recognised

form of sport ; but is followed by so few that it does little to lessen the number of blackbirds. And, lastly, great numbers are, as we have said, killed by gardeners during the fruit season. Yet, notwithstanding all this, their numbers appear to suffer no diminution. In London, however, where the bird has practically but one enemy — the prowling, ubiquitous cat—we doubt if it would not long ago have been extinct were not its numbers continually recruited by immigrants from the country.

THE DAW.

(May 11, 1889.)

THE daw—or jackdaw, as it is generally called—is a particularly sociable bird, fond of human society, and consequently much given to frequenting towns, where it seems quite as much at home as it does in the country. It is therefore, not surprising that London possesses colonies of these birds, which do not, indeed, live and breed in the heart of the city, but are far from uncommon in the suburbs. Kensington Gardens is much frequented by them, one of their favourite resorts being the meadow at the back of Palace Gardens, where they are generally undisturbed. They are, however, by no means shy, and do not confine themselves to the parks and open spaces, but may be seen at all times of the day flying over or settling on the roofs of houses on the look-out for anything they can pick up, and they share with the cats and sparrows the bits of broken food which are thrown out into the gardens and backyards of suburban houses, pouncing down, when they think themselves unobserved, upon any choice morsel and carrying it off to some neighbouring roof for consumption. The early morning, before the daily traffic has

fairly begun, is the London jackdaw's time of greatest enjoyment, as it can then forage undisturbed, and at this time, especially in the summer, when there are several hours of daylight during which there is practically no traffic, it may not uncommonly be seen in the deserted streets breakfasting, *inter alia*, on the grain which is always to be found in considerable quantities about cabstands.

The jackdaw is decidedly omnivorous; nothing eatable apparently comes amiss to it; worms and insects, grain and fruit, are equally acceptable; and, as Jardine said, "in the midst of cities and towns it is never at a loss, and will indiscriminately feed on almost any kind of offal." In gardens it is mischievous—so much so, that even Waterton, who certainly could not be accused of giving any bird a bad character if he could truthfully avoid it, was forced to confess that "it is vastly fond of peas and cherries," though he added that he could not imagine how any one could "bring his mind to drive away this playful, merry bird, or allow his gardener to take its life for the value of a handful of cherries."

During the breeding season it attacks the nests of other birds, devouring their eggs and young, and carrying off the latter to feed its own nestlings; it destroys many young sparrows in this way, but often takes larger birds; for example, we have known a pair of jackdaws to take all the young from a thrush's nest in the course of a

morning, and we have little doubt, though we have never actually caught it in the act, that the daw is responsible for the disappearance of many a weakly chicken, and it is certainly destructive to very young game. However, like its congener the rook, with which it so often associates, it does sufficient good by the destruction of noxious insects to counterbalance the mischief it does in other ways. Among other insects which it destroys are the parasites of sheep, during the search for which it may often be seen perched on the backs of these animals; in return for the service so rendered it supplies itself at the expense of the sheep with wool with which to line its nest.

The nest is built of sticks, and is lined with soft materials, such as wool, grass, and hair. In towns the birds choose as nesting-places church towers, disused chimneys, ruined buildings, hollow trees, or, as we have sometimes seen in London, the holes left for fireplaces in the walls of partially finished rows of houses. In the country similar positions are chosen, with the addition of cliffs, chalk-pits, and occasionally rabbit-burrows. Most people give the jackdaw credit for a considerable amount of sense, but this is certainly not shown in its nesting, wherein, to again quote Jardine, "it often exhibits a great want of instinct"; its one idea, apparently, being that, having found a hole which it considers suitable for its purpose, it must fill it with sticks regardless entirely of its size, which idea occasionally leads it, like "Baker's blue-jay," into the

ridiculous position of endeavouring to fill a house, the only difference being that, while the blue-jay dropped acorns through a knot hole in the roof, the jackdaw drops sticks down a chimney, the result in both cases being equally unsatisfactory to the labourer.

It is astonishing what an enormous mass of sticks one pair of jackdaws will collect, as will be seen from the following among other recorded cases. One nest which was built in seventeen days in the bell-tower of Eton College Chapel formed a solid pillar ten feet in height, while another in Hillington Church, in Norfolk, which took three weeks to build, completely blocked up the tower stairs by a substantial mass some twelve feet in height and a cartload in bulk. Again the Rev. F. O. Morris expresses the opinion that the immense masses of sticks heaped together by jackdaws in the western towers of York Minster "formed a most unfortunate kind of firewood for the tremendous conflagration" which took place there.

The young are hatched at the end of May or beginning of June, and seem to have a curious knack, when half-fledged, of falling out of the nest; as, where jackdaws are plentiful, young ones may often be found on the ground under the nests, uninjured, but unable to fly. When so caught, or when taken from the nest, they are by no means difficult to rear, and make most amusing, but dreadfully mischievous, pets; they become wonder-

fully tame, and can be taught to imitate a few words.

Whether at liberty or in confinement, they have a peculiarly impudent, self-satisfied air, with a knowing way of putting their heads on one side and looking out of the corners of their bright, greyish-white eyes, which gives them a comical appearance of being full of all worldly wisdom. Jackdaws are noisy birds, constantly repeating their sharp shrill cry, which is certainly not musical, but is a wonderfully pleasant sound in our opinion, especially when repeated simultaneously by a whole flock, after the manner of these birds.

Jackdaws hold their own in London far better than many other birds, but are certainly not so plentiful as they were some years since; but we hope and believe that it will be many years before they cease to be reckoned among the birds of London.

WOOD-PIGEONS IN THE PARKS.

(July 4, 1891.)

THE enormous increase during the last few years in the number of wood-pigeons frequenting the London Parks must have struck the least observant. Formerly a few pairs bred there every year, Kensington Gardens and the grounds of Buckingham Palace being their favourite nesting-places; but a few years since their numbers began to increase, and they are now—sparrows always excepted—the commonest of London birds, and are certainly, without any exception, the most noticeable. Curiously enough the greatest increase has taken place in the most frequented parts of the Parks, the head-quarters of the birds being situate in the district lying between the eastern end of the Serpentine and the Birdcage Walk, omitting the Green Park; and they now frequent the district literally in scores, and many breed there. The “Dell” and the enclosed lawn on the north side of Rotten Row are very favourite resorts, and large numbers may always be seen there during the summer and autumn, especially after the young birds have flown; but St. James’s Park is also a favourite

breeding-place, and has a very considerable contingent. Curiously enough, however, they do not confine themselves to the Parks. For example, a pair nested last year—and, we believe, brought off their young in safety—in the elm tree over the fountain at the end of Great George-street, Westminster. This spring they again built a nest, laid their eggs and began to sit; but, owing to the backwardness of the season, they were in full view of all the passers by, and we have reason to believe that their eggs were taken; at all events, the nest was deserted.

One of the most noticeable characteristics of the Park pigeons is their excessive tameness, which seems to have grown as their numbers increased. They walk about most unconcernedly within a few feet of the constant stream of pedestrians; and especially in St. James's Park, are ever on the alert for the food which is often thrown to them; indeed, four or five may frequently be seen, in company with a small army of sparrows, almost at the feet of some person who is feeding them with pieces of bread or grain. This excessive tameness is curious, as, though it is well known that wood-pigeons during the breeding season so far alter their ordinarily wild habits as often to choose their nesting places in very close proximity to houses, they never seem thoroughly to lose their native wariness and fear of man, whereas the Park birds are very nearly, though not quite, as tame and fearless as the dovecote pigeons

which frequent Palace Yard, St. Paul's Cathedral, the Guildhall Yard, and other open places, and that not only during the actual time of breeding but during the whole of their stay in London, which, we may observe does not extend the year through, as they leave town for the winter. The extraordinary tameness of the birds will be best appreciated by those who have shot "dows," as they are called in the Eastern Counties, and who have, therefore, had experience, of their extreme wariness and timidity in places where, owing to their mischievous and destructive habits, they are subject to constant persecution, and is an instance of the confidence shown by birds living under circumstances which render them free from fear of molestation.

The increase in the number of wood-pigeons has certainly added a charm to the Parks, as they are beautiful birds, whether seen on the ground or on the wing and, though the London smoke and grime darkens the brightness of their plumage, it cannot destroy it. At this time of the year many young birds are about which may easily be distinguished from their parents by their duller tints and by the absence of the extremely noticeable white ring on the neck from which the bird obtains one of its names—the ring-dove.

BIRDS IN FROST.

(Jan. 24, 1891.)

FROST and snow are terrible enemies to birds, and a prolonged spell of hard weather such as that which we are experiencing, and which will make the winter of 1890-91 a memorable one, brings untold misery to all our birds, and absolute starvation and death to a vast number of them. The movements of birds during such times of hardship are extremely interesting, and it is curious to note how completely many species change their habits in the endeavour to adapt themselves to their altered surroundings.

When the ground is hardened and frost-bound most of the insect and worm feeders are put to sore straits; but when, in addition to the frost, a mantle of snow covers the ground, and, as has been the case for weeks during the present winter, even the rivers and streams are full of ice and snow, the whole economy of bird life is disorganised, and there are but few birds that do not find some alteration in their usual habits necessary. At such times the inland waters are deserted, and wild fowl of all sorts, frozen out of their accustomed haunts, flock to the coasts and estuaries, their

numbers being constantly increased by arrivals from the still more frozen North; while gulls, on the contrary, are inclined to leave the sea and follow rivers, often to a very considerable distance from their mouths, a fact which is apparent to anyone who has noticed the large number of these birds that have frequented the river "above bridge" during the continuance of the frost. Everyone, however, has not the opportunity of noticing the habits of water-fowl; but land birds are practically ubiquitous, and can, therefore, be studied by most people.

As is now well known, most birds are more or less migratory; even the redbreast, popularly supposed to be a pattern of all the stay-at-home virtues, not being exempt from the habit; but times of frost and snow make wanderers of many that in open weather would have been content to stay the winter through with us, and the rush of birds of all sorts to the South before the advancing wave of cold during the first few days of the present frost in the latter part of November was most noticeable, and was a sure sign of what was in store for us. Many, again, though they do not leave the country, at such times of hardship become, to adopt Mr. Seebohm's happy expression—though perhaps not quite in the sense in which he uses it—"gipsy migrants," wandering up and down the country, here to-day and gone to-morrow, in search of food.

But perhaps the most noticeable effect of long-

continued frost on birds is that it makes them draw near to human habitations, and even in many cases to penetrate into towns, and at such times the fields and hedges have a singularly lifeless and deserted appearance. Finches and other seed-eating birds flock round farmsteads and stack-yards; while robins and hedge-sparrows draw close to houses, and are always to be found in the neighbourhood of pigstyes, wherever they exist—which, we may add, are also much frequented by blackbirds.

Sparrows appear to be capable of making a living under any circumstances; but even they during a long frost move into towns in considerable numbers. Rooks, again, become very hard pressed; if within reach of tidal waters, they pick up a living on the foreshores; but inland they are reduced to sore straits, and at such times may even be seen under oak-trees turning over the dead and fallen leaves with their beaks in search of the few remaining acorns; and, as every one knows who is in the habit of feeding birds in winter, they will come for their share of the scraps that are thrown out.

Of all our birds, however, the thrushes of different species probably suffer most, as hard frost, especially if accompanied by snow, completely closes the source of their supply of animal food. So long, indeed, as they have berries to fall back on they do well; but even in the most fruitful years—of which the last was certainly one

—the supply is soon exhausted, and then numbers die of sheer starvation. Curiously enough, red-wings, which only visit us as winter migrants, seem always first to feel the pinch, though all of the species eventually suffer alike. Fieldfares, when hard pressed, take to the turnip fields, and pick out the inside of the roots that have been attacked and opened up by rabbits; but the food does not appear to agree with them, as all that we have obtained under such circumstances have been little better than skin and bone, and numbers may be picked up dead.

There are, in our opinion, few more wretched objects in life than a half-starved thrush in time of frost. The unfortunate birds creep about under hedge-banks, and similar places, looking most forlorn, with all their feathers staring and ruffled —“hover,” as the country people call it—and with scarcely sufficient energy remaining to enable them to get out of the way of the passer-by; indeed, at such times many may be caught by hand. As before remarked, however, all birds suffer terribly in seasons of prolonged frost; and there are but few species indeed whose numbers are not thinned by the privations they endure. As a further instance of the dangers to which birds are liable, we may add that larks are sometimes overwhelmed by heavy snow, and are found dead on the ground after the thaw. Among the few birds that seem almost indifferent to the weather which is bringing death and desolation

to so many of their neighbours are the long-tailed tits, diminutive and tender-looking birds, yet sufficiently hardy withal; and one of the prettiest sights of winter is to see a family of these active little birds flitting from tree to tree, and spray to spray, in some wood or shrubbery, in their search for food, uttering the while their cheerful little call-notes.

Londoners, at such times as these, find the number of birds frequenting the parks and open spaces immensely increased, and included in the number are some which, in ordinary seasons, certainly cannot be ranked among the birds of London; for instance, throughout the present frost a few skylarks have used the Thames Embankment as a feeding-ground, while gulls do not visit town in large numbers except during hard weather. As an example of the increase in numbers, large flocks of starlings have frequented places where usually but a few are to be seen, rooks have entered the suburbs in considerable numbers, and blackbirds have penetrated much further into town than is their custom in open weather.

In conclusion, we would point out that a vast amount of bird-misery may be saved, and a corresponding amount of pleasure be gained, by any one, possessed even of a small garden, who will regularly, during time of frost, throw out scraps from the table as a meal for the starving birds. We say scraps advisedly, as many people feed their bird-pensioners on crumbs of bread alone, either

forgetting, or being ignorant of the fact that pieces of meat and other waste from the kitchen are good substitutes for the usual food of many birds which do not thrive on bread. Bones, and pieces of fat and suet, should be hung in the trees for the benefit of tits, and finally, a pan of water, renewed from time to time, will be found to be thoroughly appreciated.

BIRD-LIFE IN LONDON.

(June 3, 1893.)

THE rooks, after an absence of some years—how many we cannot really commit ourselves to say—have returned to Kensington Gardens, and established a flourishing little colony of some eleven nests in the trees on the west side of the Broad Walk, between the old Banqueting Hall and the Bayswater Road. We remember the time when Kensington Gardens could boast of at least three large rookeries; but in those days Kensington itself was little better than a village, and was surrounded on all sides, except to the east, by fields, orchards, and market-gardens. In those days—alas! long since passed—Kensington was a centre of the bird-catching industry, and a sort of small bird-fair was held in the season in the open space near the parish church.

The cuckoo, the nightingale, and the blackcap could always be heard in the spring-time upon Campden Hill, and “the Gardens” were as much frequented by birds as is Richmond Park at the present time. Gradually, however, the fields and open spaces were covered, Kensington was joined to Chelsea by streets instead of lanes, and Hammer-smith, Fulham, and Notting Dale became a wilder-

ness of houses. As the human population increased, so did the bird population decrease ; but the rooks, though in yearly diminishing numbers, held their own, as is their wont in towns, long after many other birds had retired, till at length, apparently disgusted with the somewhat ruthless felling of the trees in Kensington Gardens—which was carried out, no doubt, under high authority, but perhaps not altogether with knowledge—they, too, gave up the contest, and retired to Holland Park. Now, however, they have returned—we hope not to be disturbed again, but to build in increasing numbers for many years to come. Their return was heralded by one pair, which built successfully last year in the south-west corner of the Gardens, in one of the trees that once formed part of the fine avenue that shaded the old walk running at right-angles to the Palace.

It is curious that the bird population of London seems still to be undergoing a process of change, some species being largely on the increase, while others are decreasing in numbers, or have quite recently disappeared. The wood-pigeons afford the most noticeable example of increase in numbers, as they are now fully established, not only in the parks, but also in many of the squares which have trees suitable for them to build in, and they have extended their range well within the City boundary. They may always be seen in Palace Yard, Westminster, and for the fourth year in succession a pair are nesting in the elm tree over the fountain

at the end of Great George-street. This great and very noticeable increase has taken place within the last ten years, and had Mr. Seebohm been writing his "*History of British Birds*" in this year of grace 1893, instead of in 1884, he would not have had to go to Paris and Berlin for instances of the tameness of wood-pigeons in large cities. And here we may observe that these birds have not only enormously increased in numbers and tameness, but that they seem to be adopting town ways, quite foreign to the usual habits of the species, as we have frequently seen them on the roofs of houses, apparently as much at home as any of the dovecote pigeons; while, oddly enough, the latter, at all events in St. James's Park, have, contrary to their usual habit, taken to perching in trees.

Blackbirds and thrushes, though by no means so noticeable as the pigeons, are certainly on the increase in the Parks, owing, no doubt, in great measure to the fact that many inclosures planted with shrubs have been made of late years. They are far from uncommon; indeed, one morning not long since we saw no less than five cock blackbirds engaged in a tussle under the trees near the flower walk in Kensington Gardens.

Tits of two species—the great tit and the blue tit—have lately been largely on the increase in Kensington Gardens. And, lastly, though this is only an occasional—or, rather, seasonal—increase, we must mention the extraordinary visitation of gulls, mostly black-headed gulls, which now takes

place every winter. Whenever the weather is hard these birds come up the river literally in thousands, and they have become one of the winter sights of London. The simple fact that they do so is not astonishing in itself, but it is somewhat curious that they should, some five or six years ago, have suddenly adopted the habit, while before that time they were only represented by an occasional straggler.

The list of birds that have left town during even the last ten years—never, we fear, to return—is a somewhat large one, but we must content ourselves with mentioning the martins and flycatchers. The spotted flycatcher, not many years ago common in Kensington Gardens and the neighbourhood, seems now to have entirely deserted its former haunts, and the martins have gone with it. The cause of this disappearance is, we think, sufficiently clear, but is not usually, in our opinion, satisfactorily explained. So high an authority as Mr. Howard Saunders, for example, in his very valuable “Manual of British Birds,” gives it as his opinion that the martins were driven out of their former nesting-places in the West-end of London by sparrows; but though without doubt sparrows exist in London in countless thousands, and though equally without doubt they are the greatest possible enemies to nesting martins, as they ruthlessly dispossess them as soon as they have completed the outer walls of their nests, yet we cannot think that sparrows alone are to blame in

this case, and certainly they can have taken no part in ousting the flycatchers, yet the diminution in numbers and final extinction of the martins and flycatchers were practically simultaneous. It is a noteworthy fact that martins nested in the heart of London in Gilbert White's time, for he wrote: "They even affect the close air of London. And I have not only seen them nesting in the Borough, but even in the Strand and Fleet-street; but then it was obvious from the dinginess of their aspect that their feathers partook of the filth of that sooty atmosphere." Yet sparrows were, no doubt, relatively as numerous and quite as mischievous in the London of Gilbert White's time as they are in our own. After weighing all the evidence, we cannot help feeling that the case against the sparrow must be dismissed with the Scotch verdict "not proven." Wandering cats, no doubt, do enormous injury to birds in London, and may possibly have interfered with the fly-catchers, but they cannot have affected the martins. Our theory, the value of which we leave entomologists to decide, is that the extinction of the birds in question is caused by the state of the atmosphere, and the general change of condition due to altered surroundings which have destroyed much of the insect life on which they feed. The effect of the atmosphere is shown in the fact that rose culture, for which the district of Kensington was once famous, is now practically impossible even in the largest gardens, and, roughly speaking, it may be taken as true that in the

suburbs of London the zone in which roses flourish practically coincides with that in which the martins continue to breed.

We will only mention one other bird that is, we fear, fast verging on extinction in London, the hedge sparrow. From the nature of its food it has been able to hold out longer than either the fly-catcher or the martin, but we fear that its days are numbered. A few still linger in the Parks, but they are very few and far between. Until within the last year or two a pair always built in the private garden in front of Kensington Palace, but this year they are not to be seen.

Among the birds that have always been with us in town, and whose numbers are fairly stationary, may be mentioned starlings and jackdaws; the former have, we think, slightly increased in number, especially in St. James's Park, while the latter are, if anything, less common than they used to be.

Many birds visit London during their migrations. In early spring wheatears may be seen in Hyde Park, and after them come the great army of warblers—chiff-chaffs, willow-wrens, &c., the chiff-chaff, from its well-known note, being perhaps the most easily recognised; many of them stay to rest in Kensington Gardens, but they make but a short visit, soon moving on again to their chosen summer quarters. In the autumn and early winter woodcocks often drop in town, sometimes in most extraordinary places, the overhead wires

being in many cases, no doubt, accountable for their appearance. A winter or two ago we saw one which had been captured, apparently uninjured, in Kensington High-street. Unfortunately the captor was no naturalist, and imagined that, as his prisoner was a bird, it must necessarily feed on "bird-seed," and consequently its life in captivity was but a short one.

Among birds one would hardly expect to find nesting in town may be mentioned a pair of crows which have long made their home in Kensington Gardens. We have not seen their nest this year, but understand on the best authority that it exists. Still more extraordinary is the fact that a pair of magpies are nesting in Regent's Park. A bird—doubtless one of the pair in question—has been about town all the winter, and for some time could often be seen in one of the large inclosures in St. James's Park, where it appeared to be quite at home and at its ease. If it had ever been in captivity, it had certainly moulted after it regained its freedom, as its plumage had all the appearance of that of a wild bird. If, as is most likely, this is one of the nesting pair, it no doubt left town in search of a mate, and only returned as far as the Regent's Park, where, owing to the proximity of the Zoological Gardens, it found food abundant.

Before concluding these somewhat discursive remarks, we would draw attention to a mixed colony of birds which are, many of them, Londoners perforce—we refer to the waterfowl in the several

Parks, and notably to those on the ornamental water in St. James's Park. The so-called wild-ducks, though a sadly mongrel-looking lot, are excellent flyers, and are by no means chary of exhibiting their powers, thereby adding greatly to the pleasure of those who are fond of seeing birds on the wing, and by their flight recalling to the mind many a pleasant hour spent amid very different scenery in pursuit of their wild congeners. They live in a semi-domesticated state in all the Parks, free to come and go as suits their fancy, but, being Londoners by birth and education, are doubtless perfectly satisfied with their surroundings, and therefore seldom wander further than from one sheet of water to another. St. James's Park, however, can, in addition to the ducks which are common to all the Parks, boast of an interesting collection of water-fowl, worthy successors of the King's wild-fowl, mentioned by Willughby as existing there in his time. Among the most interesting of the ducks which form part of this collection, and have places in the list of British birds, we may mention common and ruddy sheld-ducks, shovellers, wigeon, pochards, red-crested pochards—of which there are a particularly beautiful pair—and tufted ducks, though these by no means exhaust the list of ducks, not to mention the geese and other fowl, which we do not propose to particularise. Though these birds are pinioned, and therefore Londoners against their wills, they seem to thrive exceedingly.

III.—APPENDIX.

PALLAS'S SAND-GROUSE.

(Sept. 8, 1888.)

THE present year will be famous among ornithologists as the year of the second great irruption of Pallas's Sand-grouse into Europe. These birds were unknown in the British Islands until the year 1859, when three were obtained—two in England, and one in Wales. From this time until 1863, the year of the first great irruption, no further specimens were observed; but in that year they visited this country in considerable numbers, extending their range as far west as the coast of Donegal. Unfortunately, as is too often the case with rare birds, the interest which they excited was fatal to them; and the main body, which arrived early in May, was practically exterminated by the end of June, though specimens were obtained until the early spring of 1864, by which time the whole of the unfortunate immigrants had been destroyed. From that date until the present year, though some few stragglers have

been from time to time observed, there has been no further westward movement of large bodies of these birds from their natural homes and breeding-places, the Steppes of Central Asia. Early in May reports reached this country that the sand-grouse were again, after a lapse of twenty-five years, appearing in large flocks in Central Europe, and by the latter end of that month the advanced guard had reached our shores, the main body arriving shortly afterwards, and spreading over the country, many hundreds having been observed.

The sand-grouse, possessing as it does affinities not only with the grouse, but also with the plovers and pigeons, is not a true grouse, but is placed by ornithologists in a separate order—"Pterocletes." It is a quaint and noticeable bird, whether seen on the wing or on the ground; in weight between ten and eleven ounces; in length about fifteen inches. Its plumage may be roughly described as buff, chestnut, and orange, streaked and spotted with black; the feathers of the tail tipped with white, with the exception of the centre pair, which are long and tapering, the ends, for about three inches, being filamentous; the wings are also long and tapering. Its legs, like those of the red grouse, are covered with feathers down to the toes, of which, like the plovers but unlike the grouse, it has but three. The feet are most peculiar, as the toes are united by a membrane as far as the claws, thus forming a little feather-

covered pad with three black claws. This curious construction, coupled with the shortness of its legs, renders the bird anything but an elegant walker.

As in the true grouse the flesh of the breast is of two colours, white near the bone and dark in the outer part. The sand-grouse is very strong on the wing, and its flight is very rapid, and much resembles that of the golden plover, but is noisy, and can be heard at a considerable distance. Not very much is known of its nesting; it lays three or four eggs, certainly not less than three. The young when hatched are covered with down, and are able to shift for themselves.

The sand-grouse have now been among us for four months, and, though we are grieved to observe from the reports that have appeared from time to time in the columns of our contemporaries that many of these rare and harmless birds have, as in 1863, fallen victims to what we can only characterise as the foolish love of slaughter possessed by self-termed "sportsmen" and "collectors of British birds," still, thanks to the fostering care of many landowners and their gamekeepers, and to the more intelligent interest that has been taken in them throughout the country, a considerable number have remained practically undisturbed. This being the case, it is perhaps extraordinary that we have no absolutely trustworthy reports of their having nested and bred. Mr. Howlett, of

Newmarket, well known as a careful observer, has stated that he has during the last month seen young sand-grouse, but a certain amount of doubt is thrown on the correctness of his observation by the number of young—seven—which he alleges to have accompanied one pair of old birds. The abnormal wet and cold of this summer, which, according to reports from all parts of the country, have been terribly destructive to young partridges, have without doubt been most unfavourable to the breeding of the sand-grouse. We hope nevertheless that native-bred birds may now be living among us.

Great difference of opinion exists as to whether the sand-grouse if unmolested will become a naturalised British bird. So great an authority as Mr. Tegetmeier apparently has no doubt on the subject; we, however, while admitting some slight want of confidence in the result, can only hope that this interesting problem may be satisfactorily solved. This can only happen, another immigration being for the present at least improbable, if the birds now among us are carefully preserved from destruction, and as much as possible from disturbance. We would therefore impress upon our readers the importance of doing all in their power to protect the sand-grouse during the shooting season which has just commenced, and we hope that all owners of shootings will, during this season at least, make a strict rule that under no circumstances

shall a sand-grouse be shot. Sportsmen should be as interested in the preservation of these curious birds as are ornithologists, for should their naturalisation become an accomplished fact, our list of game birds would receive a most welcome addition in Pallas's sand-grouse.

THE FARNE ISLANDS.

(Aug. 16, 1890.)

THE Farnes, or Fearnese, are a group of very small islands—one or two of them, indeed, being little more than rocks which are nearly covered at high water—lying off the north coast of Northumberland, about half-way between Bamburgh and the little fishing village of North Sunderland, and separated from the mainland by a channel about two miles wide. They are, perhaps, most generally known as the scene of the rescue of nine of the crew of the s.s. *Forfarshire* by Grace Darling and her father, the latter of whom was the keeper of the lighthouse on the outermost of the islands. Their fame, however, does not rest on this exploit alone; but rather, among ornithologists at least, on the fact that during the summer months—that is, from May to September—they are the home of countless sea-birds, which resort to them to nest and rear their young, a purpose for which they are eminently adapted, not only from their isolated position, but also from their conformation, as, though extremely small, they provide cliffs, stacks, and crags, rabbit-warren and land thickly covered with vegetation, rocks, and sloping beach, all of which are taken possession of for nesting purposes

by different species of birds. With the exception of two on which the lighthouses stand, and of a third on which two of the keepers live during the breeding season, they are without human inhabitants, and after the departure of the birds are given over entirely to a few rabbits, which must, we should imagine, find it hard to eke out a subsistence during the winter months in such extremely bleak and inclement quarters. It may be added that on the inner Farne, which is the largest of the group, there are two lighthouses, and also a curious little church dedicated to St. Cuthbert, and an old tower, formerly used as a lighthouse, and known as St. Cuthbert's Tower; and as this island has quite a considerable population—one at least of the lighthouse keepers at the present time having a wife and family—it is not frequented by the birds as the others are.

To any one who is a lover of birds there can be no greater treat than a visit to the Farne Islands during the breeding season; indeed, in our opinion they afford a sight which well repays the traveller even for the trouble of a ten hours' journey from London. The second week in June is the best time to visit them, as this is the height of the breeding season, and in addition to the eggs, which are practically countless, the visitor has the pleasure of seeing many newly-hatched birds. To reach the islands it is necessary to charter a coble. This, with its crew of three men, can be obtained at North Sunderland, which can boast of

as quaint a little harbour as can be found on the coast, and where lives the man, Cuthbertson by name, who knows probably more about the Farne Islands, and the birds which frequent them, than any one living. There are, of course, many days, even in June, on which the islands are not accessible, as, if there is any sea, it breaks with such violence on them as to make landing and embarking, even when possible, very unpleasant, if not absolutely dangerous. But given a fine day with a smooth sea, the trip is most enjoyable.

Looking across from the little harbour the islands appear quite close, though the nearest of them is distant about four miles; so close, indeed, that one cannot help wondering whether there really are birds upon them, as none are visible; but this apparent absence of birds applies to the whole of the coast between North Sunderland and Bamburgh, which, considering that there are thousands in such close proximity to it, is singularly devoid of bird life—a few gulls and terns, two or three pairs of eider ducks, and a pair or so of ringed plover, with one or two gannets, probably visitors from the Bass Rock, being all the birds often to be seen between the two places.

Very soon after leaving the harbour, however, birds begin to appear, first a pair of guillemots, then four or five together, then a puffin or two, and so on, as the islands are neared, until at length the water is covered with birds of different sorts which dive, swim, or fly off to make way for

the boat as it approaches, apparently more to avoid being run over than from any fear of its crew, and the air is full of parties flying in all directions, among which the puffins are particularly noticeable on account of their bright bills and orange legs, the latter of which they carry extended behind them as they fly. Then as "the Pinnacles"—flat-topped rocks divided from the cliffs of the nearest island by a very narrow channel, and rising forty or fifty feet perpendicularly from the sea—are approached, the guillemots are seen in all their glory as they occupy, literally in thousands, the flat tops, which, with a considerable part of the sides, are so completely whitewashed by their droppings as to give the rocks even at a considerable distance the appearance of being whitecapped. They sit on end in their own peculiarly prim fashion, packed so closely, that to all appearance there is not room for another; indeed, so dense are the masses, that one cannot help wondering how any individual bird can recognise its own egg, for the guillemot lays but one, or having left it, can force its way back to it again when it has recognised it, more especially as the eggs are placed on the bare rock without the faintest vestige of a nest. They are pear-shaped, very large for the size of the birds, and the colour and markings vary in different specimens in a most extraordinary manner, the former ranging through every shade, from a light slaty grey, or even white, to a bright blue. As the boat passes, hundreds of birds stream off the

rocks, but even then the masses appear but slightly loosened, as the greater number refuse to budge. The guillemots, however, are not the sole occupants of the Pinnacles, as nearly every shelf or projection in the perpendicular face of the rock is occupied by the nest of a kittiwake ; and, in our opinion, one of the most beautiful sights which the islands afford is that of these pretty little gulls as they fly circling round, clamouring loudly the while, when disturbed from their nests by the presence of the boat and its crew, the white and blue-grey of their plumage relieved by the black tips to their wings, and their greenish-yellow beaks contrasting well with the dark rocks which form the background of the picture. They are not, however, confined to the Pinnacles, but nest in the adjoining islands wherever there are perpendicular cliffs. Before taking leave of the guillemots and kittiwakes, we may remark that they can be approached, within a very few yards, from the top of the neighbouring cliff, on which, indeed, an odd guillemot's egg or two can be seen, laid, no doubt, by birds crowded out of the main body ; and from this position it is easy to look down into the well-built nests of the kittiwakes, and to see their spotted brown eggs or speckled downy young. The islands may be described as being generally steep and cliffy on one side, and sloping down to the water on the other. Most of them are rocky even on the low side ; but one or two have shingly beaches, the former being occupied by gulls, the

latter by terns; while the inhabitants of the interior of the islands vary with their formation. For example, as we land on one of the outer islands, which is rocky throughout, the higher part alone being covered with very scanty, coarse vegetation, with a tremendous clamour hundreds of gulls, mostly lesser black-backed gulls, but with a few herring gulls interspersed, start into the air, circling and screaming round the intruders; while from among the rocks in the highest part of the island seven or eight cormorants fly quietly off to sea, followed by one or two eider ducks. Walking about, it is hard to avoid treading on the gulls' eggs, which are placed in rather loosely-made nests among the coarse herbage or on the rocks themselves. As the centre of the island is reached it is easy to see the nests of the cormorants, which are large, slovenly constructions, composed principally of seaweed, mixed with pieces of drift-wood, corks off fishing-nets, and other such flotsam and jetsam, the whole covered and made filthy both to sight and smell by the droppings of the birds and remnants of fish. The eggs, which are bluish-green in ground colour, are covered with a white calcareous matter; but, except when freshly laid, look as dirty as the nests. Most of the cormorants, however, breed on a rocky islet called the Megstone, a little distance from the main group, of which the other birds leave them in undisturbed possession. In a comfortable hollow between two rocks we find the nest

of an eider duck, and then, within a very short distance, one or two more. These nests are most cosily lined with the brown down which the bird picks from her breast, from time to time, during the process of incubation, and in which the large greenish-grey eggs, from five to eight in number, are almost covered. The eider ducks seem quite aware that they are protected, and many of them, especially when sitting deep in the sea campion, with which most of the islands are covered, will permit a very near approach unmoved, sitting as quietly as any tame duck. While the ducks are thus engaged with family cares the drakes leave them, and may be seen swimming about near the islands, their handsome black and white nuptial plumage being extremely noticeable. On another and larger island, off which the Pinnacles lie, we are met on landing with the same clamour of seagulls, but the birds are noisier and bolder, one or two of them occasionally dashing down close to our heads in a threatening manner, screaming loudly the while—a sure sign that they have young ones—and with very little search the little down-covered creatures can be found, having, though very lately hatched, left their nests to hide among the herbage or under any piece of dry seaweed or other rubbish that may be near. The centre of the island is thickly overgrown with sea campion, and is white with blossom which fills the air with perfume; the soil is light and peaty, and is full of burrows, the possession of which is

divided between numberless puffins and a few rabbits. Many of the puffins, curious pompous-looking little fellows, with large, brightly coloured bills, may be seen sitting about on the rocks and flying and swimming round the island, while their partners are below the ground, sitting each on the solitary egg which she has laid at the end of the burrow. These birds sit most assiduously, so much so, that they can be taken off their eggs—a dangerous experiment, we may remark, for anyone who does not know how to handle them, as they not only bite fiercely, but scratch terribly with their sharp claws—and, when put down again, scramble back with ludicrous haste into their holes. On this island we find more eider ducks' nests—in fact, eider ducks, gulls, and puffins are found on nearly all the islands.

The terns, the most interesting of all the birds, have been left to the last; and at length we visit their islands, which, as we before remarked, have shelving beaches, and are covered over their centres with the universal sea campion. Here the terns are numberless, and the beach down to high-water mark is literally covered with their eggs; so much so that very great care has to be used in walking to avoid treading on them. They are also to be found in large numbers among the sea campion; many are laid on the shingle with little, if any, pretence of a nest; while others have slight nests made of bents and pieces of seaweed. The birds are of four species—common, arctic,

Sandwich, and roseate terns—the two latter being such rare birds that a sight of their nests and eggs alone is sufficient to repay the trouble of a visit to the Farnes. The first of the two, however, though rare elsewhere, are found here in large numbers, the colony being a famous one; while of the last there are only a few pairs. The sight of these graceful little birds—sea-swallows, as they are often called—as they rise in countless numbers when disturbed, is most beautiful, and it is interesting, as one moves along, to see them constantly rising in front of and settling down behind one, as, especially when they have young, they remain in the air but a very short time after the person disturbing them has passed. The eggs of the common and arctic terns are much alike, and are very similar in colour. They are generally of a buffish-grey, blotched and spotted with brown. The Sandwich terns usually lay two, and occasionally three, eggs of great beauty, which also are subject to very great variation in colour, some of them being nearly white, while in others the ground colour is a rich yellow, and every intermediate shade can be found, spotted, blotched, and streaked with brown of different shades. On these beaches, in addition to the terns, a few pairs of oyster-catchers breed, laying their eggs in curious nests, if so they can be called, formed of a small collection of shells; and here, also, may be found the stone-coloured eggs spotted with black, so difficult to see among the shingle, of that

prettiest of waders, the ringed plover—a little bird which always shows the greatest solicitude for its young when they are approached, endeavouring by every artifice in its power to draw away the intruder. With these little plovers, our list of birds breeding on the Farne Islands is closed; it consists of the twelve following species, which alone, so far as we are aware, breed there:—The cormorant, eider duck, ringed plover, oystercatcher, arctic tern, common tern, roseate tern, Sandwich tern, kittiwake, herring gull, lesser blacked-backed gull, guillemot, and puffin. Other birds, for example a few herons and gannets, may be seen, but they are only visitors.

The islands have from time immemorial been famous as a breeding-place of sea birds, and their very fame went far to ensure the entire destruction of the birds which caused it, as, the several Wild Birds Protection Acts passed since 1869 notwithstanding, the unfortunate birds were shot in thousands by self-styled “sportsmen,” and their nests were also persistently robbed, the fishermen and others taking eggs indiscriminately for sale as food, while the army of “egg collectors” was constantly raiding the nests of the rarer birds. The extent to which this robbery was carried on, even by scientific men, may be imagined when we find so well known an ornithologist as Mr. Seebohm confessing, in his “History of British Birds,” to having taken as many as 456 eggs in one day, of which no less than 149 were those

of the rare Sandwich tern. But, fortunately, in the year 1888, an association of gentlemen interested in ornithology was formed, and was enabled to obtain a lease of the islands; and since that time the birds and their eggs have been most efficiently preserved, egg-collecting being strictly prohibited except with the special leave of the proprietors, which, except in the case of the gulls' eggs mentioned hereafter, is practically never granted. As might be expected, much trouble was experienced in the early days of preservation; but a judicious mixture of firmness and kindness appears to have made the path of the Association smooth; firmness was shown by bringing actions against trespassers, kindness by taking the first eggs of the gulls and dividing them among the fishermen. The islands are carefully watched by four keepers, who live on them during the whole of the breeding season, and allow no one to land unless provided with a pass. These passes can be obtained on application to Mr. Cuthbertson, at Seahouses, North Sunderland, or to the landlady of the "Crew Arms Hotel" at Bamburgh; they are granted on the applicant paying a small fee and signing an undertaking not to take any eggs or in any way molest the birds, and generally to obey the rules of the Association if allowed to land on the islands. The result has been all that could be desired, as we understand that more birds are breeding on the islands this season than has been the case for many years.

THE PROTECTION OF WILD BIRDS.

(March 14, 1891.)

A SHORT Bill, which, should it become law, will be known as "The Wild Birds Protection Act, 1891," has been introduced into the House of Commons by Mr. A. E. Pease, member for York, one of the chief objects of which, as it was originally drawn, was to extend the protection of the law to eggs as well as to the parent birds. Much attention has been drawn to this Bill owing to the preposterous design of the "Naturalists' Publishing Company, of Birmingham," to undertake an "Oological expedition to the land of the Great Auk;" or, in other words, to despatch an "experienced oologist" to trespass in the Shetland Islands in search of birds' eggs, of which we were told, "if the season is a pretty fair one, a haul of at least 20,000 (including many beautiful and rare varieties) may be expected;" a design which, thanks to the efforts of Lord Lilford and Mr. Wilson Noble, who exposed it in the *Times*, has, perhaps luckily for the experienced oologist in question, been abandoned. That a suggestion such as this could be made in all seriousness, as was apparently the case, will no doubt satisfy many that Mr. Pease's Bill is

urgently needed. Yet, though we are entirely in sympathy with him in his endeavour to preserve our rarer and more harmless birds, we cannot help entertaining serious doubts whether the proposals embodied in his Bill would, if they had become law, have had the desired effect; for, like Lord Lilford, we "rather dread any legislative action in the matter of the protection of birds' eggs," and we were therefore pleased to see his announcement in the *Times* of Tuesday last that, owing to objections which have been raised to the form of his Bill, especially in regard to the protection of eggs, he had put it down for a later period of the session, and in the meantime intends to remodel it.

The law as it stands, though no doubt capable of great improvement, is a powerful weapon if properly used, and the fact that it is not sufficiently enforced can hardly be considered a good argument for its alteration. If, however, it is to be amended, we should prefer that the amendment should be in the direction of more stringent provisions for the protection of the parent birds, and that many birds which are now omitted from the schedule of specially protected species should be included in the new Act rather than, as Mr. Pease originally proposed, that protection should be given to all wild birds' eggs with the exception of those of some sixty or seventy species. For it is demonstrable that in the case of most birds, if the parents are protected, the species is in little danger of extinction. No doubt, however, many

of our rarer birds, and notably those that breed in cliffs, and other open situations, suffer terribly from the ravages of "collectors," a race with whom we have no sympathy, and many of whom, having more money than brains, are willing to give large prices for specimens of the eggs of "rare" birds if guaranteed to be "British." Indeed, it would be a matter for congratulation if a law could be devised which would reach the collectors, who, being receivers, are far worse than the actual thieves. Yet much of this destruction might be prevented under the law as it stands, as, indeed, is well exemplified in the case of the birds breeding on the Farne Islands, for, as the Lord Advocate pointed out in answer to a question put to him in the House, "oologists are not yet exempt from the general law of trespass," and landowners have the power of preventing birds'-nesting if they care to use it. Unfortunately, however, very many landowners, especially if they are game preservers, are the greatest offenders in the matter of bird destruction, and, by encouraging their gamekeepers to destroy all birds which they consider "vermin," have practically exterminated many of our native species, utterly regardless of the fact that all birds, whether included in the schedule or not, are, under the provisions of the existing "Wild Birds Protection Act," entitled to a close time from March 1 to August 1. To take only one example; the "owl," which is named in the schedule; no particular species is mentioned, and therefore it must be

concluded that all are intended; yet gamekeepers destroy owls ruthlessly during the close season without fear of prosecution. The truth of the matter is, that the law has, in most places, been allowed to become practically a dead-letter, owing, we imagine, to the fact that no one is appointed to see that its provisions are enforced, for as usual what is everybody's business is nobody's business, and this is further emphasised by the boldness with which the captures of rare birds during the close season are constantly reported. That close times can be enforced is proved by the fact that coarse fish, which in open waters at all events were until quite recently considered by the multitude fair game at any time, are now most efficiently protected.

As it is Mr. Pease's intention to remodel his Bill we do not propose to criticise the draft which is now before the public further than by saying that we are at a loss to understand by what principle of selection he decided on "the sixty or seventy kinds of eggs"—we quote from his letter to the *Times*—which he proposed "to abandon to the ravages of the birds'-nesting boy," as we have no doubt that if, as is his declared intention, he obtains "the best advice he can," his second schedule will be very materially altered when next his Bill is published. We hope, however, that among the authorities whose advice he proposes to take he does not number his Norfolk correspondent, who is responsible for the startling statement that in

looking round the London, Norwich, and Cambridge markets this winter he always saw, amongst other birds, hoopoes, nightjars, and sand grouse—killed, as he would lead us to believe, in this country—not to mention great bustards, which are also included in his list, for although, as is well known, there has been a considerable immigration of bustards this winter, they have certainly not been so plentiful as to find their way into the markets as ordinary articles of commerce.

In conclusion, we most heartily endorse Lord Lilford's opinion that if the egg question is to be dealt with, the most simple way of dealing with it would be to make the taking of all British birds' eggs, with about eight or nine exceptions, a penal offence, unless such taking was effected with the express permission of the owner or occupier of the lands upon which the nests were situated, and we commend this suggestion to Mr. Pease's most careful consideration.

FOURE-FOOTED BEASTES.

(Feb. 13, 1892.)

AMONGST the many quaint old books on natural history that have come down to us, there is none quainter than "The Historie of Foure-Footed Beastes, describing the true and lively figure of every Beast, with a discourse of their severall Names, Conditions, Kindes, Vertues (both naturall and medicinal), Countries of their breed, their love and hate to Mankinde, and the wonderfull worke of God in their Creation, Preservation, and Destruction. Necessary for all Divines and Students because the story of every Beast is amplified with Narrations out of Scriptures, Fathers, Phylosophers, Physitians and Poets: wherein are declared divers Hyeroglyphicks, Emblems, Epigrams, and other good Histories, collected out of all the volumes of Conradus Gesner and all other writers to this present day." By Edward Topsell. A book which is now by no means common, and is therefore not so generally known as it deserves to be. This Edward Topsell appears, from his own account, to have been, in 1607, when his book was published, "Chaplain in the Church of Saint Buttolphe Aldergate"; but a poor prefer-

ment, apparently, as he tells us that he had “not any accesse of maintenance, receiving no more but a labourers wages.” We are informed that his “endeavor and paines in this Booke was that he might profit and delight the Reader, where into he may looke on the holiest daies (not omitting prayer and the publicke service of God), and pass away the Sabbaoths in heavenly meditations upon earthly creatures,” and he succeeded so well in his endeavour that the reader must be hard to please who cannot find much to delight him in the curious *pot-pourri* of fact and fiction which the worthy divine collected together in his 760 folio pages. Of course, in the early days of the seventeenth century zoology had not been raised to the dignity of a science; in fact, it had advanced but little, if at all, since the days of Pliny, whom our author constantly quotes as an authority. And it may therefore, be easily imagined that fiction very largely preponderates over fact; but the result is quaint beyond measure. Topsell tells us that he followed “D. Gesner, a Protestant Physitian, as neer as he could,” and adds the odd remark, “A rare thing to finde any Religion in a Physitian, although Saint Luke, a physitian, were a writer of the Gospell.” He evidently expected that many of his tales would be received with incredulity; for in his epistle dedicatory he says:—“For the rude and vulgar sort (who being utterly ignorant of the operation of learning, do presently condemne al strange things which are not ingrave in the

palms of their own hands, or evident in their own herds and flockes) I care not. I may remember you of a Countrey tale of an old Masse-Priest in the daies of Henry the eight, who, reading in English after the translation of the Bible the miracle of the five loaves and two fishes, and when hee came to the verse that reckoneth the number of the ghests or eaters of the banquet hee paused a little, and at last said they were about five hundred. The clarke, that was a little wiser, whispered into the priests eares that it was five thousand, but the priest turned backe and replied with indignation, Hold your peace, sirrha, we shall never make them believe they were five hundred. Such priests, such people, such persons I shall draw upon my backe, and although I doe not challenge a power of not erring, yet because I speake of the power of God, that is unlimitable, I will be bold to averre that for truth in the Booke of Creatures (although first observed by Heathen men) which is not contrary to the booke of Scriptures."

So delightfully quaint is the whole book that it is impossible to open it without finding something amusing, and the good stories are so many in number that it is equally impossible to say of any of them that they are the best. Among the descriptions, however, the following is distinctly good, and will commend itself, we imagine, to all lovers of cats, and, further, it is an excellent example of the author's style;—"It is needlesse to spend any time about her loving nature to man,

how she flattereth by rubbing her skinne against ones Legges, how she whurleth with her voyce, having as many tunes as turnes, for she hath one voice to beg and to complain, another to testifie her delight and pleasure, another among hir own kind by flattering, by hissing, by puffing, by spitting, insomuch as some have thought that they have a peculiar intelligible language amongst themselves. Therefore how she beggeth, playeth, leapeth, looketh, catcheth, tosseth with her foote, riseth up to strings held over her head, sometimes creeping, sometimes lying on the back, playing with one foot, sometime on the bely, snatching now with the mouth and anon with the foot, apprehending greedily anything save the hand of man with divers such gestical actions it is needlesse to stand upon." As showing that our author was not ignorant of the habits of animals that came under his own observation, we may notice that he states that weasels "kill, eat, and do vour" moles, "because of their long slender bodies, they are apt to creep into the holes of the earth"; a fact which, if we may judge from correspondence which from time to time appears in the natural history columns of the *Field*, is not even yet as well known as it should be. The following *à propos* of moles, is too good to be omitted:—"When the wormes are followed by molds (for by digging and heaving they foreknow their owne perdition) they fly to the superficies and very toppe of the earth, the silly beast

knowing that the molde, their adversary, dare not followe them into the light, so that their wit in flying their enemy is greater then in turning againe when they are troade upon"; and finally we commend the follow prescription to those who are troubled by these mound-raising little animals:—"If you whet a mowing syth in a fielde or meddow upon the feast day of Christ's nativity (commonly called Christmas Day), all the molles that are within the hearing thereof will certainly for ever forsake that fielde, meddow, or garden," though in fairness we must add that Topsell considered this a "superstitious conceite."

It is not, however, when writing about familiar animals that the author of the "Historie" is at his best, but when he launches out into what, for want of a better term, we must call heroic natural history; for example, he knew all about, and described and figured among the apes, the Satyre, the beast called Pan, the Sphinga or Sphynx, and other wonderful creatures which are certainly not to be found in any modern list of Anthropeidea; but even these are but commonplace animals when compared with that "fearful and terrible beast" the Gorgon, one of the "manifold and divers sorts of beasts which are bred in Affricke," which he figures on the title-page, where it appears with cloven hoofs and a curly tail and covered with scales like a Pangolin. The following is its description:—"It hath high and thicke eie-lids, eies not very great, but much like an Oxes or

Bugils, but all fiery-bloudy, which neyther look e directly forwarde, nor yet upwards, but continuallye downe to the earth. From the crown of their head downe to their nose they have a long hanging mane, which maketh them to look fearefully. It eateth deadly and poysonfull hearbs, and if at any time he see a bull or other creature whereof he is afraid, he presently causeth his mane to stand upright, and being so lifted up, opening his lips, and gaping wide, sendeth forth of his throat a certaine sharpe and horrible breath, which infecteth and poysoneth the air above his head, so that all living creatures which draw in the breath of that aire are grievously afflicted thereby, loosing both voice and sight, they fall into leathall and deadly convulsions. It is bred in Hesperia and Lybia." The Lamia, of which we are given "the true picture," was another scaly beast, "of which, leaving fables we come to the true description"; this, we are told, is the beast called "Lilith" in the Hebrew, "in the foure and thirty chapter of Esay which is there threatened to possess Babell." Like the Gorgon, "this doth not onely kill by biting, but also by poysoning," afterwards "feeding upon the carcasse which he hath devoured . . . the hinder parts of this beaste are like unto a goate, his forelegs like a Beares, his upper parts to a woman, the body scaled all over like a dragon," and so he is represented in the cut. "The Ethiopian Eale," again, was distinctly "a strange beaste," for it had "the

cheekes of a Boare, the tayle of an Elephant," and, most marvellous of all, "hornes above a cubit long, which are moveable upon his head at his owne pleasure like eares; now standing one way and anone moving another way, as he needeth in fighting with other beastes, for they stand not stiffe but bend flexibly, and when he fighteth, he alway stretcheth out the one and holdeth in the other, of purpose, as it may seeme, that if one of them be blunted and broken, then hee may defend himselfe with the other." And, lastly, the Mantichora, said to be a species of hyæna, "bred among the Indians"—a sufficiently vague description of its habitat—"having a treble row of teeth beneath and above, whose greatnesse, roughnesse, and feete are like a lyons, his face and eares like unto a mans, his eies gray, and collour red, his taile like the taile of a scorpion of the earth, armed with a sting, casting forth sharp pointed quills, his voice like the voice of a small trumpet or pipe, being in course as swift as a Hart; his wildnes such as can never be tamed, and his appetite is especially to the flesh of man; with her taile she woundeth her hunters whether they come before her or behind her, and presently, when the quills are cast forth, new ones grow up in their roome, wherewithal she overcometh all the hunters"; altogether a pleasant type of animal, which it is satisfactory to think has disappeared from the earth, leaving no trace of its existence behind it. The examples we have given by no means exhaust

the list of fearsome beasts with which Topsell was acquainted, and did space permit we could tell of that "cruell, untamable, impatient, violent, ravening, and bloudy beaste," the Su, a native of Patagonia, and of many others, equally fierce and equally mythical; also of the Unicorn, whose horn as shown in its picture is palpably the tooth of a narwhal, and of other fabulous, but harmless, creatures; but our quotations are sufficient to show the extraordinary fables which in Topsell's days did duty for zoological facts. No doubt they were days of unlimited faith in the marvellous, but even then we imagine that the learned divine could hardly have been disappointed in his expectation of drawing many of the vulgar sort "upon his backe.

MEDICINES FROM ANIMALS.

(Sept. 17, 1892.)

THAT "divers medicines arise out of every part of every beast almost" was universally believed from the earliest times of which we have any record, until comparatively quite recently, so recently indeed, that Dr. Brookes, in his "History of Quadrupedes," speaks of their properties and uses in medicine, and he wrote late enough to quote "Mr. Buffon" and "Linnæus." This belief is now, however, except among the uneducated classes, nearly extinct, and happily so for those unfortunate enough to require medicine. Although, as has been pointed out by Mr. Hudson in his delightful book "The Naturalist in La Plata," some of the animal specifics used by the vulgar, and formerly laughed at by learned physicians, now have honourable places in the pharmacopœia—pepsine for example, of which he says, "The Gauchos were accustomed to take the lining of the rhea's stomach, dried and powdered, for ailments caused by impaired digestion . . . science has gone over to them, and the ostrich-hunter now makes a double profit, one from the feathers, and the other from the dried stomachs which he supplies to the

chemists of Buenos Ayres. Yet he was formerly told that to take the stomach of the ostrich to improve his digestion was as wild an idea as it would be to consume bird's feathers in order to fly." Dr. Brookes gave many curious prescriptions, but was careful not to give them on his own authority; for example, he says, "There are grave physicians who affirm, that if those who have a whitlow put their finger into the ear of a cat, it will certainly cure it." But the Rev. Edward Topsell, or rather his authority, Gesner, had no such scruples, and without doubt believed implicitly in all his marvellous remedies; for in "the first epistle of Conradus Gesnerus," in the "*Historie of Foure-footed Beastes*," we read, "The beastes do offer many profitable medicines for the cure of men; which the skilful Phitisian must borrow from them if he will be perfect in his art and conscionable in his profession. . . . And I have proved, by the inspection into this knowledge, that herein is layed the largest foundation of Medicine." Of course, in the sixteenth and early in the seventeenth centuries medical science, as now understood, was practically non-existent; and the authorities for the remedies to be found in the *Historie* range from Hippocrates downwards.

The following are a few of the recipes, taken almost at random, choice being only made of those prescribed for diseases and afflictions which are perhaps as common as any to which flesh is heir. To those who suffer from toothache—a complaint

which few escape—we commend the following simple remedies:—"The teeth which were first ingendered in a horse have this vertue in them, that if they should touch the teethe of a man or woman who are molested and grieved with the toothache, they shall presently find a finall ende of their paine: if in like manner a child doe kisse the nose or snowt of a horse he shal never feele paine in his teeth," "the tooth of a hare layed to that part where the teeth ake easeth them," or "if the liver of a Bull be boiled on a soft fire, and put into ones mouth that hath the tooth ache, the paine will goe away so soone as ever the teeth touch it." In cases of earache and deafness, "The fatte of a Dormouse, the fatte of a hen, and the marrow of an Oxe melted together, and being hot, infused into the Eares, doth very much profit both the paines and deafeness thereof." Gout was a common complaint in the days of Topsell, as is evidenced by the large number of prescriptions for the cure and "easing" of it that he has handed down to us.

The following, which form but a very small part of those given, are sufficiently quaint for repetition:—"The Oyle in which a Fox is baked either alive or dead, doth either altogether cure and make whole those which are troubled with the gout, if so be that the disease or sicknesse be greene or new, or at the least not of to longe continuance, it doeth so cure them, although it may happen to retorne againe yet it will be much more

milde and gentle then it had beene.” “A Fox sod in water till nothing of the Fox be left whole except the bones, and the Legges or other parts of a gouty body washed and daily bathed therein, it shall drive away all paine and grieve, strengthening the defective and weake members.” After this prescription, however, our author adds, “Nevertheless, such bodies are soone againe replenished through evill dyet, and relapsed into the same disease againe.” “A fat cat sod” is also prescribed, “first taking the fat, and annoynting therewith the sicke part, and then wetting Wooll or Towe in the same, and binding it to the offended place,” and “A Woulfe being sodden alive untill the bones doe only remaine, is very much commended for the paines of the gout,” though how the remedy is to be applied does not appear. “The dust of a living Weasell brent, mingled with wax and rose-water, and annointed with a Feather upon gouty legs,” we are told, “cureth the same disease”; but all the above prescriptions are simple in comparison with the following gruesome recipe:—“If ther shal be any flesh or bones of men found in the body of a dead Hyæna, being dried and beaten to powder, and then mixed with a certain perfume, they will bee very excellent to help the gout.” Topsell quaintly adds:—“The vanity of the Magi or Wise-men which is witty in nothing but in circumstance of words, doth say that the best time to take Hyænaes is when the Moone passeth over the signe called Gemini.”

“For giving great ease unto the gowt the skinnes of beavers burned with drie Oynions and liquid pitch put into the soles of shooes,” or soles made of “Badger skins,” are very much commended.

The prescriptions for the cure of coughs are almost as numerous as are those for gout, but three examples must suffice. “The liver of a fox washed in Wyne and dryed in an earthen pot in an Oven, and afterward seasoned with Sugar, is the best medicine in the world for an old cough, for it hath bin approved to cure it; although it hath continued twenty yeares, drinking every day two sponsfuls in Wine.” “The broath that is confected of goat’s fat sodden helpeth the cough being tempered with new sweet wine, that an ounce may be put in a goblet and so mixed with a branch of rue”; or “the fome of a horse being 3 or 4 times taken in drinke doth quite expell and drive away the cough. The same also being mingled with hot water, and given to one who is troubled with the cough, or consumption of the lungen, being in manner past al cure doth presently procure health.” Should any of our readers, however, think of trying this prescription, we advise them not to obtain the necessary “fome” from a horse that they value, as the death of the horse “doth instantly ensue” upon the cure of the patient. The approved medicine for the Squinancy, or quinsie, is compounded as follows:—“Take a live cony and burn her in an Earthen pot to poudre, then take a spoonful of that poudre in a draught of wine, and drink the

most part there of and rubbe your throat with the residue and it shal cure with speed and ease." In cases of colic we learn that "Tenne sprigs of Lawrell, seaven graines of Pepper, and of Opponax as big as Pease, the skin of the ribs of a Hedghog dried and beaten cast into three cups of Water and warmed, so being drunk of one that hath the Collicke and let rest, he shall be in perfect health; but, with this exception, that for a man it must bee the membrane of a male Hedgehog, and for a woman a female. The ashes, also, of a horses hoofe, being mingled with wine and water doth greatly ease and helpe the disease called the collicke."

Smallpox can hardly nowadays be reckoned as one of the common diseases, but the following recipe is too good to be passed over:—"The shaving of a Goates skinne, being rubbed with pumice stone, and mixed with Vinegar, is an excellent good remedy for the smal pox."

The medicines of animals were not only considered useful for the cure of actual disease, but were thought equally efficacious in minor complaints, such, for instance—to take two examples only—as nightmare and baldness, for both of which we find a large number of remedies suggested. For example, "One of the great teeth of an Hyæna being bound with a string unto any that are troubled in the night times with shadowes and fantasies, and which are frayed out of their sleepe with fearful visions, doth very speedily and

effectually procure them ease and rest," or "the right eye of a beare dried to poudre and hung about childrens neckes in a little bag driveth away the terrour of dreames." Both of these were, no doubt, more in the nature of charms than medicines, and could certainly do no harm if they did no good, which can hardly be said of the following prescriptions, which, if indigestion and nightmare represent cause and effect, would surely tend to increase the mischief they were said to cure:—"He which doth eate the skinne of a woulfe well tempered and sodden, will keepe him from all evill dreames, and cause him to take his rest quietlie," or "the flesh of a Lyon being eaten will very effectually worke him ease and quietnesse." "For those which are troubled with the casting and shedding of their hair there is an excellent remedy, which is this—to take mice which inhabite in houses, and to burn or dry them in a pot, and then beat them; and being so used, to mixe them with oyle of Lawrell, and to rubbe the haire which are like to fall or shed with garlick, and to put them altogether into a Frontlet or fore-head cloath, and daily to keepe the same medicine or plaister unto them, untill the haire do grow fast, and they be ridde of that disease." There is also another remedy for the same disease, which is this:—"To burne a mouse and beate him into poudre and then to mingle the same with hony and greace of a Beare, and so to annoint the head, and this is accounted for a very speedy and

effectual cure"; or, "if the woole of a hare be burned to ashes, and mingled with oyle of myrtles, Buls gall, Beaten alume, and so warmed and annointed uppon the heade, it stayeth the falling away of the haire." In cases of actual baldness, the "blood of a mole being killed, spread or annointed upon the head, wil very speedily renew and bring the haire againe"; or "the skinne of the hedgehog being rosted with the head and afterwards beate into powder, and if you add thereunto Beares-grease it will restore unto a bald man his head of haire againe, if the place be rubbed untill it be ready to bleed"; and, lastly, "If one make a small candle of paper and coves marrow, setting the same on fire under his browes or eyelids, which are balde without haire and often annoynting the place he shall have very decent and comely hair grow thereupon."

In conclusion, we can only say that if the terrible mixtures—prescribed in all good faith by Topsell—of which those given above are but a very small and random collection, were used by our ancestors, we can only marvel at their wonderful faith and hardihood.

“PHAROE’S MOUSE.”

(Dec. 24, 1892.)

THE animal called by the Old-World naturalists Pharoe’s mouse, Pharaoh’s rat, the rat of India, or ichneumon, is perhaps best known in these days by its Indian name mongoose. It was so intimately connected with the crocodile in the minds, and consequently in the books, of these writers, that, having recently written on crocodiles, we feel that our subject is hardly complete without some account of this animal and of the marvellous stories which surrounded it.

The ichneumon, or mongoose, is a terrible enemy to “mice and rats, and such small deer,” a fact which was emphasised by Belon in his “Portraits d’Oyseaux,” &c., in the following quatrain, under the woodcut of this animal:

Voy le portrait du Rat de Pharaon,
Qui chasse aux Rats, comme fait la Belette;
Au demeurant fort cauteleuse beste,
Qui autrement est nommée Ichneumon.

But it is not so much in this capacity as in that of a destroyer of snakes and other reptiles that it has always been and is to this day famous. Everyone has heard and read histories of fights

between mungooses and cobras, and stories of how, when struck by the snakes, the animals run off into the jungle, and eat some plant or root which acts immediately as an antidote to the poison, and enables them to return and renew the fight none the worse for their wounds. And many long and learned disquisitions have been written on the same subject, and different plants named as affording the antidote. Yet all these stories are without foundation, the truth being that the mungoose is victorious owing to his wonderful agility and watchfulness, or, as Belon has it, to the fact that he is "*fort cauteleuse beste*"; and if he is unfortunate enough to be bitten he dies as certainly and as quickly as any other mammal.

And in this the ancient writers were far nearer to the truth than many of the moderns, for they ascribed the victory of the ichneumon over the "*Aspis*" to his cunning. The story as related by Aristotle, and repeated by Pliny, runs as follows in the words of the learned Philemon Holland:—"There is mortall war between the *Aspides* and the *Ichneumones*, or Rats of India. A beast this is well knowne to the *Aspis*, in this regard especially, that it is bred likewise in the same *Ægypt*. The manner of this *Ichneumon* is, to wallow oft times within the mud, and then to dry it selfe against the Sun: and when he hath thus armed himself as it were with many coats hardened in this manner, he goeth forth to combat with the

Aspis. In fight he sets up his taile, and whips about turning his taile to the enemie, and therein latcheth and receiveth all the strokes of the Aspis, and taketh no harm thereby: and so long he maintaineth a defensive battell, untill he espy a time, turning his head a to-side, that he may catch the Aspis by the throat, and throtle it."

Topsell mentions this story, but adds that, in his opinion, "this combate is better expressed by Oppianus. For, saith he, the Ichneumon covereth her body in the sande as it were in a grave, leaving nothing uncovered but her long serpentine taile, and hir eyes, and so expecteth her enemy. When the Aspe espyeth her threatening rage, presently turning about her taile, provoketh the Ichneumon to combate, and with an open mouth and lofty head doth enter the list, to her owne perdition. For the Ichneumon being nothing afraid of this great bravado, receiveth the encounter, and taking the head of the Aspe in his mouth, biteth that off, to prevent the casting out of her poison: afterwards tearing her whole body in [pieces, although gathered together wound in a circle, for the successe of these two combatants, lyeth in the first blow. If the Aspe first bite the Ichneumon, then doth her poison destroy her adversary; and so on the contrary, if the Ichneumon first bite the Aspe, then is the Ichneumon conqueror, and so for this cause she covereth her body as aforesaid."

This author further tells us that if an ichneu-

mon chances to find an "Aspe" by the water-side, "it ketcheth hold on the taile, and so draweth the beast into the Water, and receiveth help from the fluds to devour her enemy." It will be observed that in neither of these stories is there any suggestion of any vegetable antidote to the snake's poison, but that victory waits on the most active and cunning of the combatants. The story of the mongoose and its antidote is generally ascribed to the natives of India; but it is noticeable that Sir Emerson Tennent mentioned it as being of European origin, and said that the natives of Ceylon attached no credit to it. The ichneumon was also supposed to sometimes encase itself in its armour of sun-dried mud before attacking the crocodile in the manner described in our recent article—a story which apparently sorely exercised Topsell's mind, as, after describing the animal as "sitting close upon the liver of the Crocodile, and feeding full sweetly upon his intrals," he expatiates upon it as follows: "I wonder for what cause the beast should rowle her selfe in sand and durt, to enter into the Crocodiles belly: For first of all, if after her roling in the durt, she dry her selfe in the sunne, yet will not that hard crust be any sufficient armour of prooffe to defend her small body from the violence of the Crocodiles teeth, and besides, it encreaseth the quantity of her body, making her more unfit to slide downe through the Crocodiles narrow throate; and therefore the Authors

cannot be but deceived in ascribing this quality to her when she is to enter into the Crocodile but rather I beleeve, she useth this defence against the Aspe, and therefore the Author seeing her so covered with mudde might easily be mistaken in her purpose. For it is true indeed that when she seeth the Aspe upon the land she calleth her fellowes who arme themselves as beforesaid before the combat, by which meanes they are safely preserved, from the bitings of their enemies; or if it be true that they wallow themselves in the mudde, they do not dry themselves in the sunne, but while their bodies are moist, slide downe more easily into the Crocodiles belly.”

Notwithstanding their belief in these wonderful stories, which, however, if we except the crocodile story, are not much more incredible than some of those which pass current at the present time—for example, the fable of the vegetable antidote mentioned above—the old writers knew a good deal about the Egyptian ichneumon, at all events, and were perfectly aware of its value as a vermin-killer. Topsell tells us that “it eateth indifferently every living thing, as Snales, Lizards, camelions, all kinds of Serpents, Frogs, mice, and Aspes,” and that it “loveth all manner of foules,” and he was quite aware of its propensity for destroying the eggs and young of the crocodile, “whereby,” he adds, “the merciful providence of God doth notably appeare,

for the safeguard of mankind, which in those countries where these noisome beasts are bred, hath provided such an enemy to destroy them, both eggs and birds, as is friendly and tameable by the hand and wit of man.”

This reference to the tameableness of the animal is perfectly correct; indeed, mongooses are—as they have doubtless been from time immemorial—often kept in a semi-domesticated state to clear houses of vermin, such as snakes, rats, and mice, and a tame mongoose is as fascinating, but withal as bloodthirsty, a pet as can well be desired, and we should not advise any one who takes an interest in his poultry-yard to attempt to keep one. Bennett, in his “Tower Menagerie,” gave the following instance of the rat-killing power of the mongoose:—“The individual now in the Tower actually on one occasion killed no fewer than a dozen full-grown rats, which were loosed to it in a room sixteen feet square, in less than a minute and a half.”

The mongooses, or ichneumons, belong to the family *Viverridæ*, which also includes the *Cryptoprocta*, the *Genets*, and the *Suricate*, specimens of all of which can be seen in the “Small Cats’ House” at the Zoo. There are a large number of species, the best known being the Egyptian ichneumon (*Herpestes ichneumon*), the Pharoe’s mouse of the ancients, about which the wonderful stories were told, and the grey or Indian ichneumon (*H. griseus*), the best known of all.

They are widely distributed, being found throughout Africa, Southern Asia, and the Indo-Malayan Archipelago, the Egyptian ichneumon being also found in Spain.

Some years since mungoses were introduced into Jamaica for the purpose of destroying rats, which infested the sugar plantations; and they have since, in company with stoats, weasels, and other "vermin" been turned down in Australia and New Zealand in the hope that they would destroy the rabbits, which have become such a terrible plague; but we doubt whether, in the latter case at least, the remedy will not prove worse than the disease. There are at the Zoo at the present time, in addition to specimens of the Egyptian and Indian ichneumons, a white-tailed ichneumon (*H. albicaudatus*) from British East Africa, and a Puisa ichneumon (*Bdeogale puisa*) also from East Africa, the latter being "new to the collection," and, as will be seen, belonging to a different genus to the others, from which it differs in having only four toes on each foot. It is a curious little brown animal, by no means beautiful, and possesses a bushy tail, which oddly reminds one of a bottle-brush. "And thus much for the description of the Ichneumon."

MEDIÆVAL LORE.

(March 4, 1893.)

IN a little book lately published by Mr. Robert Steele (Elliot Stock) under the title that we have chosen for the heading of this article he introduces us to the work of a man famous in his day, but now practically forgotten, for which the thanks of all who are interested in the literature of the Middle Ages are due to him; and be it added, with all deference to Mr. William Morris, who is responsible for the preface that this body does not, as he fondly imagines, consist only of "those who are pledged to the forward movement in modern life." The book in question consists of extracts from Berthelet's edition of the English translation of the great work in nineteen books of Bartholomew Anglicus, "De Proprietatibus rerum," with short dissertations by the editor. This Bartholomew was a Franciscan friar, and doubtless an Englishman. The date of his book is not known with any certainty, but Mr. Steele in his introductory chapter gives excellent reasons for concluding that it was written about the year 1260. Originally written in Latin, it was translated into most of the European languages, English among

the number, the edition from which "*Mediæval Lore*" is compiled bearing date 1535. It was no doubt immensely popular, but perhaps had hardly so great an effect on the general literature of the sixteenth century, at least directly, as Mr. Steele would have us believe. Indeed Gesner, in his "*History of Animals*," treats it with scant courtesy, and apparently thought but little of the author's Latin and less of his facts, though he himself was sufficiently credulous.

Like all the writers of what may be called the pre-scientific age, Bartholomew Anglicus drew largely on Pliny for his natural history, and we accordingly find an account of all the wonderful beings described by that author, men "that be all headless and noseless, and their eyen be in their shouldrs, and some have plain faces without nostrils, and the nether lips of them stretch so, that they hele therewith their faces when they be in the heat of the sun," and so on, and so on, through all the wonderful descriptions known to readers of Pliny, or of the "*Voyage and travayle of Sir John Maundeville, Knight*."

Of our author's stories of animals, among the best, perhaps, is that which treats of the "everlasting fighting" between elephants and dragons, the end of the fight being as follows:—"The dragon leapeth upon the elephant, and busieth him to bite him between the nostrils, and assaileth the elephant's eyen, and maketh him blind sometime, and leapeth upon him sometime behind, and

biteth him and sucketh his blood. And at last after long fighting the elephant waxeth feeble for great blindness, insomuch that he falleth upon the dragon and slayeth in his dying the dragon that him slayeth." Mr. Steele says, perhaps with justice, that Du Bartas "wrote page after page of rhyme all but versified direct from Bartholomew," and, as Du Bartas is nowadays but little more read than Bartholomew himself, it may not be uninteresting to give his version of this part of the story as told by his translator, "Silver-tongued Sylvester," which is as follows:—

While th' Elephant (but to no purpose) strives
With's winding Trunk t'undoo his wounding gyves
His furious fo thrusts, in his nose, his nose;
Then head and all: and thear-withall doth close
His breathing passage: but his victory
Hee joyes not long; for his huge Enemy,
Falling down dead doth with his waightly Fall
Crush him to death, that caused his death, withall.

To return to Bartholomew. "The cause why the dragon desireth his blood is coldness of the elephant's blood by which the dragon desireth to cool himself. Jerome saith, that the dragon is a full thirsty beast; insomuch that unneth he may have water enough to quench his great thirst; and openeth his mouth therefore against the wind, to quench the burning of his thirst in that wise. Therefore when he seeth ships sail in the sea in great wind, he flieth against the sail to take their cold wind, and overthroweth the ship sometimes for greatness of body and

strong rese against the sail. And when the shipmen see the dragon come nigh, and know his coming by the water that swelleth ayenge him, they strike the sail anon, and scape in that wise." So much for the natural history. The book embraced the whole of human knowledge as it existed in the thirteenth century, including "science," medicine, and geography, and Mr. Steele's extracts under these several headings are distinctly well chosen. The following passages will give an idea of mediæval science as expounded by our author:—"Quicksilver and brimstone is the element, that is to wit matter, of which all melting metal is made. Quicksilver is matter of all metal, and therefore in respect of them a simple element." "Iron is gendered of quicksilver thick and not clean, full of earthy holes, and of brimstone, great and boisterous and not pure. In composition of iron is more of the foresaid brimstone than of quicksilver, and so for mastery of cold and dry and of earthy matter, iron is dry and cold and full well hard, and is compact together in its parts." After this description of the metal, Bartholomew gives us the following delightfully quaint dissertation on its uses:—"Use of iron is more needfull to men in many things than use of gold; though covetous men love more gold than iron. Without iron the commonalty be not sure against enemies. Without dread of iron the common right is not governed; with iron innocent men are defended; and fool-

hardness of wicked men is chastised with dread of iron. And well-nigh no handiwork is wrought without iron; no field is eared without iron, neither tilling craft used, nor building builded without iron. And therefore Isidore saith that iron hath its name *ferrum*, for that thereby *farra* that is corn and seed, is tilled and sown. For without iron bread is not won of the earth, nor bread is not departed when it is ready without iron convenably to man's use."

The chapters on medicine, though extremely interesting, are by no means so full or so curious as those of many of the later writers—Topsell, for instance—and Mr. Steele has contented himself with but very few examples. The following will commend itself to many:—"The liver is a noble and precious member, by whose alteration the body is altered"; but it may not be so well known that "by the spleen we are moved to laugh, by the gall we are wroth, by the heart we are wise, by the brain we feel, by the liver we love." The geography, as may be imagined, is a curious medley of fact and the wildest fiction. The descriptions of countries which were evidently known to the author, such as England, Scotland, France, and the Low Countries, are eminently free from fable, but no story was too wonderful for him when told of countries and peoples beyond his ken. His description of England as a "strong land and a sturdy," is, fortunately, true to this day, and this country is still in a sense "the plenteousest

corner of the world"; but unfortunately it cannot now be said—at all events in the author's sense—to be "so rich, a land that unneth it needeth help of any land, and every other land needeth help of England"; nor perhaps would it be strictly true to say of the England of our day that it is "full of mirth and of game, and men oft times able to mirth and game, free men of heart and with tongue, but the hand is more better and more free than the tongue."

In our opinion, the most amusing part of the whole book is Chapter iv., on "Mediæval Manners." The worthy friar was evidently a keen observer, and who shall say that he knew nothing of the ways of children when, in the chapter "Of a Child," we find the following:—"They dread no perils more than beating with a rod; and they love an apple more than gold . . . and make more sorrow and woe, and weep more for the loss of an apple than for the loss of their heritage. . . . They desire all that they see, and pray and ask with voice and with hand . . . they keep no counsel, but they tell all that they hear or see. Suddenly they laugh, and suddenly they weep. Always they cry, jangle, and jape; that unneth they be still while they sleep. When they be washed of filth, anon they defile themselves again. When their mother washeth and combeth them, they kick and sprawl, and put with feet and with hands, and withstand with all their might." In the chapter

“Of a Man” we find an amusing account of courtship and marriage. The description of courtship, allowing for change of manners, is as true now as when it was written; for example, “The spouse thinketh to win love of her he wooeth with gifts, and certifieth his will with letters and messengers and with divers presents . . . and to please her he putteth himself to divers plays and games among gatherings of men, and useth oft deeds of arms, of might and of mastery. And maketh him gay and seemly in divers clothing and array. And all that he is prayed to give and do for her love, he giveth and doth anon with all his might. And denieth no petition that is made in her name and for her love.” But in these degenerate days the bridegroom no longer “maketh revels and feasts and spousals, and giveth good gifts to friends and guests, and comforteth his guests with songs and pipes and other minstrelly of music”; indeed, manners and customs have so changed that the “friends and guests” are now expected to supply the “good gifts.” After his account of courtship and marriage, the good friar gives us his ideas of the married state, and though his description of a bad wife is perhaps curiously worded according to our modern ideas, there is no doubt that his judgment was a sound one, for he says:—“No man hath more wealth than he that hath a good woman to his wife, and no man hath more woe than he that hath an evil wife, crying and jangling, chiding and

scolding, drunken, lecherous, and unsteadfast, and contrary to him, costly, stout and gay, envious, noyfull, leaping over lands, much suspicious, and wrathful."

The chapter on "Mediæval Manners" in Mr. Steele's book ends with an account of "dinner and feasting," which, as he tells us, is much abridged, but is unfortunately, even in this form too long for quotation, and we can only give one short extract, which shows how completely manners have changed in the course of centuries. The author says of the household servants while waiting at table that "they busily help each other to do everything diligently, and talk merrily together." The extracts which we have given are taken practically at random, but give a fair idea of the contents of the book, which we heartily commend to all who are interested in the old-world manners, customs, and ideas.

ANCIENT AFRICANA.

(April 1, 1893.)

AFRICA attracts so much attention at the present time, and our knowledge of the great Continent increases so rapidly, that in a very few years the blank spaces found in maps even twenty or thirty years old will all have been filled in, and the mystery which has during the ages shrouded the land will be a thing of the past. Under these circumstances it may not be uninteresting to ascertain the state of knowledge when James I. was king—that is, about a century and a quarter after the famous voyage of Vasco de Gama, who is generally accredited with being the first European to have rounded the Cape of Good Hope, though in truth Bartholomew Diaz had before his time sailed at least as far as Algoa Bay.

It may readily be imagined that in 1626 nothing very definite was known of the interior of the country, and it is, therefore, at first sight a little surprising to find the whole of it shown, apparently in great detail, in a map published by that worthy tailor and author, John Speed, which he had “newly done into English,” no doubt from a Portuguese source, in the year above mentioned.

But a close inspection convinces us that the cartographer, while possessed of very little knowledge, was favoured with a lively imagination; for mountain-ranges and rivers meander over the surface of the country, the latter tunnelling under the former in all directions in a manner suggestive of ornament rather than of geographical exactitude. And, as is usual in old maps, names are repeated and inconvenient blank spaces are filled either with figures of animals or with such inconsequent notes as—"In the Hill Amara the sons of the Emperor of Æthiopia are held in ward and kept by a garrison"; or, "Here is gold digged up in great quantity." The Nile, we may observe, is shown as rising in two large lakes—Zaire and Zaflan—in 10° S.; the Congo, or Zaire, river also rises in Lake Zaire, as do some six or seven other rivers to the south of it, through another lake, Aquilunda. However, we will leave the map and turn to Speed's "description of Africa." He tells us in his prefatory remarks that, "give the people their own asking, and they will have the glory of the first inhabitants of the world and prove it too both from the temperature of their Ayre, and fertilitie of their Soyle, which breeds and nourisheth not onely Plants and fruits, but sends forth of its owne vertue living creatures in such sort as amaseth the beholder. We have a report (if you will beleeve it) that in a ground neere the River Nilus there have bene found mice halfe made up, and nature taken in the very nicke, when shee

hath already wrought life in the fore-parts, head and brest, the hinder joynts yet remaining in the forme of earth. Thus I suppose they wo^d have man at first growne out of their soyle without the immediate hand of God in his creation . . . and it hath bene the opinion of some vaine Philosophers . . . that there the sunne by his propinquitie wrought soonest upon the moisture of the ground and made it fit for mortalitie to sprout in." With regard to the stories of "monstrous people without heads, with their eyes and mouthes in their breasts," he was of opinion that though "maintained to this day by some Authors of good esteeme," they were but idle fables invented by those who told them, "either out of their owne error, or else a desire of glory more then they had deserved; or perhaps a Travailors tricke to cheat the ignorant world that could not confute their reports." However, he apparently believed all the wonderful tales extant in his time of ravening beasts and other horrible monsters, for he tells us that beside other "annoyances," the country was "so full of a venomous kind of Serpent that in some places they dare not dresse their Land, unlesse they first fence their leggs with bootes against the sting. Other wild creatures there are which range about, and preserve to themselves a great portion of this Country, and make a wilderness of Lyons, Leopards, Elephants, and in some places Crocodiles, Hyænas, Basilisks, and, indeed, monsters without number or name." After this

account of the ravening beasts our author moralises as follows:—"But among all these inconveniences, commodities are found of good worth: and the very evils yeeld at last their benefit to their owne Country and other parts of the world. The Elephant, a docible creature and exceeding usefull for battle. The Camell, which affords much riches to the Arabian. The Barbarie horse, which we our selves commend. The Ramme, that besids his flesh gives twentie pounds of wool from his very tayle. The Bull, painefull, and able to doe best service in their tillage. And so most of their worst, alive or dead, yeeld us their medicinall parts, which the world could not well want."

Speed divided Africa into "seaven" parts—(1) Barbarie or Mauritania; (2) Numidia; (3) Lybia or Africa propria; (4) Nigritarum terra; (5) Æthiopia superior; (6) Æthiopia inferior; and (7) Ægypt. Of the first and last of these divisions he has little to say worth repeating here. Numidia, he tells us, was peopled by "Idolaters, Idiots, Theeves, Murderers, except some few Arabians that are mingled among them of ingenuous disposition, and addicted much to poetry." Lybia was called "Sacra as much as a Desert. For so it is, and a dry one too, such as can afford no water to a travailor sometimes in seaven dayes journey."

Terra Nigritarum, the land of negroes, "hath the name either from the colour of the people which are blacke, or from the River Niger, famous as Nilus almost for her overflowing . . . it is full

of gold and silver and other commodities." The inhabitants, we learn, "lived not as if reason guided their actions," and are said to "have entertained all Religions that came in their way. First their owne, then the Jewes, the Mahumetans, and some of them the Christian," indeed we are not surprised to learn that it was considered "a poore Country, God wot, not worth either Gentrie or Lawes, or indeed the name of a Kingdom."

Æthiopia superior, "likewise called the Kingdome of the Abissines," was the land of Presbyter John—"one of the mightiest Emperours in the World"—who drew his line from Saloman and the Queene of the South.

Speed has little else to tell us of this division, except that in one Province there was a law that "no man marrie till he have killed twelve Christians," after which statement it is not astonishing to find that the inhabitants were "base and idle," and that their religion was "mixt."

Lastly, Æthiopia inferior comprised the whole of South Africa. "On every side begirt with Sea except toward the North," this was divided into five "kingdomes." Aina, of which our author has nothing to say, except that it abounds "with Flesh, Hony, Wax, Gold, Ivorie, Corne, very large Sheepe."

Zanguebar, in which "stands Mesambique, called by Ptolmie Prassum Promontorium, and was the utmost part Southward of the old world." Mono-

molopa—spelt Monomotapa in the map—which embraced the whole of the territory now known as Mashonaland. As is pointed out by Mr. Bent in his “Ruined Cities of Mashonaland,” it was so named by the early Portuguese explorers after Monomatapa, the dynastic name of the paramount chief. In this country, we are told, there were “reported to be three thousand mines of gold,” and we find Zimbaos—the present Zimbabwe—duly marked on the map; but Speed, doubtless from want of space, does not give us any of the wonderful stories of the wealth of the Emperor extant among the early Portuguese travellers, contenting himself with the remark that “their King is served in great pompe, and hath a guard of two hundred mastives.”

Cafraria seems to have been practically unknown, as our author has literally nothing to say of it, except that its people lived “in the Woods without Lawes like brutes,” and that “here stands the Cape of good Hope,” about which, he adds, the sea is always rough and dangerous. “It hath beene especially so for the Spaniard. It is their owne note, in somuch, that one was very angry with God, that he suffered the English Heretickes to pass it so easily over, and not to give his good Catholikes the like speed.”

And, finally, Manicongo, whose inhabitants are very vaguely said to be in some part Christian, but in “other by-Provinces Anthropophagi, and have shambles of mans flesh, as we have for meate.” They can hardly have been pleasant neighbours

even for Africans, as they are said to have killed their "owne children in the birth, to avoide the trouble of breeding them," and to have "preserved their Nation with stolen brats from their neighbouring Countries."

This being, in Speed's words, "as farre as we may travaile by Land," as we do not propose to "loose out into the bordring Seas" with him, we must bid him farewell, only observing in conclusion that, notwithstanding his great show of knowledge, his information appears to have been of the very scantiest description.

CROCODILE-BIRDS.

(May 6, 1893.)

THE current number of the *Ibis* contains an extremely interesting communication by Mr. J. M. Cook on the subject of the Old World story of the bird which is said to attend on the crocodile, and to enter its mouth for the purpose of either picking its teeth or removing the leeches from its mouth. The latter is the older version, and was told by Herodotus as follows:—"All other birds and beasts avoid him [the crocodile]; but he is at peace with the Trochilos because he receives benefit from that bird. For when the crocodile gets out of the water on land and then opens its jaws, which it does commonly towards the west, the Trochilos enters its mouth and swallows the leeches; the crocodile is so well pleased with this service that it never hurts the Trochilos." Numberless authors have repeated the story—which was amplified and oddly distorted by Pliny and the mediæval authors who followed him—but among modern ornithologists, at all events, it has received but little credence, though it is mentioned by many of them. Their position in the matter is

well exemplified by Gould in his "Birds of Asia," where, though in the background of his plate representing the Egyptian plover (*Pluvianus Ægyptius*) he shows two of these birds entering the mouth of a crocodile, and in his letterpress he discusses the question whether this bird or the spur-winged plover (*Hoplopterus spinosus*) is the Trochilos of Herodotus, he tells us that he only inserted the figure of the crocodile to illustrate an oft-told tale, and that the point as to which bird was intended is of little moment, since in all probability the story is not founded on truth.

Mr. Cook has, however, thrown new light on the question, and has supplied us with direct evidence that a bird, which he identifies as the spur-winged plover, does enter the crocodile's mouth. It appears that in the year 1876 he noticed some crocodiles and several of the birds "which are called by all the natives of the Nile Valley crocodile-birds," on a very large sand-bank near Derr (the capital of Lower Nubia), and with his brother-in-law, the late Mr. J. E. Hedges, determined to watch them. The following is his account, in a somewhat condensed form, of what happened:—"For this purpose, during the dark hours, we had a small pit dug on the western side of the large sand-bank in question, and about the peep of day the following morning we ensconced ourselves in the pit. . . We watched patiently until about noon, when two large crocodiles came out of the water on to the bank, and apparently

were soon asleep. Several crocodile-birds commenced flitting over them, and through our field-glasses we watched one bird and saw it deliberately go up to a crocodile, apparently asleep, which opened its jaws. The bird hopped in and the crocodile closed its jaws. In what appeared to be a very short time, probably not more than a minute or two, the crocodile opened its jaws, and we saw the crocodile-bird go down to the water's edge. As the sandbank was, I should say, at least half a mile across, and the bird's back was turned towards us, we could not see whether it vomited in the water or drank; but in the course of a few seconds it returned to the crocodile, which opened its mouth again, and the bird again entered. The mouth was closed, and in a short time was opened again for the bird to come out, and the same operation was repeated at the river-bank. We saw the same bird enter the crocodile's mouth three times, and on three occasions run to the water to either vomit or drink." Eventually Mr. Cook shot two of the birds, which, as we have said, he has since identified as the spur-winged plover. In conclusion, he tells us that "he never knew that the fact of the crocodile-bird entering the crocodile's mouth was seriously doubted" until a conversation which he had recently with Dr. Sclater and Mr. Seebohm.

To this account the editor of the *Ibis* adds a note, in which he says that "the story is universally believed on the Nile, but, so far as we know, is

not confirmed by an eye-witness since the days of Herodotus, Aristotle, and Ælian.” No doubt, until Mr. Cook made his observation, the story had not “been confirmed by recent observations,” but Giovanni Leone, perhaps better known as Leo Africanus, an author and traveller, who lived and wrote in the latter part of the fifteenth and the early part of the sixteenth century—*i.e.*, at least 1300 years after Ælian—and whose accounts of what he saw are singularly devoid of fable, tells the story in a manner which makes it hard to believe that he was not relating facts which actually came under his own observation. He tells us—we quote from the French translation of his “Description of Africa,” published in 1556—that he was on the Nile, “distant de Caire environ quatre cens mille,” when he saw several crocodiles upon some little islands in the middle of the river “qui estoient étendus au Soleil, les gueules bées ; dans lesquelles aucuns oysillons de blanc panage, & grandeur d’une grive entroyent dedās, là ou ayans sejourné quelque espace de temps s’en retournoyent, dressans leur vol ailleurs. Dont estāt curieus d’entendre la raison de cela, je m’en enquis, & me fut dit, qu’entre les dens du Crocodile demeurent quelques filés de chair, ou poisson pendans ; lesquels venans à se putrier, se convertissent en vers, qui les molestent aucunement, & estans aperceus remuer par ces petits oyseaus volas, viennent à entrer dans la gueule pour les māger, ce que ayans fait, le Crocodile ingrat tâche

à les engloutir, mais se sentant piqué au palais d'une dure & poignante épine (que l'oyseau a sur le sommet de la tête) il est cōtraint de desserrer, donnant lieu à la fuite de l'oyseau, & avenāt q' j'en puisse recouvrer un, je raconteray cette histoire plus surement, & à la verité." Again, Paul Lucas, who wrote in 1719, though by no means an exact author or worthy to be too implicitly believed, distinctly says that he saw close to his boat some birds "like a lapwing, and near it in bigness," which went "into the crocodiles' mouths or throats . . . and after they had stayed a little while the crocodiles shut their mouths, and opened them again soon after to let them go out." He was told by the people that the birds in question "feed themselves on what remains between this animal's teeth by picking them ; and, as they have a kind of spur, or very sharp thorn, in the tops of their wings, they prick the crocodile, and torment him when he has shut his mouth, till he opens it again, and lets them out ; and thus they secure themselves from the danger they were in." And he adds the suggestion that, "likely these are the birds which Pliny calls *Trochilos*." This last story told to Lucas by the people of his time is very interesting, as it agrees exactly in all its details with an account given by Dr. Leith Adams, of which he says:—"This addition to the old story was given to me on good authority, as being very generally believed by the Nile boatmen."

Can it be that, after all, the Egyptians have been right through all these ages, and that they have more real knowledge of the habits of the birds inhabiting their own country than modern ornithologists are inclined to allow ?

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