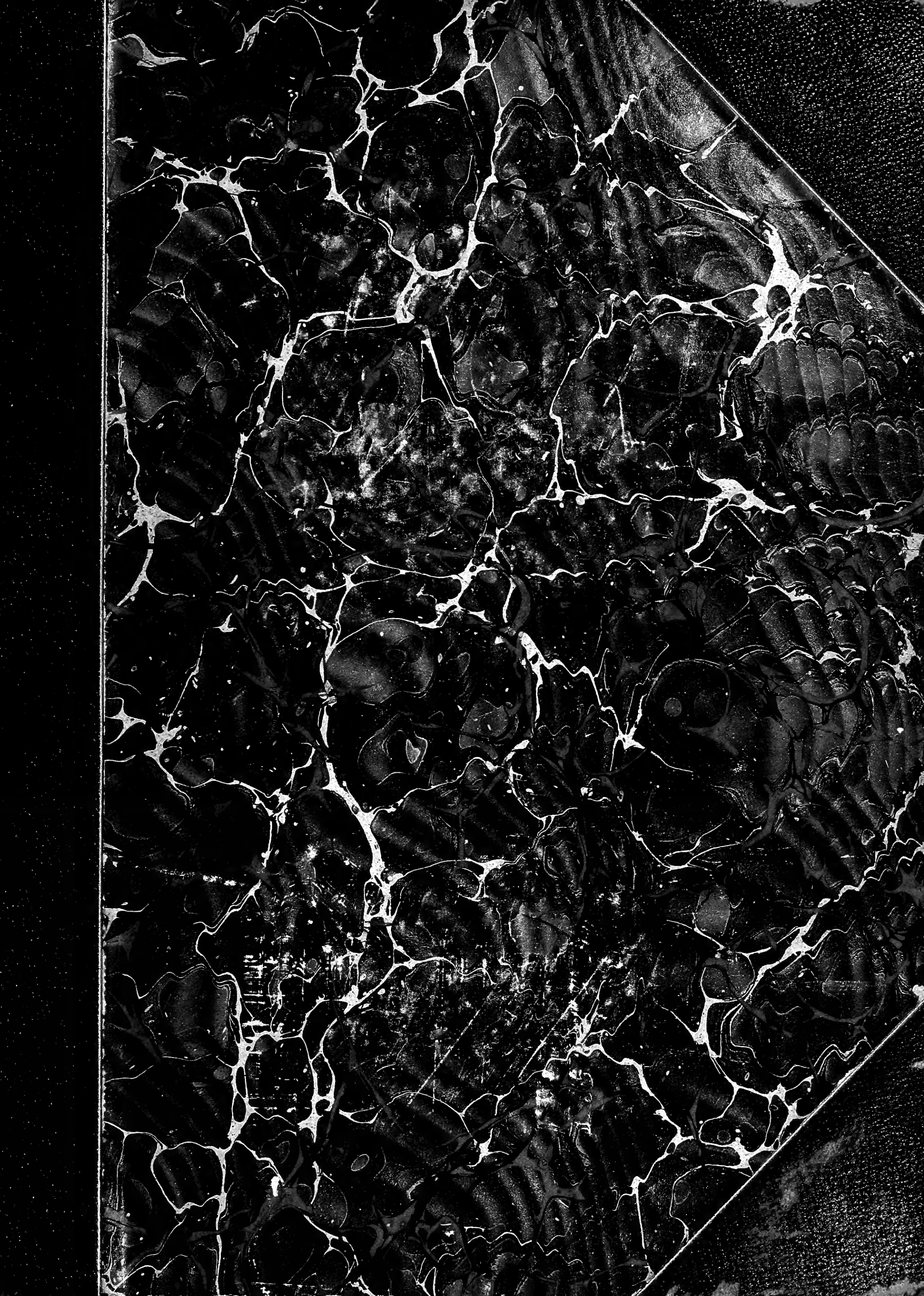

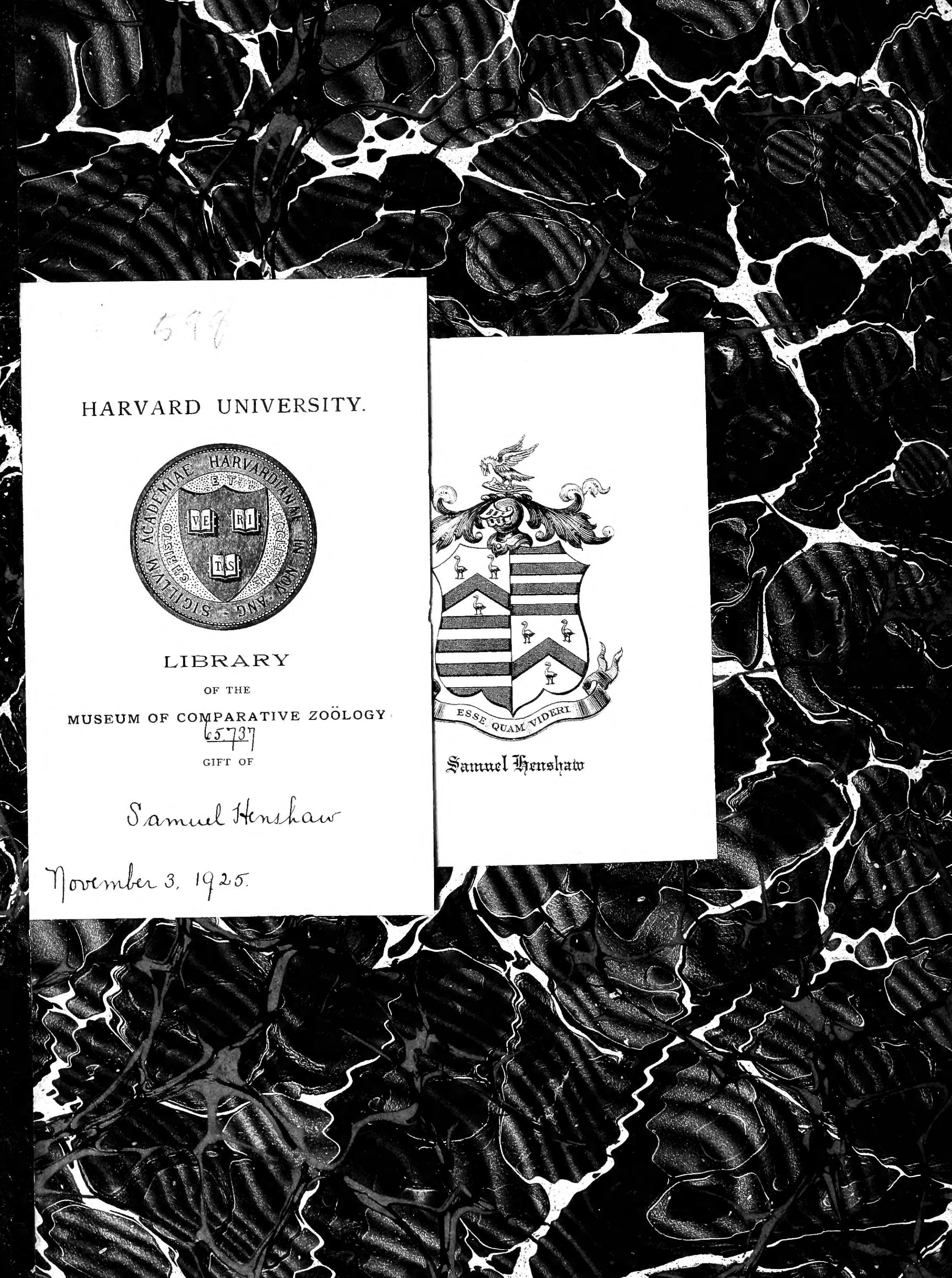
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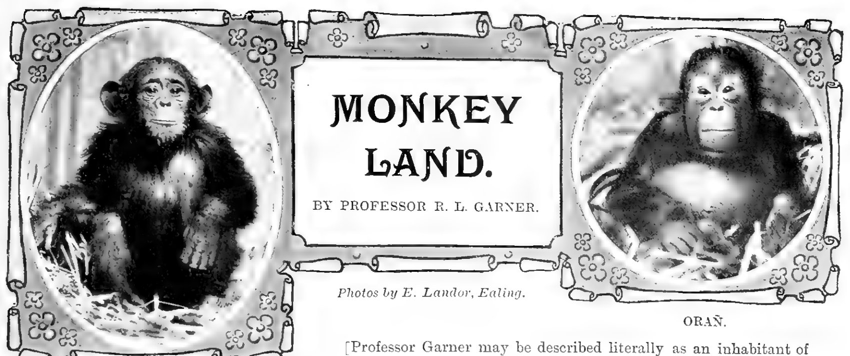
OKAPIS.

From an original painting by Sir Harry Johnston, G.C.M.G., K.C.B., D.Sc.



CHIMPANZEE.

Photos by E. Landor, Ealing.

ORAÑ.

MONKEY LAND.

BY PROFESSOR R. L. GARNER.

[Professor Garner may be described literally as an inhabitant of Monkey Land; for ten years off and on he has lived in the very heart of Africa studying the life and habits of Monkeys and Apes.]

WOULD you like to go with me into Monkey Land and see its happy denizens in a state of nature? I am aware that you can go to a zoological garden or menagerie and see a few living specimens of the monkey tribe; but these poor little captives, shut up in iron cages are not fair examples of the race to which they belong. True, it is better to see them than to see none at all, but the conditions under which they live are unnatural and the animals become so, too. The restraints under which they are placed hamper their faculties and modify their actions. The strong ones impose upon the weak, and the latter have no refuge from assault. Most of them live in a constant state of anger or distress. Changes of diet and climate also greatly affect them. If you would know the social life and true character of these merry little waifs you must go into their native haunts and live among them, under conditions to which nature has assigned them.

In the very beginning of my studies of the speech and habits of monkeys I became aware of certain obstacles which lay in the way of success, and in order to remove them I determined to go into Monkey Land where I might learn their speech and modes of life in their purest form. It was not my purpose to teach them anything, but it was to ascertain the innate faculties and resources of the mind with which they were endowed.

As a safeguard against the dangers that infest the wild regions in which these harmless creatures live I devised a cage to live in. This consisted of 24 panels of strong steel wire, woven into a lattice and framed in iron. Each panel is 39 inches square, and weighs 17 pounds. They can be quickly bolted together or taken apart, and when erected they form a cube of six and a-half feet, equal to two metres square. This was set up on a framework of stakes and poles which raised it about three feet from the ground. Over the top of it was placed a roof of palm leaves, and the floor was made of loose boards steeped in tar, which was a partial protection against lightning and insects. In case of rain or storm I had some canvas curtains to hang up at the sides.

The furniture consisted of a canvas bed, a swinging table and folding camp chair. During the day the bed was reefed to the wires of the cage so as to make room for the chair and table, and they, in turn, were folded up and put aside at night. In one corner was a small kerosine stove used for heating water and warming my food. In addition to these few effects were six tin packing cases in which were my wearing apparel, a supply of tinned food, camera and photographic supplies, stationery,

ammunition, medicine and a few useful tools. My arsenal consisted of a magazine rifle and a revolver.

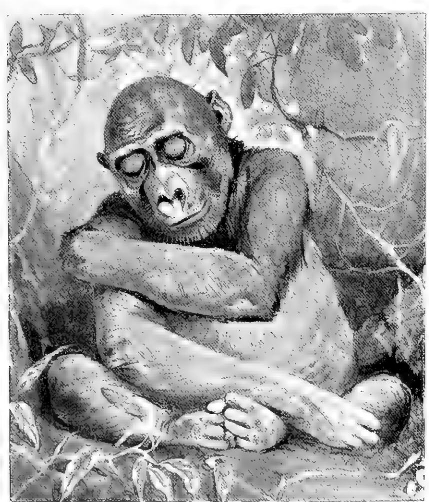
With this outfit I set out for Gaboon in West-Central Africa, and from there made my way to the basin of Ñkami Lake, where, in the deep forest regions that surround it, live, not only vast numbers of monkeys of various kinds, but also the gorilla and chimpanzee. There, in the very heart of their wild domain, I set up my cage and lived in it for a period of nearly four months, during which time I saw the great apes and scores of monkeys under conditions which no other student of nature has ever enjoyed, and learned from them many things which no one can ever learn from those in captivity. There, in the freedom of his native jungle, unaware of the presence of man, I saw the stolid gorilla in the act of gathering and eating his food; saw him hunt and capture his prey; saw him run, walk and climb as he is wont to do; and heard his wild shrieks ring through the sylvan corridors. There, under like conditions, I also saw and heard the more discreet chimpanzee, with his big brown eyes always on the alert for food or danger, and troups of timid monkeys of many kinds. There, in the shadows of that wild forest, where nature reigns supreme, at any hour of the day may be seen some denizen of that strange abode seeking prey or seeking refuge, and at any hour of the night may be heard the cry of distress which tells a tale of tragedy.

From a Photograph.

NATIVES SKINNING A GORILLA.

Much of the last ten years of my life has been spent in Africa in pursuit of the problem to which I have devoted so much of my life and to which I expect to devote the remainder. During the course of my studies along the chosen line of research I have owned, or had at my disposal, a great number of apes and monkeys. The chimpanzee, being next to man, in the order of nature, has been the favourite subject of my work. Within the last ten years I have owned seven specimens and had access to as many more. The one to which I was most warmly attached was called Moses. He lived with me for nearly a year and was my companion during my long sojourn in the cage in the Nkami forest; but the most intelligent one was his mate, who was called Aaron. He was also with me for several months and came with me to England, where he died a few months after his arrival.

The chimpanzee is easily domesticated and very affectionate. He readily learns



From a Photograph supplied by the Author.

A YOUNG GORILLA CAUGHT NAPPING.

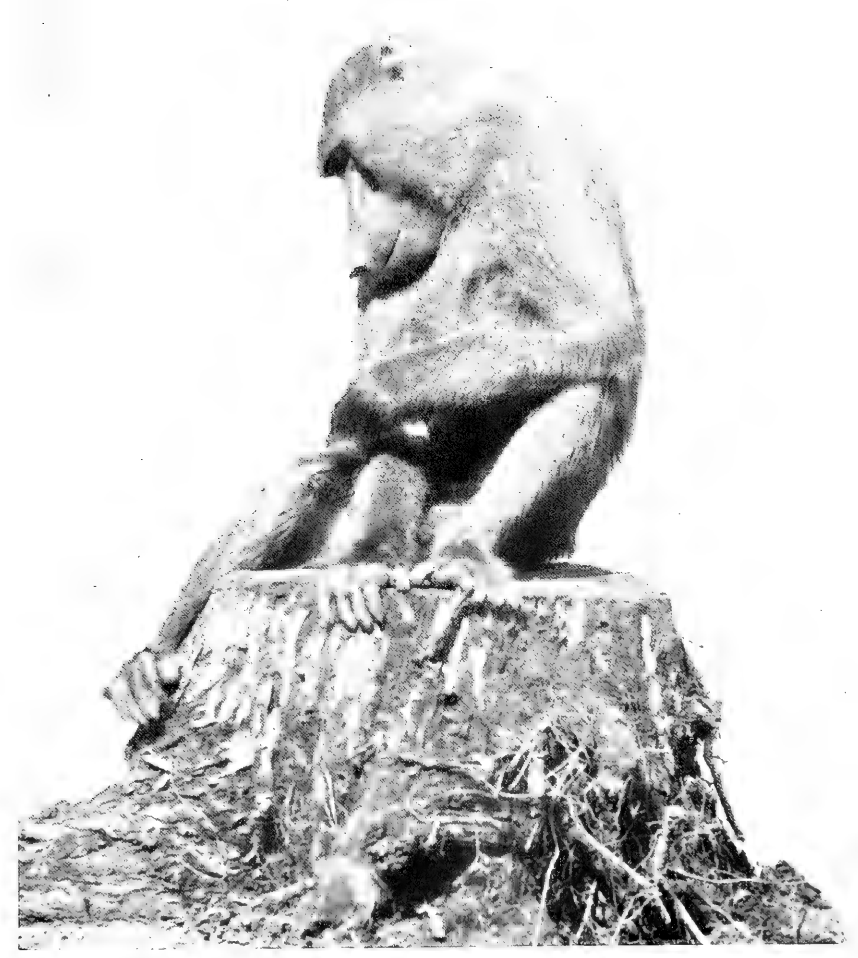


Photo by Ottomar Auschutz, Berlin.

A CHACHMA BABOON.

Though Baboons are said to be the only mammals that thoroughly understand combination, Professor Garner thinks they only act together for defence, and never preconcert any plan of attack as some have stated they do.

many customs of man and executes them with great skill and precision. Many of them acquire the habit of smoking; some of using intoxicants; others eat with knife, fork and spoon; a few learn to use a crayon or pencil with some degree of skill; several have become expert in riding the tricycle and one has learned to ride a bicycle. Of all animals known to science, the chimpanzee is of the greatest interest and is now being studied with more care than ever before and gains more attention from the masses than any other animal in captivity. I have taught some of them to select and associate colours, geometrical forms and sizes. In fact they have acquired all the rudiments of art and logic and take very kindly to training. Their minds are active and their faces mobile and expressive. They evince all the human passions and emotions, are equally capable of mirth and grief, and some of them evince a strong sense of humour which they sometimes express in the form of a practical joke.

A PEEP AT THE CAGE.

Several monkeys (always with a leader at their head) would often come as close as they dare to examine Professor Garner's cage in the jungle.

One that I had in hand for a time was given to frequent fits of temper but instead of whipping him for it I used a rubber ball with a small hole in one side. Filling the ball with water and spurting it into his face always had a good effect on him. He disliked having this done and the instant he saw the ball he became quiet and docile. At first he was greatly puzzled. He often played with the ball and had never found any water about it. On one occasion, after having turned the battery upon him, I refilled the ball so as to repeat the dose if necessary. He watched the operation, then sidled around so as to be out of range and took hold of my hand. I offered him the wet ball but he declined to touch it. He pulled and pushed at my hand as if to see whether or not the thing was loaded. To amuse him I spurted the water at a small monkey in a cage in front of me. The monkey jumped with surprise and looked about him to find out where the water came from. This diverted the ape and he kept trying to get me to spurt more water on it, but I turned the stream away and for a while continued to amuse him until he finally caught the idea of pressing the ball. I gave it to him but he was very awkward in using it. As soon as he learned how to squeeze it he turned it upon the monkey and I

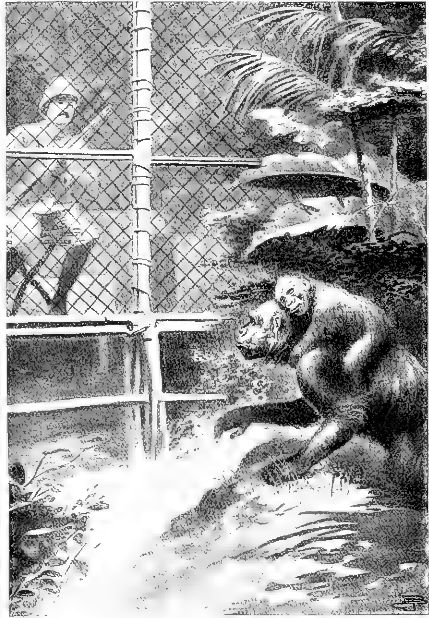
Photo, York & Son, Notting Hill.

A WHITE-HANDED GIBBON.

These apes have very long arms and can swing enormous distances, an authentic report credits one of them with leaping 42 feet from the limb of one tree to that of another.

had to interfere. He soon learned both to fill and to squeeze the ball without difficulty. He was careful to keep the hole turned away from himself, but he cared very little for the welfare of others. When permitted he never failed to give the little monkey a spurt and never tired of doing the trick. To turn it upon a dog was equally funny to him and the twitch of his risibles plainly told what passion was ruling his mind. The laughing and crying of a chimpanzee are equally humanlike.

The gorilla comes second below man in the scale of nature. Alive, and in the forest he does not look very much like the pictures in books nor does he act as the specimens in museums indicate, but behaves himself much the same as other animals do. They are crafty woodsmen and always on the alert for danger. By nature they are morose, often sullen and always resentful, but they will not attack man unless provoked to it. Then they are no doubt very formidable. They evince a strong aversion to man. They are slow to acquire and loth to practice any civilized habit, but within their own sphere of life they are quick to perceive and prompt to act. None of them have lived long in captivity even in their native climate.



GORILLA MOTHER WITH YOUNG.

This particular ape came quite near to Professor Garner's cage, presenting a splendid opportunity to him of shooting the mother and securing the young, but as this would have defeated the object of his residence in the jungle (by frightening away other apes and monkies) they were allowed to escape.

Third in rank is the ourañ. His physical type alone gives him this place. In mind he is as stupid as a lemur, and in action, as clumsy as a sloth. It is true that certain features of the head are very humanlike, especially in the young, but no other ape is less like man in mental qualities. He is passive in temper and acts more like a slot-machine than a living thing. They seldom live long in captivity or learn anything worthy of note. I have never been guilty of owning one, but I have studied five or six specimens from which I make the deductions set forth. The picture given in the headpiece shows the face type of the genus, which strongly resembles that of man, but the expression is more like that of a pie.

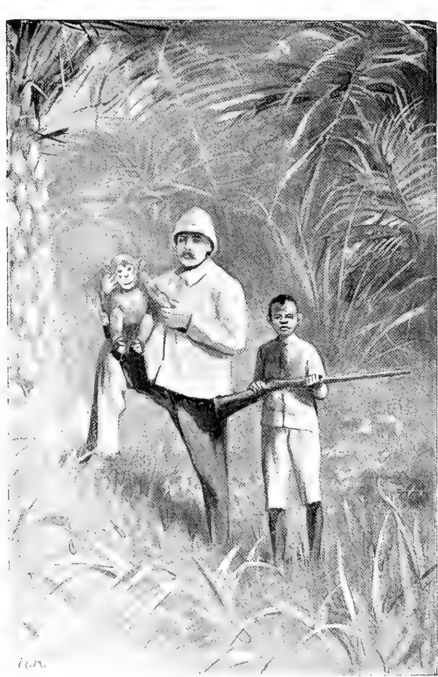
The fourth place in the scale is occupied by a genus of apes, of which there are seven or eight species. It is difficult to say which of three is of the highest type. They have about equal claims to it. The lowest of them is no doubt the siamang. The gibbon is one of the most interesting genera of all the apes, though the smallest in size, the shape of the head and proportions of the brain are much like those of man. It is quite impossible in one brief article to review in detail either the physical or mental characters of this group of apes and I must devote the space at my disposal to my recent work among the monkeys.

In the delta regions of the Ogowè river in Africa, are vast numbers of monkeys and it is only natural to suppose that any person living there could, at any time, see schools of them, but such is not the case. By constant efforts and liberal baiting it

is possible to win their confidence until you can get within a few yards of them, as I have done in two instances, but the feat involves much time and patience, and it is still a matter of doubt, whether or not, they would ever submit to being caressed by a man. They are, by nature, timid and alert. A man going through the forest may often hear them but rarely sees one. In passing, by canoe, along the water-ways, it is not so difficult to see them. It is a common thing to see two or three at a time perched in the top of a palm or some other tree, eating the fruit. The canoe being so silent in its approach does not give them much alarm, but if you raise a stick or a gun they dash away like so many ghosts. I regret that people will molest these harmless creatures, but that cruel instinct of man which prompts him to take life so freely causes other animals to shun him.

Among the specimens that I have recently had at my disposal is a *mona*. As the name of her species is a very pretty one and also feminine, I gave that to her as a cognomen. She was a timid creature, with rich brown eyes which looked so innocent and demure that no one would suspect little Mona of doing anything bad. Like others of her sex she had a soft sweet voice and a gentle manner which won their way to every heart; but in truth she was as naughty as she was winning.

This type of monkey is rather pretty in colour, delicate in form and graceful in action. To see Mona catch insects on the wing was a real pleasure. Nothing else ever inspired in her such activity, and no athlete could rival her skill in leaping and vaulting after them. If a fly, bug, beetle or moth came within reach of her it rarely escaped. Frequently she would spring two or three feet and catch it as it flew.



From a Photograph.

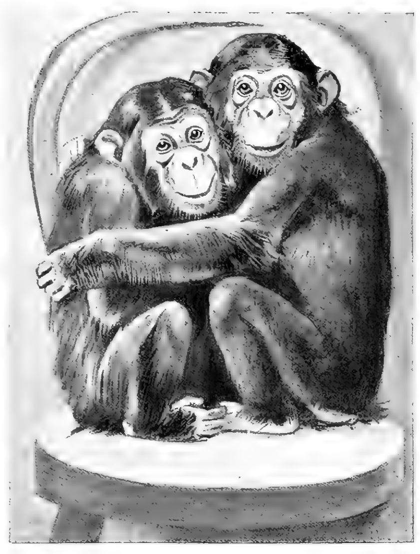
A STROLL IN THE JUNGLE—PROFESSOR GARNER. MOSES, AND NATIVE BOY.

Moses was Professor Garner's first Chimpanzee pet; he always accompanied the Naturalist on his excursions in the jungle.

Her eyes were so quick and her aim so accurate that often in the midst of her play she would snatch some flying creature and resume her play as though she had not stopped.

One of the most ingenious things Mona used to do was baiting flies. After eating a banana she would rub the inner side of the rind on a certain spot on the floor or some smooth surface and hide the rind used for this. She would then seat herself and wait for the flies to collect about the bait which she had prepared for them. As soon as one was engaged in eating the bait, she would sweep out her little black hand and snatch it. She rarely missed one, and two or three times a day she would arrange a fresh bait for them. It was a clever method of catching them and was her own scheme, as the gentleman who had reared her assured me that she had never been taught to do it.

There is a certain kind of wood-beetle that bores into dead bark and wood. By placing the ear against the tree near the point where the insect is at work the sound of his gnawing is sometimes audible, but it requires a delicate sense of hearing to detect it and a clear eye to find the hole where the insect enters the surface. Mona's quick eyes and ears, however, never failed to locate one of these. She would first examine the aperture to see whether or not it was freshly made. If it was an old one she gave it no further notice, but if new, she quickly put her ear to the surface and listened, in order to locate it. Then in an instant she began to tap her knuckles on the surface in order to drive it out, meanwhile anxiously watching the hole. As soon as the beetle was fairly outside she would seize and kill and then devour it. She is perfectly familiar with the habits of certain insects and knows the poisonous and stinging sorts from all others.



ELISHEBA AND AARON.

Aaron, though not the brother of Moses was for a short time his companion; after the latter's death Elisheba joined the family in the jungle, but much to Aaron's distress soon sickened and died.

Mona was allowed to go at liberty most of the time, but she was a real little thief, and I sometimes thought she must have cleptomania. Her femininity could not resist a mirror, and her idle curiosity was more than feminine. But with all her simian faults she was a dear and affectionate little creature who seemed always at night to have repented of her sins committed during the day. Cuddling herself in my arms, and uttering a peculiar, tremulous sound she always cajoled me into absolving her from all blame for anything she had done.

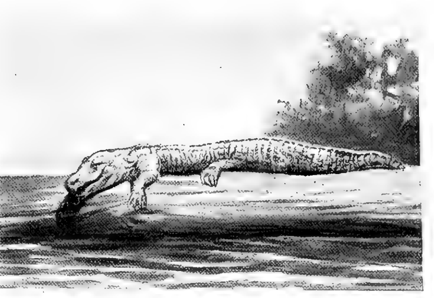
To those who live in the wake of human progress, far removed from the normal order of things, the voice of nature is lost in the strife and turmoil around them. They hear only the echoes of human vanity, of the wail of human want; but go with me into Monkey Land, live among its strange people and gaze into the unmasked face of Nature, and I will show you a new world of thought and action. It will not alienate you from mankind, but it will draw around you more closely the bonds of fellowship with all living things.

R. L. Garner.

[Professor Garner has promised to contribute other articles to future numbers of "Animal Life." The next one from his pen will be a collection of hitherto unpublished anecdotes—collected by him for many years past—giving remarkable illustrations of extraordinary intelligence in dogs from well authenticated sources.]

A WONDERFUL CROCODILE.

[The first living creature to pass over Niagara Falls and come out alive. Illustrated from Photographs.]



THE START.

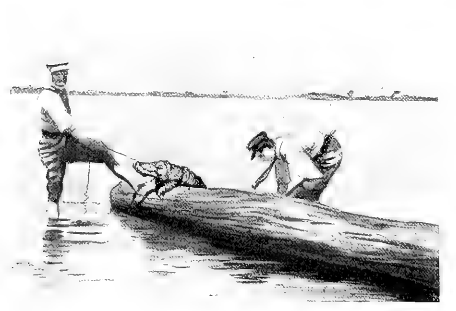
UNTIL twelve months ago no living creature had ever passed over Niagara Falls and lived to tell the tale, the first part of that feat has now been performed, but as the creature in question was a Crocodile he is unfortunately not able to relate his experiences. However, the progress of this reptile during its perilous journey was watched from different points by various naturalists, and so a fairly consecutive account can be given of its unparalleled experience.

The gentleman responsible for the experiment was Mr. F. C. Bostock, who owned a fine Egyptian Crocodile, a splendid swimmer, very cautious, and with a tremendously tough hide. He had the Crocodile taken to Navy Island. Here it was placed on board a large log, towed out well into the current until it was certain to go over the falls and released.

DRIFTING.

The log began to drift rapidly, and soon, the current becoming more turbulent, was rolled over, and the Crocodile found itself in the water. Little recking what lay in front he drifted lazily on, now beneath the water, now coming to the surface. Soon the waters grew choppy, and kept him under most of the time, carrying him on to the American side of the falls. In twelve minutes from the start he was swept over the mighty cataract. For an hour and a half no one saw any signs of him. What happened during this period, or how far he was plunged into the great abyss beneath, who shall say?

Meanwhile a dozen men were hurrying to the river beneath the falls and placed themselves on both sides where they would see him when he swam into smooth water, if ever he should. After a weary wait of nearly 90 minutes one man saw something animate far up the river. Five minutes later it was positively identified as the Crocodile, who, making for the bank with a few powerful strokes of the tail, was safely dragged ashore with a rope.



THE FINISH.

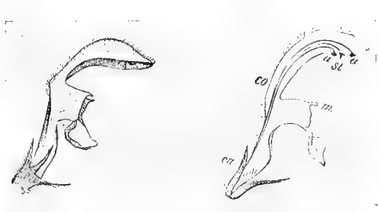
By the Rt. Hon. The Lord Avebury, P.C., F.R.S. (Sir John Lubbock).

Showing why flowers are different colours; why they go to sleep; why some keep different hours from others; and the devices they use for procuring their food.

PART I.

MANY people seem to consider that while plants no doubt add greatly to the beauty and attractiveness of a country, they are, in themselves, of little interest. I am often told that Botany is a dry Science. No Science, however, can be dry, certainly not Botany. Some botanical books, no doubt, may be. Technical terms, descriptions of structure, discussions on nomenclature are important and necessary, but they are interesting only to specialists, and may well be left to them. But the habits of plants, their mode of life, their adaptation to their surroundings must surely be interesting to any intelligent person. A great many people look for plants, but comparatively few look *at* them. Yet they are as interesting as they are beautiful.

Why, for instance, are some flowers green, others white, yellow, red or blue? Why are some open, some tubular, and others closed? Why do some open in the day and others by night? Why do some flowers sleep? What regulates the endless variety in the forms of leaves, fruits and seeds?



Figs. 1 and 2.

From a drawing by Professor F. E. Hulme, F.L.S., F.S.A.

Fig. 3.

It is astonishing how little many people even among those who live in the country, know about our commonest trees and shrubs. Many do not seem to know that all trees have flowers. This is no doubt because in so many of them—Oaks, Elms, Beech, Ash and others, they are small and green. Indeed, speaking generally, we may say that when the pollen is carried from one flower to another by the wind the flowers are small and green. In such cases, however, an immense quantity of pollen is wasted. Everyone must have noticed the great clouds of pollen produced by Scotch Firs. On the contrary, when it is carried by insects much economy is effected. In such cases it is an advantage that flowers should be of a different colour from the leaves, because it renders them more conspicuous. The scent acts in the same way, and the honey gives the insects a definite inducement for their visits.

It is obvious that any blossom which differs from the form and size best adopted to secure the due transference of the pollen would be less likely to be fertilised than others; while on the other hand, those richest in honey, sweetest, and most conspicuous, would most surely attract the attention and secure the visits of insects; and thus, just as our gardeners, by selecting seed from the most beautiful varieties, have done so much to adorn our gardens; so have insects, by fertilising the largest and most brilliant flowers, contributed unconsciously, but not less effectually, to the beauty of our woods and fields.

Let us take some familiar flower and see if we can suggest explanations for the colour, form, and structure:

The flower of the common white Deadnettle* *(Fig. 1)* consists of a narrow tube, somewhat expanded at the upper end, where the lower lobe of the corolla forms a platform, on each side of which is a small projecting lobe *(Fig. 2 m)*. The upper portion of the corolla is an arched hood, *(Fig. 2 co)*, under which lie four anthers *(aa)* in pairs, while between them, and projecting somewhat downwards, is the pointed pistil *(st)*. At the lower part, the tube contains honey, and above the honey is a row of hairs almost closing the tube.

Now, why has the flower this peculiar form? What regulates the length of the tube? What is the use of the arch? What lessons do these lobes teach us? What advantage is the honey to the flower? Of what use is the fringe of hairs? Why does the stigma project beyond the anthers? and why is the corolla white while the rest of the plant is green?

The answers I believe are as follows:—In the first place, the honey attracts insects. If there were no honey, they would have no object in visiting the flower. The bright colour is useful in rendering the flowers conspicuous. The platform serves as an alighting stage for bees. The length of the tube has reference to that of their proboscis, and prevents the smaller species from obtaining access to the honey, which would be injurious to the flower, as it would remove the source of attraction for the

* See my Flowers, Fruits, and Leaves, p. 1 (Macmillan).

From a drawing by Professor F. E. Hulme, F.L.S., F.S.A.

Fig. 4.

bees, without effecting the object in view. The upper arch of the flower protects the stamens and pistil, and also presses them firmly against the back of the bee; so that, when she alights on the stage and pushes her proboscis down to the honey, her back comes into contact with the pollen. The row of small hairs at the bottom of the tube prevents small insects from creeping down the tube and stealing the honey. Lastly, the small processes on each side of the lower lip are the rudimentary representatives of parts, formerly more largely developed, but which, having become useless, have almost disappeared. Hence we see that every particular and detail in the flower has its own purpose and function.

In some cases plants act almost as if they possessed intelligence. We all know how difficult it is to catch a fly. But the Sundew lives on them. Various other plants feed on insects, capturing them by a series of most ingenious devices. The Grass of Parnassus deceives flies by mock drops of honey, but more mercifully makes no attempt to injure them when they have served its purpose.

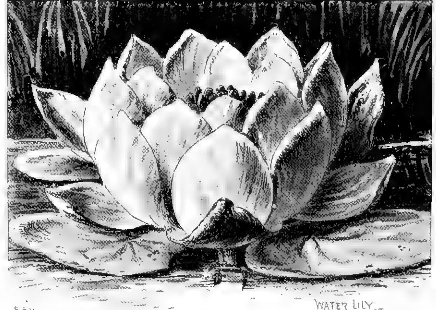
Some plants mimic others. The white Dead Nettle (*Fig. 3*), to which I have already referred is a familar instance. It frequents waste ground and road sides, and seems to love the Stinging Nettle. The plants belong to quite different families, but the leaves and general habit are so similar, that from a little distance it is almost impossible to distinguish them unless the Dead Nettle is in flower. I can hardly doubt that the Dead Nettle is often spared from its similarity to the Stinging Nettle.

Again, it is known that many flowers sleep. Why should they do so? In animals we can understand it; they are tired and require rest. But why should flowers sleep? Why should some flowers do so, and not others? Moreover, different flowers keep different hours. The Daisy (*Fig. 4*), opens at sunrise, and closes at sunset, whence its name the "day's eye." The Dandelion (*Fig. 5*) is said to open about seven and close about five; *Arenaria rubra* to be open from nine to three; the White Water Lily (*Fig. 6*) from about seven to four; the common Mouse-ear Hawkweed (*Hieracium Pilosella*) from eight to three; the Scarlet Pimpernel (*Anagallis arvensis*) to waken at seven and close soon after two; *Tragopogon pratensis* to open at four in the morning, and close just before twelve, whence its English name, "John go to bed at noon." Farmers' boys in some parts are said to regulate their dinner-time by it. Other flowers, on the contrary, open in the evening.

From a drawing by Professor F. E. Hulme, F.L.S., F.S.A.

Fig. 5.

Now, it is obvious that flowers which are fertilized by night-flying insects would derive no advantage from being open by



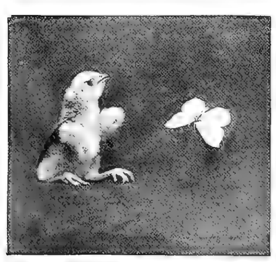
From a drawing by Professor F. Hulme, F.L.S., F.S.A.

Fig. 6.

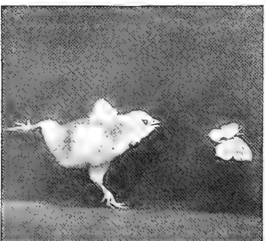
day; and on the other hand, that those which are fertilised by bees would gain nothing by being open at night. Nay it would be a distinct disadvantage, because it would render them liable, firstly to be robbed of their honey and pollen, by insects which are not capable of fertilising them, and secondly, to have the pollen injured, and the honey washed away, by rain. I have suggested then, and it is now I think generally admitted, that the closing of flowers may have reference to the habits of insects; it may also be observed also in support of this that wind-fertilised flowers do not sleep; that some of those flowers which attract insects by smell, emit their scent at particular hours; and that night opening flowers are as a rule white or light yellow. Thus, *Hesperis matronalis* and *Lychnis vespertina* smell in the evening, and *Orchis bifolia* is particularly sweet at night. The evening *Lychnis* is white, and the nearly allied *Lychnis diurna* is red.

Let us take the history of one very common flower—the Common Dandelion. When it is in bud the flower stalk is short and lies on the ground. When the flower is ready to open, the stalk raises itself perpendicularly. What we call a Dandelion flower is really a bunch of flowers—some hundred florets ranged on a flat disk. The outer rows of florets open first, then the inner and inner rows, ending with the centre ones. This lasts some days, and every evening about sunset the flower head closes up, so as to protect the delicate florets from night dews, and probably from night insects. I found however that I could keep a Dandelion awake all night, by exposing it to the blaze of an Argand lamp. When all the florets have opened, the yellow corollas shrivel up, the stalk lays itself down on the ground so as to be out of danger, and the seeds gradually mature. When they are ripe the flower stalk by some mysterious instinct becomes aware of the fact, and raises itself so as to stand up boldly in the wind, which seizes the seeds by their beautiful parachutes, carries them off to fresh fields and pastures new, and thus enables the plant to sow itself in any suitable place.

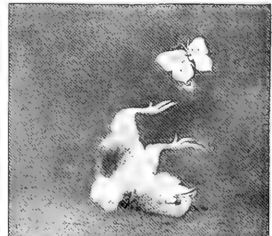
(*To be continued.*)



THE INTRUSION.



THE CHASE.



THE DEFEAT.

From photographs by W. Saville-Kent, F.Z.S.

Photos by H. T. Malby, F.R.P.S., Woodford.

HYBRID TEA ROSE, KAISERIN AUGUSTA VICTORIA.

Taken by the telephoto lens to secure the better perspective resulting from the greater distance between the lens and the subject. The small photo at the top left-hand was taken by an ordinary camera.

How the Avington fledglings were killed by their jealous parents.

By W. H. Hudson, Author of "British Birds."

TO many of us who take delight in birds, the raven, whether we love it or no, is the most fascinating of feathered beings. Its powerful character impresses the imagination. Certainly the raven has an intelligence almost uncanny in a bird; and a savage spirit too, and power; and a deep human-like voice; and a very long life. These qualities affect the mind and have been the cause of the raven's strange reputation in former ages—the idea that he was something more than a bird; a messenger of doom, an evil spirit, or the spirit of some great dead man revisiting the scenes of his earthly career.

Photo by W. P. Dando, F.Z.S., Regents Park, N.W.

A HAMPSHIRE RAVEN.

Common all over the country down to the early years of the ninteenth century, he has now been pretty well exterminated as an inland bird. On the iron-bound coasts where his eggs are comparatively safe, and in a few wild mountainous spots in the interior, he still exists. But it does not seem long since he was lost, for his memory still lives: "raven trees" are common all over the country—trees in which the vanished birds built their big nests and reared their young each year. Tales of "last ravens"

are also told in numberless places all over the country. Everyone who knows the Selborne *Letters* will remember the pathetic history of the last ravens in his neighbourhood told by Gilbert White. That is a long time back, and it is known that ravens continued to breed in Hampshire for over a century after White's death. I am here speaking of the *inland-breeding* birds; for up till now one pair of ravens still breed on the Isle of Wight cliffs. It is of the last pair of birds that bred inland, on trees, that I have an anecdote or two to relate in this place. These were the Avington ravens. How long they inhabited that ancient noble domain I do not know, but it is certain that they continued to breed annually in the park until about the year 1885. The "ravens' clump" where the birds had their nest still flourishes, but the more famous, immeasurably older tree close by—the Gospel Oak—is alas! dead, These Avington ravens were a good deal persecuted, but invariably when one lost its life the other would disappear for a few days to find and bring home a new mate. At last some scoundrel got both birds, and that was the end, for of course no others came to fill their place. I was fortunate some time ago in making the acquaintance of an old man born and bred at Avington who was able to tell me a good deal about the famous ravens. He is a man of a curiously interesting type, found in many parts of England, but perhaps more common in the southern half of Hampshire than in most places: small, good-looking, oval-faced, dark-skinned, and black-haired; a little man, tough and lithe-bodied as a cat, of a bright, lively disposition, and very quick-tempered. When a young man he worked for some years as under woodman in the estate, and he had many exciting stories to tell of his tree-climbing feats. In those distant days—about 1850—climbing contests were common among the men who worked in the woods and parks, and he was the champion tree-climber in the place. One day, when coming from work with the other men, a squirrel was seen to run up an exceedingly tall isolated fir tree, and he, in a moment of madness, undertook to catch and bring it down. Up after the squirrel he went until he could go no further, and the little thing was still above him, afraid to jump down and give him a chance to capture it, clinging to a slender branch directly over his head and out of his reach. He then thought to knock it down, and having selected a small branch for the purpose was engaged in wrenching it off when the squirrel made his jump, and as it came flying down past his head he attempted to capture it, using both hands, but missed it, and at the same time his legs lost their grip on the branch he was on; and down after the squirrel he came, crashing through the higher branches and coming at last with a thud to the earth. He had fallen on his back, and was taken up senseless and terribly

As the Squirrel came flying down past his head, he attempted to capture it, using both hands, but missed it, and at the same time his legs lost their grip, and down after the Squirrel he came, coming at last with a thud to the earth.

Photo by Scholastic Photo Co., Parson's Green.

A RAVEN AT HOME.

As an inland bird the Raven has been nearly exterminated; but he still exists on mountainous spots.

injured and sent away to the Hospital at Winchester. For twelve long months he was kept there, on his back, and when sent home was told that he would never be fit to do any out-door work, although he might perhaps live for some years. They were wrong since he did get perfectly well, and fifty years or more after the accident I have seen him working like a young man, mowing, digging and wood-cutting.

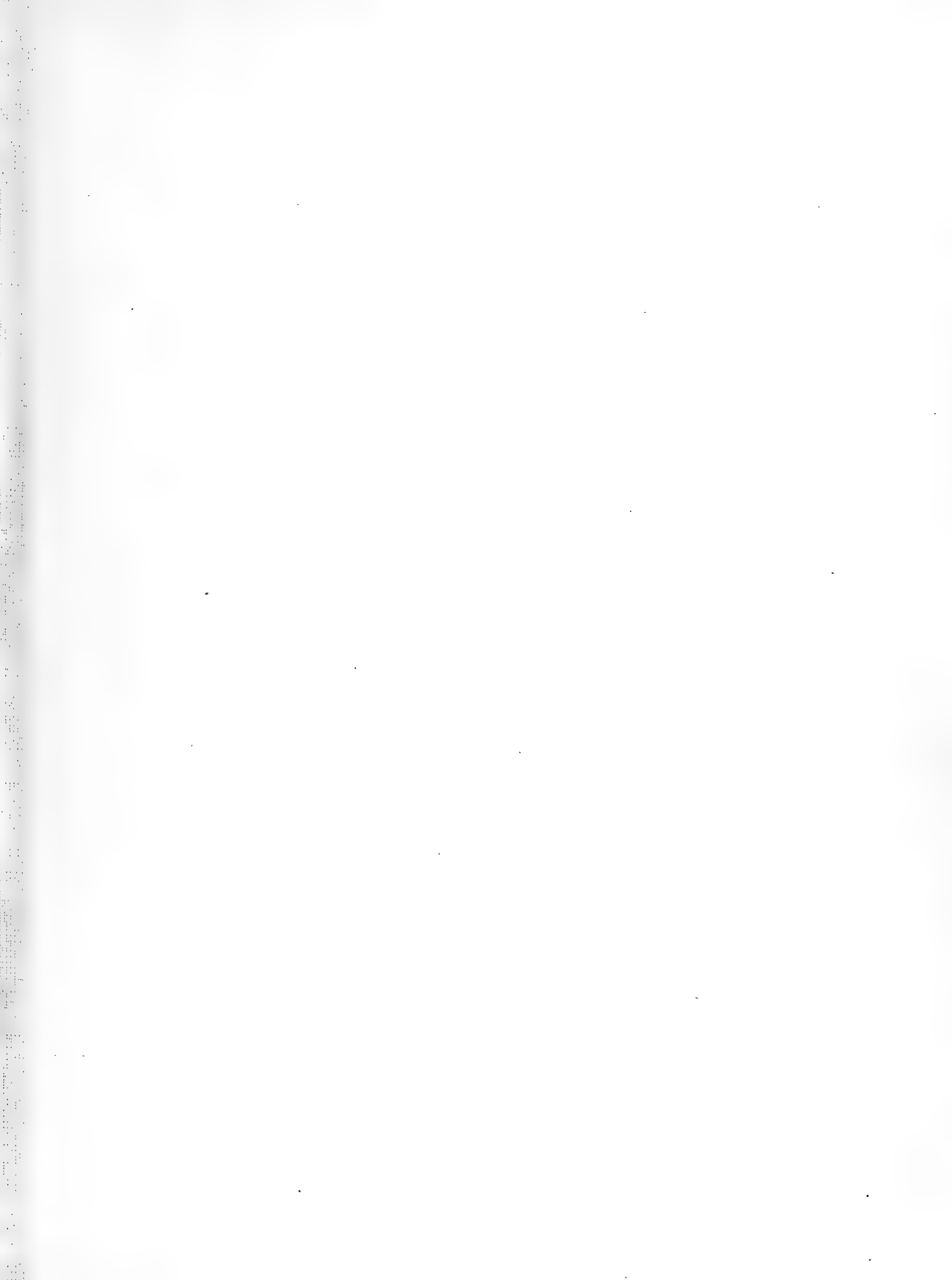
Two or three years before this terrible fall put an end to his tree-climbing exploits, a member of the Ducal family who were then the owners of Avington thought it would be interesting to have some tame ravens as pets, and the young champion climber was instructed to take the fledglings from the nest in the park.

When he got up to the nest he was surprised to find six birds, half-fledged; and he took them all, and all were safely reared at the house. These birds when grown remained perfectly tame although they were never pinioned; they spent most of their time flying about the park and outside of it, but invariably came to the house to be fed and to roost.

As time went on it was observed that the old birds became more and more jealous of their presence in their territory and from day to day they persecuted them with increasing fury. The young, accustomed to be fed at the house, refused to leave the place, as the young reared annually in the nest are invariably compelled to do; and the result was that one by one they were killed by their savage parents. My informant actually witnessed the killing of one of them: the young bird tried to escape by flying to the house but was buffeted with such fury that in the end it was borne down to the earth in the park and was then quickly done to death by the savage blows of the two powerful beaks.

There are other birds just as intolerant of the presence of their fully-grown young as the raven. This is the case with our robin redbreast, but in the case of this species it is the cock bird only that fights and the fight is thus a more equal one. The young bird sometimes conquers the old one. In the raven, the mother bird hates her children as much as the father does, and as they fight in company, playing into each other's hands, and take their young one by one, they are invariably the victors.

W. H. Hudson



Brahma Pootra Fowls.

From an original painting by Harrison Weir.

An anecdotal account of some Queer Inhabitants of the Seas—fish that walk, fish that talk, fish that fly, fish that climb, fish that bury themselves and fish that are drowned if they stay in the water too long.

By W. Saville-Kent, F.L.S., F.Z.S.

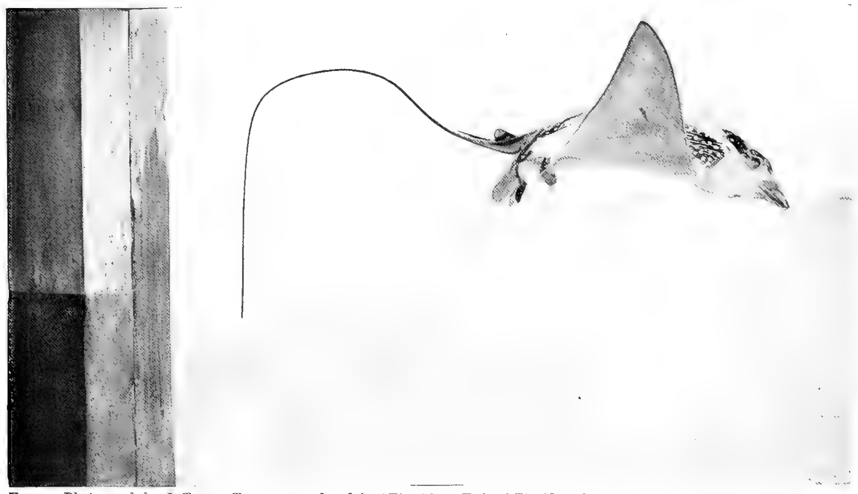
FISHES are generally esteemed to be the least intelligent and least physically accomplished groups of the higher or vertebrated animals, and saddled by these negations to be the least worthy of interest and attention. The class is undoubtedly much maligned in this direction and has a distinct grievance to ventilate. Through a small and select deputation it craves leave in this article to submit evidence that should go some way towards establishing its just claim for more liberal consideration.

To float supinely, scull themselves more or less rapidly through their native element in pursuit of food or to lie recumbent in wait for it at the bottom of the water represents by no means the sum total of piscine attributes. The one brilliant exception to prove the rule that is commonly cited as rising above the dead level of its finny brethren is the well-known flying fish, a modified Herring, with abnormally long wing-like fins. There are, however, other fish not only equally gifted but in which are combined the two unfish-like accomplishments of both flying and walking. The Gurnard Family, of which there are sundry British species, is a notable group with reference to the above diverse talents.

To appreciate the full measure of the liberal endowments of the Gurnard the fish should be seen under its most favourable living conditions. The gaudily tinted wing-like fins correspond in shape and vie in brilliancy with the wings of the gay insects from which the last-named species takes its name. Certain of the tropical Gurnards do moreover rise and skim through the air above the surface of the water with their large painted fins after the manner of the typical flying-fish. Watched a little more closely it will be found that the British species possesses an equally interesting and remarkable accomplishment. A certain number, three on each side, of the bony rays belonging anatomically to the organisation of the wing-like fins are separated off and independently moveable. With their aid the Gurnard literally walks with celerity and ease along the ground in the tank or at the bottom of the sea. It is under these circumstances a veritable hexapod, the insect-like simile previously cited being thus further strengthened. The gift of speech, or at any rate, of uttering audible sounds, has been recorded of various species, and on this account they have been locally named

"Crooners" and "Grunters." It may be reasonably assumed that these vocal sounds vary in their timbre and inflections to such an extent as to be clearly comprehensible to their fellows and to constitute a piscine language.

That certain fish can and do practically maintain intercommunication with their fellows through the medium of vocal sounds has been distinctly ascertained by the writer. This fact was established in connection with members of that quaint group which includes the Sea Horses, Sea Dragons, and Pipe-Fish. Some few years since the writer received a small consignment of Sea Horses from the Mediterranean that were remarkable for their exceptionally brilliant colours. Some of these were bright red, some pink, some yellow, and some nearly white, with many intermediate tints. In order to make coloured sketches of these interesting arrivals, examples were isolated in glass jars and brought to the table to "sit" for their portraits. While the work was well in progress a sharp, though not very powerful, little snapping noise was



From a Photograph by J. Turner-Turner reproduced in "The Giant Fish of Florida" (Pearson)

WHIP RAY.

Jumping out of the sea to shake off suckers which fasten themselves on to the fish.

heard at short and even intervals to proceed from the larger vase on a side table that contained the greater number of the specimens, and these sounds were at once responded to in a similar manner from the receptacle close at hand. Surprise and admiration were intense on discovering that the snappings proceeded from the mouths of the puny and presumably dumb little fish. A close inspection elicited the fact that the sound was produced by consecutive muscular contractions and sudden expansions of the fishes' lower jaw. The phenomenon, and its cause once recognised, was verified by repetitions on several subsequent occasions.

The Sea Horse, in common with the Gurnard, presents multiple points of interest, and on this occasion in a widely divergent direction. It is in association with the Sea Horse and its allies that we meet with the singular phenomenon of the female fish imposing the care of the eggs and infant brood upon her poor hen-pecked partner. There are many species, including the familiar Sticklebacks, in which the male fish

Photos by W. Saville-Kent, F.Z.S.

GURNARDS.

These fish "walk" along the bottom of the sea; they may also be said to "fly," since they are capable of taking long leaps in the air. This composite photograph shows them performing both feats.

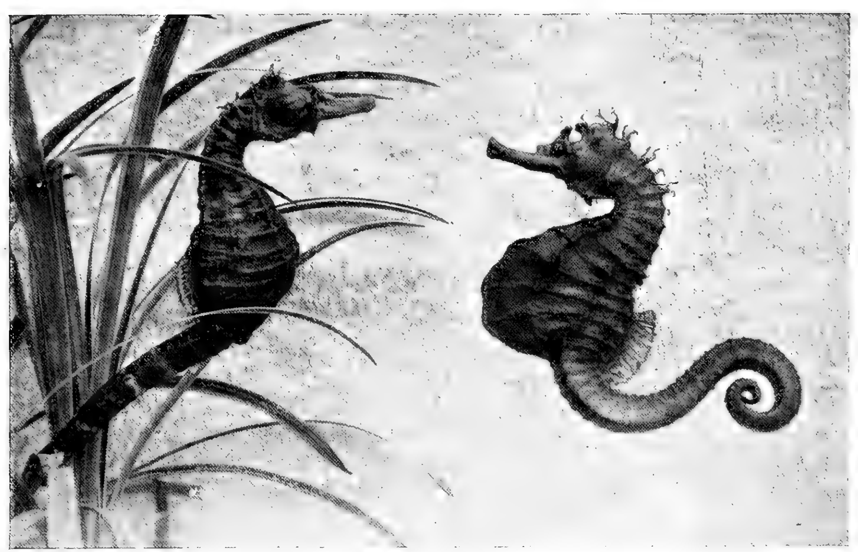


Photo by W. Saville-Kent, F.Z.S.

SEA HORSES.

The fish on the right is the expectant father, who carries the eggs of his spouse in his pouch, and bears the baby brood until they are old enough to look after themselves.

assists the female to build a nest and then mounts guard over and protects the eggs or spawn. The Sea Horse, however, is saddled with a much more arduous task. He cannot snatch so much as a moment's respite from the pains and penalties of paternity, and transformed as it were into a species of peripatetic perambulator, must bear the burden of the eggs and baby-brood to the bitter end. In order to make suitable provision for this paradoxical domestic arrangement that Dame Nature and his lady-love have thrust upon him, the Male Sea Horse has a capacious front pocket-like pouch—analagous to that of the Kangaroo, excepting for the fact that the parent, when once the youngsters have been ousted, takes good care that they never re-enter.

In instances where a male fish acts only as a willing and zealous coadjutator in the task of guarding the eggs and infant brood, it may happen, as the following anecdote bears testimony, that quite a halo of romance may be interwoven with its life history. The particular fish which furnished the writer with the data here recorded was the common little rock-pool frequenting species known as the Smooth Blenny or Shanny. The species rarely exceeds a few inches in length but is remarkable for its intelligent features and agile habits. Not having a swimming-bladder or air-float it can only sustain itself in the water by special muscular effort, and customarily takes up its abode under stones or in some rock crevice, whence it darts out upon its prey or makes excursions in the surrounding neighbourhood. The eggs are laid by the female on the surface of the rock and both fish take a share in the duties of guarding them. The species is commonly kept in aquariums, and quite a number of them were confined in one of the tanks of the large aquarium which formerly existed at Manchester. High up on a narrow ledge of the rock-work of the tank a pair of Blennies decided to establish their home and rear a brood. Attention was first directed to the fact by the unusual commotion at this particular spot, one of the examples being in a

highly excited state and vigorously attacking and driving away with one exception every other fish that approached or attempted to established a foothold (or more correctly "finhold") on the rocky platform. Blennies' eggs, especially "poached" or "scrambled" from a comrade's nursery, were evidently an irresistable *bon bouche*, and hence day in and day out a constant siege with almost ceaseless assaults were waged against the rocky fortress. Some brief intervals of respite were obtained when food at the accustomed feeding hours was distributed among the general commonwealth, and on these occasions the male fish would descend to the bottom of the tank and hurriedly snatching up a morsel would carry it up and place it at the disposal of his lady-love. The gallant little knight held the citadel, though not without the occasional looting of a portion of its pearly treasures, for nearly a month, and then succumbed worn out with fatigue, to the force of numbers. One morning our little hero was found lying dead and mangled at the bottom of the tank, the little eyrie had been mercilessly stripped of every egg and one huge fellow nearly twice the size of its erstwhile valliant defender now occupied the vacated ledge. Such an instance of attachment and gallant devotion to its home and mate has scarcely been previously recorded or so much as suspected of a cold-blooded fish. But, could we peer omnisciently into the sea's profundities, we should doubless find the romance of life still strongly in evidence, and that love as well as hunger represent in the ocean's abyss, as also on the earth, the two all dominating forces.

Photo, W. Saville-Kent, F.Z.S.

BLENNY MOUNTING GUARD OVER ITS MATE'S EGGS.

[The second part of this article will appear in due course. It will contain a great deal of interesting information about animals which have hitherto been little studied.]

W. Saville-Kent

THE LIFE STORY

OF

THE BRIMSTONE BUTTERFLY.

By Fred Enock, F.L.S.

How one of Nature's marvellous transformation scenes takes place, illustrated with a series of wonderful photographs taken by the Author.

One of the very first signs of Spring is the beautiful Brimstone Butterfly, which appears sometimes as early as February or March, but more frequently about the middle of April, when the Cuckoo and Nightingale arrive; and we, who on bright sunny days delight to search for the first open Coltsfoot, are always on the look out for the first Brimstone out from its hybernation. What boy (be his age ten or forty years) can resist being drawn into the chase, on hearing the cry: "A Brimstone! A Brimstone!"

Fig. 1.

Let us endeavour to find out all we can concerning the Brimstone Butterfly. Here is one of the pale females just ahead of us; it seems to be paying much attention to some of the small bushes on the roadside, which look like stripling oaks; we must draw nearer, but not so as to disturb our quarry.

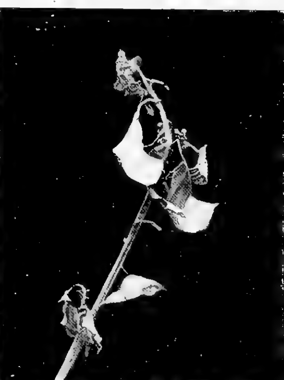


Fig. 2.

There is a good deal of young oak, birch, willow of various kinds, guelder rose, elm and young poplar. The Brimstone appears to favour the oaks, but it is very fastidious in its choice of twigs. Now it is hovering over one; a moment later, and it has settled with its wings over its back, though before we can get near enough to decide what it is doing, it has flown to another bush. Now is the time to steal a march, and we are just in time to see the butterfly settle, and suddenly, twist its body round the corner, and quickly fly off; to return again in a few minutes, and repeat the operation of twisting its body round.

Fig. 3.

At last our eyes are opened; and we realise that the bush is not the oak, but the Buckthorn; the food plant of the larva, and the Brimstone has been carefully selecting the most likely twigs on which she has laid a single egg; on examination of one, we find a long sugar loaf shaped yellowish egg, delicately ribbed and latticed between. These eggs hatch about the end of May, (sometimes earlier or later, according to the weather), and become full fed in June and July, when the larva is about one inch long, and is of a dark green colour above the spiracular line, which is white; the whole body is banded transversely by narrow ribs.

The dark green colour gives the larva a protective resemblance as it rests upon the upper surface of the leaves; quite safe from detection by anyone but an entomologist. Arrived at maturity, it very frequently crawls along the stem on the underside. When it has fixed upon a suitable place, it covers the stem with silken threads from the spinning tube found below the mouth organs. Upon and into this silken platform, it fastens its anal claspers, or "false legs," as they are called. Having now secured a firm hold, it next proceeds to affix its silk to the twig immediately above its true legs in front. The foundation of a minute cable is laid over the third pair; then the cable is drawn out as the larva stretches itself away from the twig; and by a wonderful twist of the body, it brings up the other round and underneath, so making a loose loop, the end being fixed up on to the twig; this girdle is strengthened by a number of strands; the larva then rests, slung up in its silken girdle, in which it remains for some few days *(Fig. 1)*; the shape becomes more bent, until the skin splits at the back of the head, and is gradually cast off toward the tail end; and the translucent chrysalis is evolved. The place of the claspers being taken by some curved hooks, and these hold up the chrysalis at the tail, while the other is slung, and supported by the delicate silken girdle. *(Fig 2.)*

Fig. 4.

Fig. 5.

Those who desire to see the marvellous transformation scene, must be prepared to exercise a considerable amount of patience; but he who keeps such a vigil is amply rewarded. The green colour changes to various shades of yellow as the enclosed nymph is developing into the perfect butterfly. In July or August, we find the chrysalis about to change, and he who means to see the resurrection must wait long hours; and if he desire to try to photograph the transformations he will have to make all things ready for beginning most exciting work. Here are my notes of the accompanying photographs: July 3rd—

Fig. 6.

6.0 a.m.	Rhamnus pupa showing veins on wings.
8.0 ,,	Third segment swelling, (*Fig. 2*).
8.50 ,,	Slight movement; expect it will burst soon.
9.43 ,,	Coming! (*Fig. 3*). Thorax split and front heaving off.
9.43¼ ,,	(*Fig. 4*). Head, eyes, antennae and legs coming.
9.43½ ,,	(,, *5*). Wings swelling out at sides.
9.43¾ ,,	(,, *6*). A moment before freeing itself from pupa.
9.44 ,,	(*Fig. 7*). Out at last!
9.46 ,,	(,, *8*). Wings almost expanded.
9.48 ,,	(,, *9*). Wings fully expanded.
10.0 ,,	(,, *10*). Fully developed. Empty chrysalis.
11.45 ,,	Flew away on to some leaves.

After breakfast. I developed my plates and could then see and note down the gradual but most rapid development of the butterfly; which as soon as the skin split, emerged so fast that I only gave an exposure of one-hundredth of a second for Nos. 3 to 7 inclusive; after these, I gave a little more. The first intimation that I had was seeing the chrysalis split open at the back of the head and under the eyes; the fair hair of the thorax was soon visible, followed by the upheaval of the whole front of the chrysalis (*Fig. 3*), then appeared the antennae, and legs (*Fig. 4*) pushing forward, as the embryo wings exercised a vigorous side pressure right and left (*Fig. 5*), which soon developed into the bursting forth of the legs and antennae, and at the same moment, the body was quickly drawn out (*Fig. 6*), and the new born butterfly hung suspended to the empty chrysalis, which immediately (owing to the elasticity of skin) closed up and looked like a living one (*Fig. 7*), the wing bulging out like a fire balloon being filled. An occasional flap seemed to bring the edges together (*Fig. 8*), and in seven minutes from the time when the chrysalis first split, the butterfly was fully developed (*Fig. 9*), though not ready for flight. When it displayed its face to me, I could not help comparing it to some exquisite coxcomb with hair brushed up over its head in the most perfect manner; not a hair out of place! and the delicate pink tinted antennae, and what I can only term, the absolute perfection of every part both in form and colour, made such an impression upon my mind which I shall never forget (*Fig. 10*). Let me conclude with a quotation:—

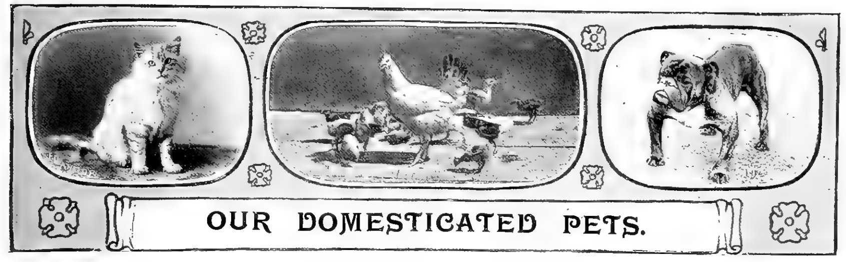
Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

> "Lovely indeed the mimic works of man,
> But Nature's work far lovelier."



OUR DOMESTICATED PETS.

Cats.

The history of the animal world contains no parallel to the rise of the cat in local status. Not so very long ago Puss was regarded as part of the life below stairs; but times are changed. The modern representatives of the feline race occupy a prominent position in the aristocratic world. They are prized for their blue blood. Their pedigrees are traced for generations. They are carefully housed, fed on the best, nursed, waited on and generally treated as if they belonged to a superior race. Fashion of course may have much to do with the apotheosis of the cat, but there is little doubt that merit has won for itself an acknowledgment well deserved.

It is doubtful however whether the general public have any idea of the extent to which cat culture has attained. They know that there are short-haired and long-haired cats and that is about all. Of Chinchillas, and silvers and shaded silvers, of blues and smokes, of creams, and various other classes whose finely drawn qualifications are a standing puzzle to judges themselves, they have but slight acquaintance.

But that the attraction, the fascination we might say, of cat breeding is gradually extending is shown by the increasing number of cat societies not only in England but all the world over. The cat shows, pure and simple, are for the most part held in the autumn and winter, for that is the time when coats and frills are in perfection. The National Cat Club leads off at the Crystal Palace in October. The Cat Club Show at the Westminster Aquarium is in January, but meanwhile there are Brighton and many other smaller exhibitions.

It is noticeable that the custom of exhibiting cats at dog shows is on the increase. The Ladies' Kennel Club admit them at their big show in the Botanic Gardens in June, an event which, if the weather is but propitious, is most enjoyable. The cats themselves may not be in such good coat as earlier, but the kittens just blossoming into the first beauties of feline childhood are bewitching.

We purpose in future numbers to devote some portion of space to the best interests

TWO BLUE KITTENS.

Owned by Miss Kirkpatrick, of Harrow. Their parents were both prize winners.

of our furry friends, not in any way interfering with the journals which chronicle their doings, but to endeavour to secure for them the recognition they deserve by encouraging the study of the numerous varieties, their habits and customs, their vices and virtues, their friends and their enemies.

The pictures here reproduced from photos by Mr. Landor, the well-known cat photographer, will convince even the most hardened sceptic that there are cats to which the kitchen would be an insult. Hitherto the cat was popularly supposed to be an animal unworthy of the friendship of man and fit only for the companionship of old maids; fortunately these silly ideas are dying out, though they die hard as do all false traditions, let us hope the time is passed when cats were the despised and rejected of all domesticated animals.

❧

Two New Books.

"Dog Shows and Doggy People," by Mr. C. H. Lane, F.Z.S. (Hutchinson), is a book which no dog-lover would care to be without. A more entertaining volume it would be hard to find. There are some 250 beautifully reproduced illustrations, mostly from photographs taken specially for the work, and a great many well known people figure in its pages.

Photo by T. Fall, Baker Street.

HER MAJESTY, QUEEN ALEXANDRA,
With her champion "Alix," the Russian Wolf-Hound, and a Toy Pekinese Spaniel.

Added to its many other attractions must be mentioned its cheapness, for, ridiculous as it may sound, the price of the book is only 12s. 6d. We reproduce as specimens of the illustrations photographs of Their Majesties the King and Queen, both with their favourite dogs.

CREAM PERSIAN CATS
Owned by Mrs. Norris, of Kew. These two cats (whose parents were both winners of many prizes) have won first prizes at many shows.

Another book which should certainly be mentioned in the first number of "Animal Life" is "The Giant Fish of Florida," by J. Turner-Turner (Pearson). This is rather in the nature of a guide for sportsmen intending to hunt the big game of the sea. It is illustrated very profusely with some most remarkable photographs of which we reproduce a specimen elsewhere in this number through the courtesy of the publishers.

Photo by Lafayette

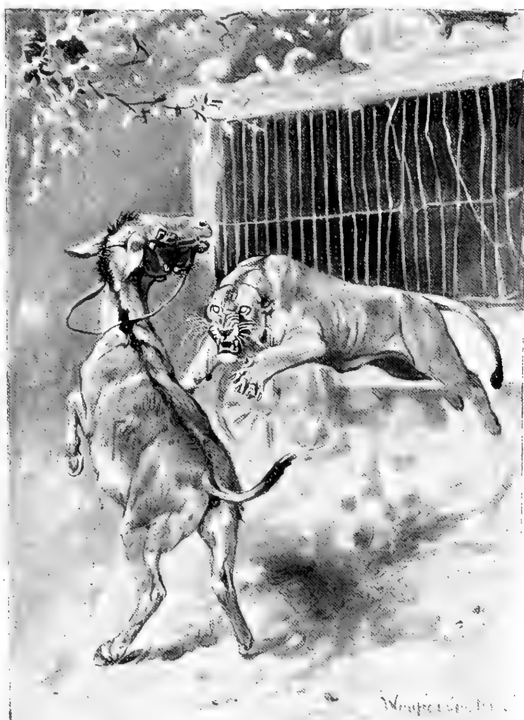
HIS MAJESTY THE KING, AND ONE OF HIS NUMEROUS DOGS

(From "Dog Shows and Doggy People," by C. H. LANE, F.Z.S.)

ANIMAL ANECDOTES.

A Curious Duel.

One of the most exciting fights ever witnessed between two animals took place twenty-seven years ago in America. The combatants were a full-grown lioness and a donkey, and the result of the duel was as unexpected as its beginning was intentional. The affair took place in the early days of the Cincinnati Zoo, when the nucleus for the present collection of animals was made up from specimens secured from half a score of travelling shows. Among the animals purchased was a young, but full-grown, lioness, which, for purposes of convenience, was placed in a half-ruined circus cage, stationed in a brick-covered structure near the entrance of the Zoo. Several hundred workmen were employed about the place, among them several boys who teased and annoyed the few animals then in the enclosure.



"With a roar that shook the frail little building she sprang."

One day a boy astride a donkey, bearing water for the workmen, protruded a long pole into the lioness's cage. Far back in the shadow of the cage the tawny form was crouching. With a roar that shook the frail little building she sprang; and the force of her body's impact sufficed to render asunder the slight metal bars of the cage. She struck the hindquarters of the donkey, bearing him down in the shock of the collision. The boy, rolling in the cloud of dust upraised, escaped. A moment later the donkey had regained his feet and turned to meet the second onslaught of the lioness.

For an instant the lioness crouched; as she sprang again the donkey reared, pawing the air with his steel-shod hoofs, which descended with crushing force on the skull of the lioness. Scores of terror-striken workmen were fleeing for safety, and here and there one, more daring or more foolish than his fellows, had sought refuge in the trees and watched the curious battle of the beasts.

First the lioness, then the donkey, seemed the victor. The donkey fought with teeth and hoofs; the lioness with teeth and claws. The thick hide of the little burro hung in shreds. His blood poured from open ghastly wounds, while the fierce growling of the jungle beast took on a lower note. As the battle progressed the donkey gained courage. He met each onslaught with a brave front, and the watching workmen cheered him cautiously. The fight had gone on scarcely ten minutes when the lioness, vanquished, bruised and torn, slunk away, seeking refuge on a little knoll some distance from the scene of battle. There she lay for an hour, lapping her wounds and lashing her tail, while she glowered at the men in the tree-tops. Finally, an old musket mercifully sent a bullet through her brain.

And Another.

Here is another story of an animal duel which took place only this year between a Pig and a Python, animals whose families are well known to be natural enemies, though it is believed such a battle has never before been witnessed by civilised man. The pig, intended for the pythons dinner, was placed in his cage, and, all unconscious of danger, trotted about until it came in contact with the wriggling tail of the snake. This awoke the python, who at once drew its huge body together into a coil, darted out its long forked tongue and just missed the pig's nose. In an instant all the instincts of its ancestors took possession of the pig who seemed as though transformed into a wild fighting peccary. The long bristles on his back stood up two inches high, and he sprang for his antagonist's head, but the quickness of the serpent eluded his onslaught, and once more getting into position struck again for the pig's nose and again missed. A second time the pig flew at the snake's head, and a second time he missed, but he managed to tear a piece of skin from its throat and thus scored first blood. At last the final round had come. Twisting his tail round a post to give him leverage to crush his enemy the python struck again, and the pig, with desperate courage leapt forward and caught the snake's head in his teeth. As he crunched his tusks through the snake's spine the monster's coils slid round his body and began to crush it. For a moment the pig released his grip, then seized the snake's head once more, and in a spasm of agony as his own ribs were being crushed, sank his teeth into the back of the serpent's brain and bit in two the spinal cord.

From an Instantaneous Photograph

THE PIG THAT FOUGHT A PYTHON.

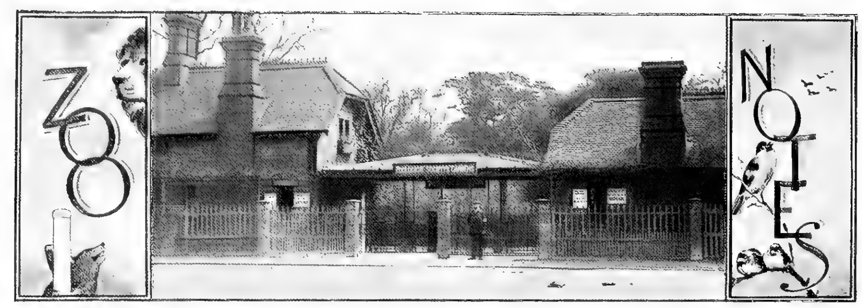
A Cat Story.

Enough of fights for the present, and now for a more peaceful story—one of a domestic cat who always sat up to dinner with his master every evening, and had his napkin round his neck and his own plate with some dainty morsels of fish. He used his paws of course instead of a knife and fork, "but" says his master, "he was very particular and behaved with extraordinary decorum. When he had finished his fish I sometimes gave him a piece of mine. One day he was not to be found when the dinner bell rang, so we began without him. Just as the plates were being put round for entrées, puss came rushing upstairs and sprang into his chair with two mice in his mouth. Before he could be stopped he dropped one mouse on his own plate and then one on to mine. He divided his dinner with me as I divided mine with him. It was an arrangement that appeared to give him every satisfaction."

Fowls.

Domesticated animals are represented in one of our coloured plates this month by a reproduction from an original painting by Mr. Harrison Weir, of a Brahma Pootra, these birds were imported into this country in the year 1852, nine of them being sent as a present to Queen Victoria by Mr. George P. Burnham, under the name of grey-Shanghia.

Mr. Weir, whose name is familiar to all animal lovers, has been busy for many years past on a great work dealing with Poultry, this is nearly ready for publication and will be issued in fortnightly parts. It will be illustrated with many beautiful coloured plates and a large number of original drawings.

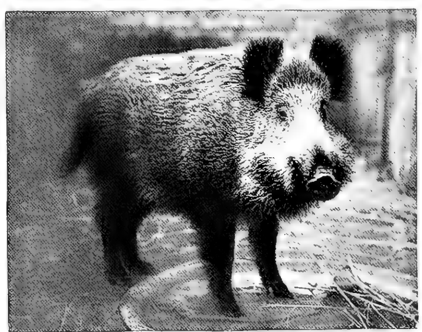


[Described and Illustrated (with Photographs) by W. P. Dando, F.Z.S.]

Indian Wild Swine.

It is very gratifying to be able to record as "Born in the Menagerie" five wild swine, and again to prove the care and attention bestowed upon the animals at the Zoo. When the King gave up the herd of wild swine kept at Windsor, and deposited a pair at the Society's Gardens, some thought the strain might die out, but on the contrary, it is possible that any number may be reckoned upon, as the litter of five shown in the photograph is possible twice a year, and with this litter at maturity, the numbers can be imagined. Closely allied to its European cousin, the Indian Wild Swine is a slightly taller animal, and has a crest or mane of long black bristles running from the nape of the neck along the back. The boars weigh about 270 lbs., and in their natural state are very ferocious. It will be noticed that the little pigs are very curiously marked with stripes and many visitors have enquired if they are really the young of the pair with them. All wild swine with, I believe, but one exception (the Celebese Pig) are marked lengthwise with stripes when born, and curious to relate, although domesticated pigs show no signs of these markings, when they revert to the wild state (as they have done in South America and parts of Africa) the young are generally striped when born. In their wild state, sows and their young will associate in "sounders" or droves of about a dozen, leaving the old boars in their lair. They are very savage if "cornered" and will make a rush at anything, either men, horses or even elephants even in spite of being severely wounded.

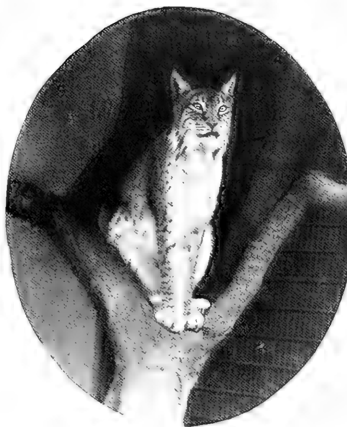
THE WILD SOW AND HER LITTER.



THE FATHER OF THE FAMILY.

When Wild Boars were kept at Windsor, two boys from Eton College thought they would like to raid them, and each armed with a

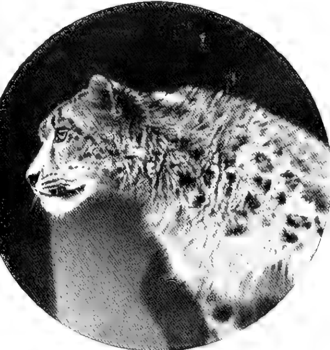
kind of javelin which they no doubt made themselves, speared and killed one. For some little time the identity of the culprits was a mystery, but the boys acknowledged to the Head Master their Wild Boar Hunt, which he duly reported to the late Queen, who graciously refused to hear of their being punished, and even declared she was proud of such brave boys. Subsequent events proved that the Queen was justified in her estimation of the courage of these boys, for they have been hunting Boers in South Africa, where one of the brave fellows has given his life for his country.



THE LATE LAMENTED LYNX.

The late lamented Lynx.

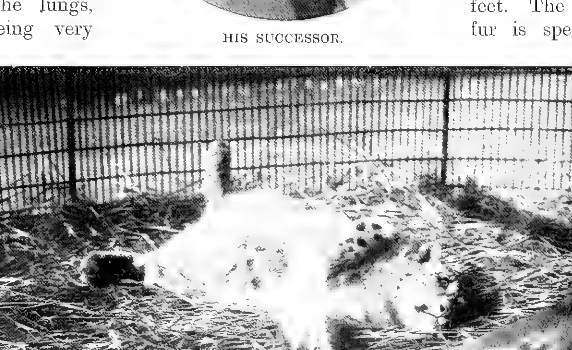
"TOMMY" the late pet of the Small Mammals House, where he had been greatly admired and petted for over six years, has died of inflamation of the lungs, "draughts" being very prevalent in this corner of the Gardens. He was a very affectionate creature to those who knew him, but he would not recognize any attempt at endearment from children, not that he was spiteful, he simply ignored them. He had beautifully bright eyes, and his coat of fur was perhaps the softest and loveliest of any animal in the Zoo.



HIS SUCCESSOR.

His Successor.

"JIM," the Snow Leopard (or "Ounce") who replaces the lynx, I at first thought would prove equally docile and affectionate, but although quiet, his nature is entirely different, and one cannot well trust oneself in his cage now, although soon after his first arrival I took some photos of him from the inside, but his character seems to have changed since he has been at the Zoo. The habits of these animals, who live in summer on the mountain ranges of Ladakh, at a height of between 18,000 and 20,000 feet, makes any reliable knowledge somewhat limited, and they never descend below a level of some 9,000 feet. The length of the fur is specially adapted for protection against the severe weather of the regions it inhabits, and the beauty of the skin in winter when they descend to lower altitudes, and are easier to capture, is unrivalled, as one that I have in my



ANOTHER VIEW.

possession proves. Unfortunately the skins of these animals are likely to become in great demand owing to the fact that the Viceroy of India has sanctioned their use by the officers of a native regiment, so that it is quite possible that before long this beautiful creature will have to be reckoned among the great army of extinct mammals.

In the Monkey House

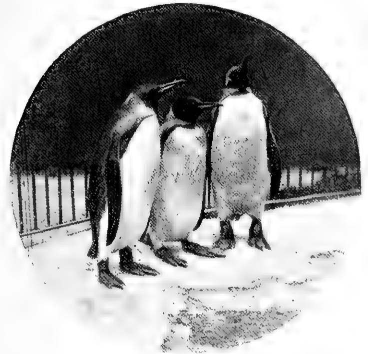
THE Arabian or Sacred Baboon was known thousands of years B.C., and that it was worshipped, and even sculptured as representing the god "Thort, Lord of Letters" himself, ancient mummies and relics go to prove, and they all give him the sitting position shown in the photographs. Although this genus is considered the lowest in capacity and intelligence, and an untractable, malicious, and ferocious animal, we see them in very ancient bas-reliefs represented as gathering fruit on the high branches of trees, and handing it down to their masters. The heavy mantle of fur on the shoulders of the large monkeys represented on the obelisks which Sir Henry Leyard brought from Nimroud are intended for the Arabian Baboon. In their natural state they go about in tribes numbering about 200, headed by an old male with a very prominent mantle, and he seems to do the scouting and warns the tribe of any approaching danger.

THE ARABIAN BABOON

Companions for the King Penguin

I HAVE not observed anyone fail to laugh, on seeing the King Penguin for the first time, and the comical manners of "Kingie" when its keeper is about is a great source of pleasure to the visitors. Until a week or two ago "Kingie" was the only King Penguin in the gardens, but thanks again to the Hon. Walter Rothschild, two more King and a thick-billed variety have been deposited. They arrived at Regents Park on April 18th, and were brought over from New Zealand where they had been temporally landed by a vessel that goes every three years to the Antarctic Seas, and generally manages to capture one or two Penguins. As a remaining example of the flightless birds, the King Penguin is the largest of the family (*Spheniscidae*). The wings are useless for flight and their legs still more awkwardly adapted for walking, for nothing appears but two short legs, or as some may call them feet, that seem stuck into the rump, forming a very awkward support for the animal. They always give the impression when sitting or walking, of a performing dog that has been taught to walk on his hind legs, and draws the body in progression from side to side. Like men they walk erect, and their fin-like wings hang down like arms, giving them the appearance from a distance of so many children wearing white aprons. That great naturalist, the late Mr. G. Bennett, made special observation of the habits of the

Patagonian or King Penguin, which he met in various islands of the high Southern Latitudes, and described in the Zoological Proceedings for 1835. "A colony of these birds covers an extent of 30 or 40 acres, and their numbers it is almost impossible to guess at with any near approach to truth, as, during the whole of the day and night, 30,000 or 40,000 of them are constantly landing, and an equal number going to sea. They are arranged when on shore, in as compact a manner and in as regular ranks as a regiment of soldiers, and are classed with the greatest order, the young birds being in one situation, the moulting birds in another, the setting hens in a third, and the clean birds in a fourth, &c.; and so strictly do birds in similar condition congregate, that should a bird that is moulting intrude itself among those that are clean, it is immediately ejected from among them."

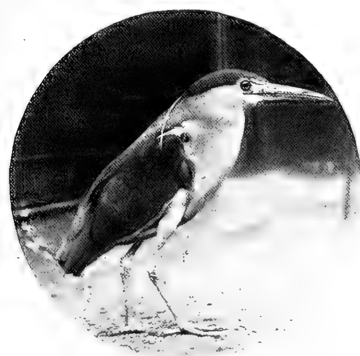


THE OLD KING PENGUIN AND HIS NEW COMPANIONS.

THE THICK-BILLED PENGUIN.

Yellow-billed Duck.

THE beautifully marked "Geelbec" of South Africa, is the common duck of the country, and is abundantly found all over the south. Migratory in its habits, and usually seen in pairs, it exhibits all the wariness and caution of its race. We are told that once a year the farmers of the Vogel Vley, where they breed in considerable abundance, assemble for a grand hunt after these birds. The shooters are posted at different parts of the long sheet of water hidden among the rushes; men are then sent along with long waggon whips (the crack of which is nearly equal to a gun), and the wretched birds fly backwards and forwards, having no other water for many miles, and as they pass the ambushes, are shot down, and the day's butchery usually fills many sacks.



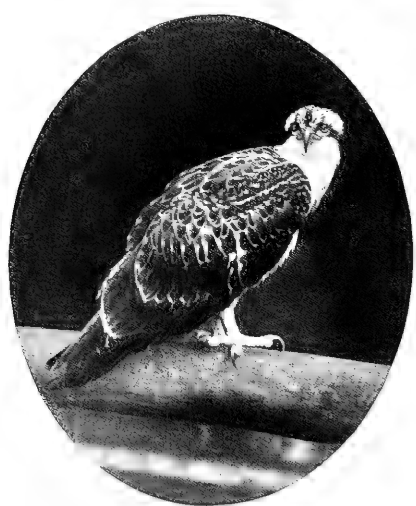
NANKEEN NIGHT HERON.

THE YELLOW-BILLED DUCK

Nankeen Night Heron.

Presented to the Society by John Brinsmead, Esq., the Nankeen Night Heron is no doubt a very rare and beautiful specimen of the *Nycticorax cullatus*, and was, I believe, sent from Australia by his daughter. In their wild state, they seldom disturb themselves from their slumbers in the daytime, and even the one in captivity, remains immobile for a considerable time generally perched on one leg, the only sign of life being the blinking of its beautiful eyes (which are always wide open) at long intervals, and it is perfectly heedless of the movements of the other birds caged with it.

THE CAPE HUNTING DOG.



THE OSPREY.

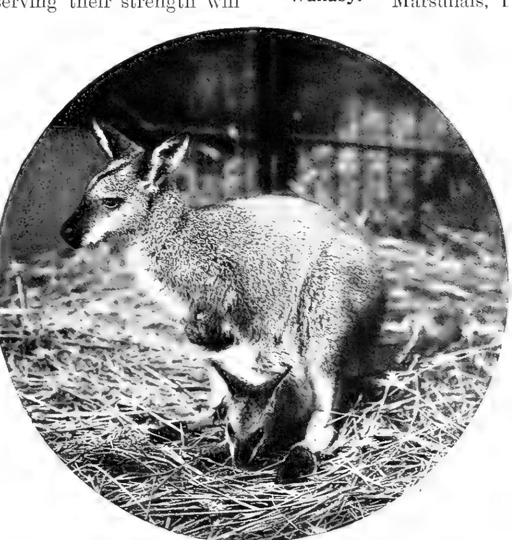
A Brief Visit.

"Here to-day and gone to-morrow" may be well applied to some of the fresh arrivals at the Zoo. The Osprey shown was a very fine specimen "caught at sea," and had on arrival a plumage scarcely ruffled. Hearing of its arrival I hastened to obtain a picture, having had a hint that "they never live long here." True enough the poor bird in a very few days became almost unrecognisable as the beautiful bird shown. The Osprey used formerly to breed in the British Isles, chiefly in Scotland, by the shores of wooded mountain lakes, where it fishes by descending from great heights above the water and precipitating itself, and seizing with its claws the fish it has observed on the surface. This mode of living has given it the name of the Fishing Hawk.

TWO OF THE WILD HORSES, WORTH £500 THE PAIR.

The Cape Hunting Dog.

THE "Vilde-honden" of the Boers was called by last century naturalists by the very appropriate name of Hunting Hyæna, it is the dread of the sheep farmers, for not content with making a meal off the sheep, they will rip open, tear, and mangle, fifty more than they can devour. These pests are about the size of a large Dalmatian Dog, their coat is yellowish grey, strangely marked (without any symmetry) with splashes of black, principally upon the legs. They go in packs of about twenty, and hunt down their prey in relays; part of the pack will make the running, and when the leaders are tired out, they will fall back, and the others who have been reserving their strength will come up and relieve them. The restlessness of the ones at the Zoo, when not curled up on the piece of old sacking, has cost photographers many dozens of plates, and it was only after many weary attempts that I was even able to obtain the poor result shown, which however I believe is the only one ever taken.



THE WALLABY AND HER YOUNG.

Prjevalsky's Wild Horses.

THESE diminutive horses were first discovered by the celebrated Russian traveller after whom they are named, but until the present time no specimens had been sent to England, and they were practically unknown to naturalists. Those now exhibited were captured at the same time as the 12 possessed by the Duke of Bedford, and two have been forwarded from the Zoo to the Hon. Walter Rothschild. They were all brought to England by the well-known dealer, Carl Hargenbeck, who it is stated employed a whole tribe of men numbering over a thousand to capture them in Western Mongolia. Some disappointment has been expressed by visitors at the appearance of these "wild" horses, especially when it has been recorded that each specimen cost £250. In appearance they have been likened to a Shetland pony, and although they have only been here a short time they are getting quite tame, and feed out of the hand.

Rufour Necked Wallaby.

THE breeding of the Wallabys at the Zoo seems to go apace, and the Marsulials, I believe, hold the record for animals "Born in the Menagerie." The ruficollic variety showing the young one's head protruding from the pouch is interesting as the latest addition to the Zoo. How the young are placed in the pouch after their premature birth I cannot find any testimony, and as far as the keepers at the Zoo are concerned none of them know how or when transition takes place.

NOTES AND COMMENTS.

The Okapi.

OF the two coloured plates included in this number we are indebted to Sir Harry Johnston for permission to reproduce in *fac simile* his painting of the Okapi, which appears in his work "The Uganda Protectorate," a book which can be heartily recommended to all lovers of nature as well as to those who are interested in Politics, Geography, Languages and History. These two handsome volumes are an eloquent tribute to the versatility of their author. A most interesting account of his search for this newly discovered mammal was given by Sir Harry in "The Living Animals of the world," and will also be found in the chapter on the Zoology of the Uganda Protectorate in his new work, so that it need not be repeated here, but the following facts may perhaps be new to some of our readers. The various drawings of the okapi done by Sir Harry Johnston were made from the mounted skin and other data, but the coloured drawing was, in the main, done in Africa from the skin, whilst this was fresh and still retained some indication of the animal's form. The colours of the hair were brighter before the skin made its journey to London.

The size of the okapi is that of a large stag. Its coloration is quite extraordinary: the cheeks and jaws are yellowish white, contrasting abruptly with the dark-coloured neck. The forehead is a deep red chestnut; the large broad ears are of the same tint, fringed, however, with jet black. The forehead ranges between vinous red and black in tint, and a black line follows the bridge of the nose down to the nostrils. The muzzle is sepia coloured, but there is a faint rim or moustache of reddish yellow hair round the upper lip. The neck, shoulders, barrel, and back range in tone from sepia and jet black to rich vinous red. The belly is blackish, except just under the knees. The tail is bright chestnut red, with a small black tuft. The hindquarters, hind and fore legs are either snowy white or pale cream-colour, touched here and there with orange. They are boldly marked, however, with purple-black stripes and splodges, which give that zebra-like appearance to the limbs of the okapi that caused the first imperfect account of it to indicate the discovery of a new striped horse. The soft parts of the animal being as yet unknown, it cannot be stated positively that the okapi possesses a prehensile tongue like the giraffe, but it is probably by the lips and tongue that the creature gathers the leaves on which it feeds, for according to the accounts of the natives it lives entirely on foliage and small twigs. Like all living runiments (except the camel) it has no front teeth in the upper jaw.

HEAD OF THE OKAPI.
Front and side views from the original drawing by Sir Harry Johnston reproduced in "The Uganda Protectorate."

"So far as is yet known," says Sir Harry, "the existing range of the okapi is confined to the northern part of the

Congo forest, near the Semliki River. The okapi is found in the little territory of Mboga, which is an outlying portion of the Uganda Protectorate. It is also found in the adjoining province of the Congo Free State. This same forest, I believe, conceals other wonders besides the okapi, not yet brought to light, including enormous gorillas. I have seen photographs of these huge apes, taken from dead animals which have been killed by the natives and brought in to the Belgians. A careful search might reveal several other strange additions to the world's mammalian fauna."

From a Photograph.

THE BABOON AT UITENHAGE WORKING THE RAILWAY SIGNALS.

Since Sir Harry Johnston's book went to press, very interesting further discoveries have been made by the Belgians in the northern parts of the Congo Free State. A more or less complete skeleton has been secured, and also another skin, these have been examined at Brussels by zoological experts and the result is a remarkable confirmation of Sir Harry's original opinions, which were not always shared by our museum authorities. It is also said that ten living okapis are now on their way down to the Congo for despatch to King Leopold at Brussels. The specimens now under examination, together with the living ones, all come from the Mangbettu country, where the okapi is said to exist in large numbers, and goes about in small herds.

A Useful Baboon.

In the first number of "The Living Animals of the World" a story was told of a baboon who worked the railway signals at a station up country in Cape Colony. Thanks to Mr. G. E. Fuller we are fortunate enough to be able to give in the first number of "Animal Life," a photograph of this interesting animal, and also a few further particulars. Uitenhage the station in question is about 23 miles from Port Elizabeth, and Wylde, the signalman, trained the baboon to such perfection that he was able to sit in his cabin stuffing birds, etc., while the animal, who was chained up outside, pulled all the levers and points either for the Graaff Reinet or Port Elizabeth trains, the signalman having certain words and signs to denote which lever he was to pull. At the edge of the

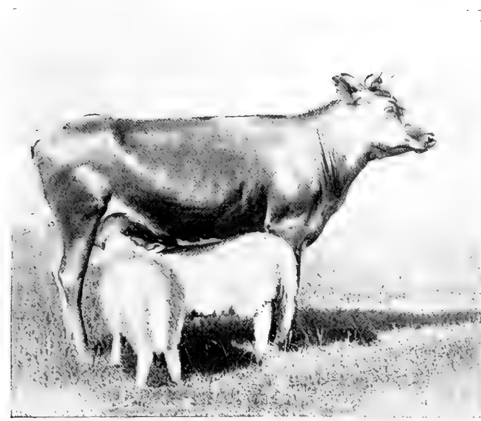
platform in the photograph a small trolley will be noticed, this is the one in which Wylde travelled to and from his house (known as the Three-quarter Mile Cottage). As soon as the last train at night had gone he and the baboon used to fix the trolley on the rails and Wylde sat upon it with his wooden legs pointing the way the trolley was to travel. He then took the end of the chain attached to the baboon's collar and off they started. "I noticed," writes Mr. Fuller, "that the baboon never started the trolley pulling with its collar but used to grip the chain and run on three legs until the trolley got into a good swing. It was very fond of Boer brandy and tobacco, in fact it would get beastly drunk. If ever it broke away it never associated with the other baboons outside the town, this being brought in from some distance, and they seem very clanish."

From a Photograph.
A NEST OF SPECTACLES MADE BY A CROW.

A Crow's Curious Nest.

MESSRS. LAWRENCE & MAYO, of Bombay, have been good enough to send us the photograph we reproduce on this page of a curious nest made by a crow. The following is the history connected with it. At Messrs. Lawrence and Mayo's factory for the manufacture of spectacles, a good deal of annoyance was caused by the mysterious disappearance of gold, silver, and steel spectacle frames which daily disappeared as soon as made in a manner which defied all human ingenuity employed to trace the thief. These frames were manufactured in a special room appropriated for the purpose, which had only one window. Near the window was placed a small table, on which the spectacle-frames, as soon as made, were arranged in order. The room was accessible during the day to other employés, but the chief workman in charge of it, for the greater part of each day, was the assistant to the manager, who as much as any one, was at a loss to account for the mysterious disappearance. On reporting the matter to his manager, the access of all other persons to the room except the assistant was prevented, but still the spectacle frames continued to disappear, not one or two, but fifteen or twenty a day. In less than four days, eighty-four gold, silver, and steel frames, of the value of about Rs. 500 had vanished. The mystery baffled the utmost ingenuity of the establishment to unravel it. On the fourth day however, the manager's assistant was at work alone when his eyes suddenly fell upon a crow which picked up a spectacle frame from the table and flew away. Considerable relief at the discovery of the thief was experienced by everyone. But how was the stolen property to be recovered? It was suggested that another spectacle frame should be placed upon the table, and arrangements made to watch the direction in which the thief flew away. It proved to be a happy idea. The crow came again to the table, picked up the frame, and flew away to add it to the framework of its nest. This was being constructed, rather artistically for a crow, in a corner of the roof of a building in the same street. The assistant of Messrs. Lawrence and Mayo, after obtaining the necessary permission, visited the crow's nest, of which he secured a photograph before applying his hands to it. He found it stuffed with the eighty-four stolen spectacle frames, which were all uninjured.

From a Photograph.
A HEDGEHOG AND HER FAMILY.



From a Photograph.

A COW THAT WAS FOSTER MOTHER TO TWO LAMBS.

A Domestic Scene.

ON page 38 is a little photograph (by Miss C. Percival-Wiseman) of a mother hedgehog and her family of four piglings. In their wild state the nest made by the parents is a really wonderful piece of construction. Ivy leaves, beech leaves, nettle stems, dead grass, and other vegetable matter are collected together and made into a home which proves quite impervious to all inclemencies of weather. A litter of young hedgehogs consists generally of about four, when first born their spines are white and soft, but when about a fortnight old the young ones are nearly as spiky as their mother. The quills are then brown, sharp, and closely set.

Foster Mother.

A SPECIAL interest attaches to the question of foster mothers in the animal world, from the legend of Romulus and Remus downwards. A story, which is perfectly true, is told of a sheep dog who when deprived of her pups went to the meadow and brought to her domicile a lamb, which she was found suckling. The owner returned the lamb to its mother of course. But the dog again fetched that particular lamb from the flock. Again it was returned. Three times this was repeated, when the owner resolved not to interfere further, and the dog reared the lamb. The picture we give in this connection is from a photograph taken on a New Zealand sheep farm. The heifer has lost her calf, and the lambs their mother. Each is accommodated by a mutually agreeable arrangement as here seen.

From India.

THE photograph of the Snake Charmers has been sent to us by Sir Joseph Fayrer, F.R.S. (Vice-President of the Zoological Society) whose son, Captain F. D. S. Fayrer, I.M.S., took it at Bangalore. The centre basket contains two cobras, and a rock snake is coming out of the basket on the right;

From a Photograph.

SNAKE CHARMERS AT BANGALORE.

a mongoose can be seen near the centre basket held by a string. The cobras are very large and beautifully marked, they were very lively too, and constantly striking at the man, but of course their fangs had been drawn.

A Goat that is not a Goat.

THIS photograph of a Rocky Mountain Goat was sent to us by Mr. Robert D. Carson for insertion in "The Living Animals of the World," but as it arrived too late for that purpose we give it here. It is believed that only two of these animals have ever been exhibited in Zoological Gardens, one is in Regent's Park and the other at Philadelphia.

The animal is a goat only in name, its affinities being with the Antelopes. It is larger than a sheep, old males weighing fully 300 pounds, and has a long, solemn face, a shaggy white coat, and slender polished black horns which suggest those of the Chamois. Its home is among the crags, snow-banks and glaciers of the lofty mountains of the north-west, far above the regions in which most animals live. In such surroundings its range extends from the Rocky Mountains in Idaho and the Cascades in Washington northward through British Columbia and the coast ranges of Alaska to Kenai Peninsula. But the rugged peaks it inhabits, bleak and barren as they are in stormy weather, are not wholly inhospitable, for in summer the little hollows among the rocks are carpeted with flowering heathers and other beautiful alpine plants, and are sought as nesting-places by the ptarmigan, titlark and other birds. The Mountain Goat is rather a stupid beast, and where not often disturbed is easily approached, especially from above. His enemies, aside from man, are few. In summer, in the southern part of his range, he is said to be hunted by both the grizzly bear and the mountain lion, and in the northern part by the big brown bears of Alaska; but it is not likely that such heavy and clumsy animals as bears can catch such natural-born rock climbers as goats, unless suddenly surprised or cornered in some place from which there is no possible escape.

From a Photograph.

A YOUNG MALE ROCKY MOUNTAIN GOAT.

THE DEATH'S HEAD HAWK MOTH.

CATERPILLAR AND PUPA.

From an original water-c[illegible]r drawing by Professor F. E. Hulme, F.L.S., F.S.A.

WILD BEASTS AND THEIR WAYS.

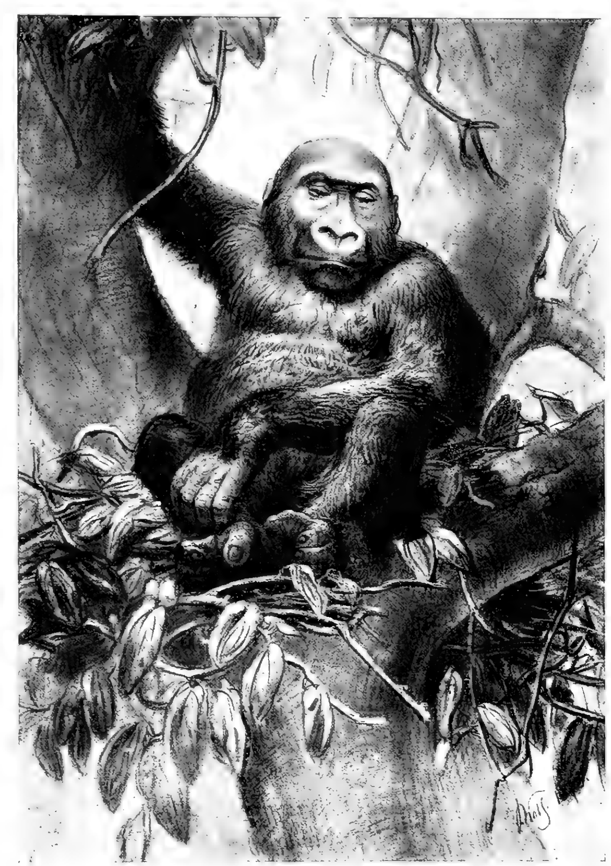
The first of a series of articles on popular Zoology.

By Sir Harry Johnston, G.C.M.G., K.C.B., D.Sc.

I. THE GREAT APES.

IT has occurred to me that there are some points connected with the habits and peculiarities of African wild beasts that are not generally known or understood, and might therefore be of interest to the readers of this Magazine.

The anthropoid or man-like apes are represented in Tropical Africa at the present day by two genera, *Gorilla* and *Anthropopithecus*. The first named contains one species, the well-known gorilla; and the second comprehends the two or three different kinds of chimpanzees. Perhaps on the whole the gorilla is slightly nearer to the human family than is the chimpanzee. Its feet approximate more to the shape, structure, and relative length of the human foot; its cranial capacity is slightly greater than in the last named ape, and the nose exhibits a recognisable bridge with a distinct tip at the end, whereas in the chimpanzee there is often a depression at the end of the nose between the two largely developed *alae* or nostrils. The gorilla leads a more terrestrial life than the chimpanzee. This enormous ape (of which specimens have been found at the back of the Cameroons reaching to 5 feet 6 inches in height, with an extraordinary chest measurement, and weighing perhaps as much as 17 stone) is obviously less likely than the chimpanzee to trust his heavy body to the doubtful support of a branch, a fall from which



FEMALE GORILLA.
From the original drawing by J. Wolf in the possession of the Zoological Society, here reproduced by special permission for the first time.

at any considerable height from the ground must of necessity mean death. Yet from a number of other indications it is obvious that in the case of the gorilla (whose evolution is now rapidly nearing an end since the conquest of the Congo Forests by man will mean his inevitable extinction) there has been going on for the last few thousand years a return from an arboreal mode of life towards existence on the ground, which, in the case of all anthropoid apes and man, was the universal mode of existence at what might be termed the "baboon" stage of their common evolution. My own humble opinion is that when mankind developed from a genus of apes of the parent stock that gave rise to the gibbons, the *Dryopithecus*, the orang, the chimpanzee, and the gorilla, he was a terrestrial animal, and had been so for a long time. The baboons are, I am convinced, but slightly divergent from creatures that formed an actual stage in man's upward career, a stage higher than the preceding long-tailed monkeys and lower than the tailless ape, and the baboons have, to a great extent, left the trees and made their home in preference among the rocks and crags. Therefore we may with some probability assume that all the anthropoid apes in their earliest types were frequenters of the ground rather than of the trees, the progenitors of man becoming especially terrestrial. The rapid predominance which man attained at the end of the Tertiary Epoch was probably one of the principal agencies for the extermination of many allied and intermediate species of anthropoid apes, and the cause which drove those four genera that survived (the gibbon, the orang, the gorilla, and the chimpanzee) to an arboreal life amidst the densest forest. Where these creatures attempted rivalry with their successful cousin in the open they were ruthlessly exterminated. But in the dense forests of West Central Africa, man, as represented by the Congo Pygmies, was a poor and degenerate rival of the great anthropoid apes, and before the advent of superior types of negroes with weapons of real deadliness the gorilla, at any rate, had nothing to fear from contact with humanity. As therefore he grew bulkier and stronger, he left the exclusive life among the trees for a greater frequentation of the ground. He still had to remain in the forest, however; partly because it was there only that he could find abundant food, and partly because the negro tribes in the open could have easily exterminated him by their greater rapidity of movement and superior intelligence. Had man, however, never invaded the Congo Forest with stronger representatives than the Pygmies, we might in time have seen the gorilla develop into a hideous caricature of humanity, acquiring eventually colossal, elephant-like hind limbs which would have been strong enough to support in an erect position the huge, mis-shapen trunk.

THE LARGEST GORILLA EVER CAPTURED.

This photograph, reproduced by permission of Herr Umlauff in "The Living Animals of the World," is repeated here at the request of Sir Harry Johnston.

I see that it is still stated in the latest works on mammalia in the English language (such as that excellent volume by Mr. Beddard, in the Cambridge Natural History Series) that the present range of the gorilla is confined to the forests of the West African coastlands between the Cameroons River on the north and the vicinity of the Congo on the south. This is erroneous. German explorers have shown that gorillas

From a Photograph by Sir Harry Johnston.

A UGANDA CHIMPANZEE.

of enormous size exist in the forest on the watershed between the northern affluents of the Congo and the sources of the rivers flowing towards the Cameroons coast. The gorilla has been credibly reported to exist in the forest country between the great Mubangi-Welle River and the northern bend of the Congo. Lastly, I have myself seen photographs of gorillas taken by Belgian officers who had killed them near the Stanley Falls, on the Upper Congo, and in the Ituri Forests (at Avakubi, for instance), not more than from two or three days' to a week's march from the Semliki River and the Uganda frontier. Besides these photographs (one of which, I believe, was published in a book by Captain Guy Burrows), skulls of these gorillas were sent from the districts in question to Brussels, and are now in the Congo State Museum at that place.

The hair of the gorilla turns grey apparently much more than is the case with the chimpanzee. All old gorillas of both sexes (but especially in the male) seem gradually to become iron-grey and then almost whitish-grey—at any rate from the scalp of the head downwards over the back—when they are in advanced middle age (which we might guess to be equivalent to 30 years). Our information as to the length of life on the part of the great anthropoids is very scanty. In captivity, no anthropoid ape has been known, I believe, to reach to more than fifteen years beyond the age at

From a Photograph.

YOUNG CHIMPANZEE.

This and the following photographs were specially taken to illustrate this article by Mr. W. P. Dando, F.Z.S., under the supervision of the author.

which it was captured, which would perhaps give 20 years as the maximum age attained in captivity. From such slight information, however, as may be collected from the more intelligent negroes of the Congo Forest and the Gaboon, local information would seem to indicate that on the part of the gorilla, 30 years of age is equivalent to about 55 on the part of a man, and 50 years to the most advanced old age attained as yet in the human species. The extreme limit of age in the chimpanzee is probably a little less.

From a Photograph.

WEST AFRICAN CHIMPANZEE.

Notice the position of the right hand, which is that taken by the animal when walking on all fours.

The gorilla, when young, is easily tamed, but the few specimens which have been kept in captivity seem to be invariably sulky and miserable, and have never lived very long after capture. On the other hand the chimpanzee is probably tameable until three-quarters grown, while very young chimpanzees would probably be quite at home with their human captors in a week. Once tamed they are as happy as possible unless overtaken by illness. The chimpanzee becomes deeply attached to its guardian or master, and will readily make friends as a rule with people that are kind to it. It will also take sudden fancies to human beings it has never seen before, and voluntarily tender affectionate advances. I have had half-grown chimpanzees in my keeping from a day or two after their capture and have found it possible to get into relations with them (so to speak) within a week of their having been made prisoners. At this period I have generally managed to caress them without running much risk of being bitten or "boxed." Chimpanzees in Africa after their capture will often attempt to rush at a human visitor with the idea of seizing him with the hand, carrying the portion seized up to their teeth, biting, and then pushing the limb from them. But they will also not attempt to use their teeth, delivering instead swinging, overhand blows—backhanders almost—with the knuckles of the half-closed fist. One rather large chimpanzee that I kept in Uganda never seemed to attempt to bite any creature that came near it, either human, monkey, or dog, but always dealt these swinging blows with the knuckles. In the case of the chimpanzee, however,

there is an enormous deal of bluster in the attack, which rapidly turns to a whimpering retreat if boldly met. A person who thus stands his ground and turns on his chimpanzee aggressor—delivering smart boxes on its ears or slaps on its back—will soon find that he has a whimpering, hunched-up creature before him, crying like a child, and actually not attempting to bite or scratch its castigator. Once friends with any human being the chimpanzee would be the most delightful pet in the world if its habits were not so uncleanly. It is far less mischievous than the baboon or monkey, and can be very quickly taught everything connected with good behaviour but cleanly habits. Failure in this direction was the only thing which blighted my success with a charming chimpanzee that I once kept in the Vice-Consulate at the Cameroons. I might safely trust this creature in my drawing room; he would never think of taking up unbidden a teacup or glass or plate; but, alas! he could never be got to understand the requirements of civilization under the head of what is politely termed "sanitary arrangements."

From a Photograph.

From a Photograph.

YOUNG CHIMPANZEES.

From a Photograph.

YOUNG CHIMPANZEE.

Anyone who visits the Zoological Gardens may satisfy himself that the chimpanzee can laugh with an almost human cachinnation. They can also cry like a human being and shriek like a human baby; but it is a curious thing that I have never noticed amid all the passionate, hysterical outbursts of baboons and apes any tears trickling from the eyes. They would appear to weep dry-eyed. I would not, however, like to dogmatise on this point. Curiously enough, the very young gorilla does not bear the same startling resemblance to the human baby as is borne by the chimpanzee.

From a Photograph.

A YOUNG ORANG.

The geographical range of the chimpanzee in Africa, even at the present day, is more considerable than is generally set forth in books of natural history. It is found in true West Africa, in the forest region to the south of Sierra Leone, and also at the back of the Ivory Coast. It reappears again in the forests of Southern Nigeria, and thence northwards to the vicinity of the Benue, and from this river extends almost uninterruptedly southwards and eastwards to the Congo. The chimpanzee is found nearly throughout the Congo basin, except in the more or less thickly inhabited regions to the south of the river Congo. It was formerly found in parts of Angola, but appears to be nearly extinct in that Portuguese colony at the present day. Chimpanzees are also reported from the forest regions at the sources of the main Zambezi. They are still met with right across the southern basin of the Congo to the vicinity of Lake Tanganyika. Schweinfurth and Emin Pasha discovered that the chimpanzee was found within the watershed of the Nile, in that region known as the Bahr-el-Ghazal. Emin Pasha also asserted that the chimpanzee was met with in Unyoro, to the east of Lake Albert Nyanza. The present writer was able to confirm this statement by obtaining living and dead chimpanzees from that district. He also found that the chimpanzee existed in Toro and parts of Ankole, in fact, on the verge of the Kingdom of Uganda proper. In the Luganda language a name exists for the chimpanzee, and the natives have a tradition that this ape was found until quite recently in the Forest of Kiagwe, close to the Victoria Nile. Other traditions would appear to indicate its recent existence on the western slopes of Mount Elgon. It was also asserted at one time that natives of lands in the

From a Photograph.

A YOUNG ORANG.

The Orang comes much nearer to human nakedness than the more hairy African Apes.

southern dominions of Abyssinia had stories or legends which appeared to refer to the chimpanzee. As we now know that the chimpanzee existed ages ago in north-western India, it is probable that this ape originated in that part of Asia and thence spread, together with the closely allied gorilla, right across the once well-forested Arabia into Equatorial Africa. The gorilla indeed may have diverged from the chimpanzee after this older form of ape reached the African forests in flight before its successful rival, man.

At the present day natives and Europeans frequently report seeing chimpanzees and gorillas in close proximity, and it has been pointed out by zoologists that several supposed distinct species of chimpanzee may be really hybrids between that animal and the gorilla. It is, in fact, almost certain that a union between these two apes would be fertile and result in a hybrid. The Old World monkeys are so fundamentally akin in structure that hybridization may take place between genera apparently very diverse in outward form. It is probably well known to my readers that several cases have occurred in the Zoological Gardens of Mandrill baboons breeding with Rhesus monkeys from India, and the hybrids thus obtained breeding again with *Cercocebus* monkeys. Chimpanzees and gorillas are said to attack women, but I think it is mainly with the idea of making them throw down their loads of food, which are then seized and carried off. Any woman dragged by a male ape to the forest would soon be killed by the feminine apes of the neighbourhood. Female baboons and chimpanzees are inordinately jealous of women. Apes are particularly spiteful and contemptuous towards children. Indeed it is not safe to trust a full-grown baboon or a half-grown ape near young children. They will tear off their clothes, scratch them, make hideous mouths at them, tweak their noses, and lug them about by the legs. Yet their demeanour towards persons of riper age will be affectionate and submissive. I remember travelling home from West Africa once with a celebrated chimpanzee of many accomplishments, which, until we reached Madeira, travelled as and was treated like a first-class passenger, behaving in his freedom with absolute decorum. When the vessel reached Madeira a number of passengers came on board, amongst others being a very young baby. This was sometimes placed by its mother in a cradle on the upper deck. One day while we were all at lunch the chimpanzee (who had become very jealous of the attention shown to this infant) disappeared. I followed it from the luncheon table to see what it was going to do, and arrived just in time to prevent it from throwing the baby overboard. It had pulled the poor little child from its cradle (fortunately without serious hurt), and would certainly have hurled it into the sea if my arrival had not caused the guilty ape to drop the child on the deck and shamble away. After this proceeding it spent the rest of its journey as a deck passenger in a cage.

From a Photograph.

SILVERY GIBBON.

The Gibbon walks erect with absolute ease. This cannot be said of the other living anthropoids.

[The next article in this series will deal with the large Cats.]

THE GAME FISH OF AUGUST.

By the Rt. Hon. Sir Herbert Maxwell, Bart., P.C., F.R.S.

THE salmon-fisher bans August as the worst angling month in the year. Fish there are in plenty, no doubt, both salmon and grilse, rolling about in the pools, making mock rises in the most fascinating manner and luring the angler with perpetual promise of a tight line, which is seldom fulfilled. For some obscure reason, August is never a good taking month, save, peradventure, in some West Highland torrent, flushed with the brief Lammas spates, when he who happens to be on the spot may find his reward. The cream of river and lake trout fishing, also, is past before August. None but fingerlings seem to be on the move. In southern streams the annual mayfly orgies mark the height of the season, and even where the mayfly does not come, as in the Itchen above Chilland, and in most northern waters, the great trout lose their activity and, instead of vigilantly scrutinising every semblance of life that appears on the surface, can only be tempted to make an occasional indolent rise or suspicious "boil."

But if salmon and yellow trout go into temporary retirement at this season, this is the month of all the year for sea-trout. Instead of sea-trout, I believe I ought to say salmon-trout, because, although on the West coast of Scotland we all recognise that estimable fish under the designation of sea-trout, the term bears a different significance in the Tweed district and the East coast generally. There it means what people in most other places call the bull-trout, a splendid fish in appearance, but a most disappointing one to the fly-fisher. More's the pity, for the bull-trout is a powerful creature and affords fine sport on those comparatively rare occasions when he does take the fly, and runs to a far greater average in weight than his more desirable cousin, the salmon-trout. I hooked one of these fish last April when fishing for spring salmon. He played deep and so resolutely that I am convinced that had I lost him he would have taken a place in local history as *the* great salmon of the season, aye, and of many seasons. Luckily for the veracity of history I landed the fish, which turned out to be a clean-run bull-trout weighing just 13½ lb.

Mr. Malloch, of Perth, lately sent me a photograph of a bull-trout weighing 40 lb., taken from the Tay in a net. In this country the salmon-trout seldom reaches the weight of 10 lb.; one of 6 lb. is an exceptional but not unusual prize for the fly-fisher, and even a fish of that size will try his tackle and skill to the utmost; for of

Photograph by Mr. P. D. Malloch, Perth.

SALMON-TROUT *(Salmo trutta).*

Weight 18lb., caught by the net in the Tay, April, 1902.

all the fish in British waters there is none that dies so hard as the salmon-trout. In most rivers they do not begin to appear till May or June, the larger fish leading the van in the annual migration. In June and July more salmon-trout will be taken weighing over 2 lb. than under that weight. With the advent of August, shoals of smaller fish make their appearance and crowd into the estuaries, waiting for water to carry them up to the lochs and spawning grounds. Those which weigh not more than 1 lb. have been classed by some naturalists (chiefly local ones) as a separate species; but there is not the slightest reason for doing so. These smaller fish, known as herlings in South-west Scotland, as finnocks in the Highlands, as whitling in the Tweed, may be regarded as salmon-trout in the "grilse" stage, that is, fish returning from the sea to spawn for the first time.

Angling for sea-trout in a breezy loch or swollen stream is not a very delicate art. The fish are not fastidious in the matter of flies; anything moving, be it not too big, will attract them; if with a bit of glitter in it, so much the surer. It is not hunger which makes them take the lure so much as curiosity or mischief; for they have just left the sea, and all their muscles are charged with nutriment derived from the provender enjoyed in that abundant store-house. I have never been able to detect the alleged superiority of

Photograph by Mr. P. D. Malloch, Perth.

BULL-TROUT *(Salmo Cambricus).*

Weight 40lb., caught in the Tay, June, 1900.

one colour over another in attracting them, and, although I certainly have seen small sea-trout feeding on the natural fly, I have also seen a large sea-trout drown, with a flap of his tail, a floating white butterfly without the slightest intention of devouring it.

It is a wonderful and beautiful sight that may be witnessed in times of drought at the mouth of a river frequented by salmon-trout. In hundreds, perhaps thousands, they crowd in with the tide, leaping perpetually, so that you may see three or four in the air at once. It is vain to angle for them at such times; at least, I have never scored a success. But let the fisherman have the patience to wait till it is quite dark, which, in August, may be about half-past nine or ten (in the North), and he may fill his creel many times over. The fish at that time work up over the shallows into the lower pools of the river; it is wonderful what thin water they manage to get through. Like the Mississippi steamers, they seem able to go wherever it is a little damp. You may hear them rattling over the gravel like so many rabbits.

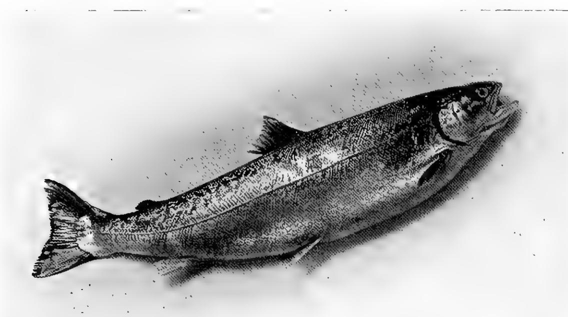
Salmon-trout show marked and apparently capricious preference for certain rivers and parts of rivers. They are, perhaps, more numerous on the west coasts of Scotland and Ireland than elsewhere in the United Kingdom, and swarm up certain streams when flooded, which, in the summer droughts, become the merest rivulets. In some other streams of far greater volume and, to all appearance, more desirable in every way, they

Photograph by Mr. P. D. Malloch, Perth.

FIVE SALMON-TROUT,

Weighing 23lb., caught in the Tay at Stanley, July, 1901.

seldom appear. Here is an example. Three rivers—the Cree, the Palnure, and the Bladenoch—fall into a common estuary at the head of Wigtown Bay, in the Solway. All three are frequented by salmon, but I have never seen a salmon-trout above the tidal water in the Bladenoch. The whole body of them passes into the other two rivers, whereof one, the Palnure, is not more than a fifth in volume of the Bladenoch—a mere mountain burn, in fact. The Cree, by far the largest of the three rivers, draws great numbers of salmon-trout; but before they have run far up they turn aside into a fourth stream, the Penkiln, of dimensions as insignificant as the Palnure. They thus desert the ample channel of the Cree, with thirty miles of spawning ground, for the narrow and inconvenient quarters of the Penkiln. In other salmon rivers of the district it is different; salmon-trout push right away up into the headwaters and spawn in company with the salmon.



Photograph by R. Thiele & Co., Chancery Lane

SALMON-TROUT (*Salmo trutta*).

Like all migratory salmonoid fish, the different species and varieties of sea-trout probably have descended from common and not very remote ancestors. Strong evidence of the close relationship, if not the common ancestry, of all British salmonoid fish, is furnished by their similarity in youth. The yearlings of all species, so far as has been ascertained—salmon, migratory trout, brook and lake trout, and grayling—are *barred*, as well as spotted. In colouration they are hardly to be distinguished from each other, though migratory trout usually show two more bars than brook-trout. When the young salmon-trout is about to start seawards, all the bars and most of the spots disappear under a beautiful silvery coat. Brook-trout, also, when allowed sufficient food and space to develop freely, lose their bars and often change their spots, becoming, under certain conditions, almost as silvery as sea-going fish. But when fare is scanty and quarters narrow, they retain their juvenile colouring and marking through life, thereby suggesting that these are the primitive livery of the family. Yet, supposing that European salmon and migratory trout have sprung from the same ancestry as our common river trout, it is perplexing to account for their specific differences. Inhabiting the same waters, alternately fresh and salt, migrating to and fro at the same seasons, it might have been expected that they would develop identical characteristics.

Fresh light may be thrown soon upon the problem by what is going on in the waters of New Zealand. Common English brook-trout, introduced there, have thriven wonderfully and attain a great size in a relatively short time. Attempts to acclimatise salmon and salmon-trout in the southern hemisphere have met with uniform failure; but it is most interesting to note that no sooner had the brook-trout made themselves perfectly at home there than they acquired the sea-going habit and have been taken in the salt water of great size and with coats as silvery as salmon or salmon-trout. Practically, they have become a fine race of salmon-trout. Here we seem to witness, re-enacted under our eyes, the process by which the different species of migratory trout were originally established.

Herbert Maxwell

THE MARSH WARBLER: WHEN AND WHERE TO LOOK FOR IT.

All about a little known British bird.

By W. Warde Fowler, M.A., Author of "A Year with the Birds."

THIS delightful little bird, which was first discovered in England in 1861, is now known to breed regularly in several of our western counties, and has also been found in the fen country. Whether it is in reality still more widely distributed is a question which we cannot at present answer; but it is quite possible that it escapes the vigilance even of good field ornithologists, owing to the lateness of its arrival in this country and the rather secluded nature of its haunts. On the other hand, my own experience rather leads me to believe that it is still very sparsely distributed and not increasing in numbers in any appreciable degree. I myself, and friends who know the bird well, have searched diligently and failed to find it in many places where we might well hope to do so, and in my own neighbourhood I have never yet discovered it except in the one spot where for ten consecutive years it has allowed me to study its habits. It may be of use to those who are in search of it if I summarise my own experience of its ways in this country, more particularly as regards the time and place of its nesting.

In the first place, it is little or no good to look for this bird in its breeding haunts before the end of May—a time when we have ceased to listen for the voices of new arrivals. The marsh warbler is quite the latest of our summer migrants: in ten years I have only once been able to detect it before June 1st—once on May 30th and this year on May 31st. On each of these occasions I feel sure that it had only just arrived; for, like the nightingale, it does not break at once into full song, but will make its presence known only by an occasional note, which might easily be mistaken by the inexperienced for that of the linnet or whitethroat. It is restless for a day or two, and seems to be roving about in the process of identifying old haunts, too busy to sing vigorously until those haunts have again become familiar. Or it may be that some unwelcome change has been wrought there during the winter—willows cut down, meadow-sweet and willow-herb not yet grown up as the bird remembers them; and to these changes it has to accustom itself, or to decide whether it may not be better to look for other quarters. However this may be, it is certain that the plants in which this bird delights to hang its nest are rarely ready for such use until June is well advanced, and it is useless to expect it much before that time. My records show that I have never found the nest begun before June 14th, and that I have never known an egg laid until June 18th; the hen is sitting on her full number of eggs as

a rule in the last days of June, and I have known young only just hatched as late as July 10th. In Switzerland, where it is common on the marshy margins of lakes, it is almost as late in its breeding as in England; the plants in which the nest is placed are not sufficiently grown before June has begun, and eggs may be found up to the end of the month.

Next, if I am asked where this bird should be looked for, I should answer without hesitation, in an osier-bed. In the fenny country or in the marshes of the Parret it may no doubt be found, as I have found it abroad, in more open places; but in the highly cultivated parts of central and southern England, I doubt if it is worth while to search for it except among osiers. Some forty or fifty years ago, when landlords and farmers were doing well, it was found that osiers were a paying crop and numbers of beds were planted, not only by the sides of rivers, but in suitable spots in odd corners of arable and pasture fields; and I may parenthetically remark, as a point worth consideration, that the date of the discovery of the marsh warbler as a British bird exactly coincides with this activity in the osier trade. The two osier-beds in which I myself have found the bird were planted, one about thirty and the other about forty years ago. Then there came a time when competition, chiefly I believe from Egypt, brought down the price of English osiers and many of these beds ceased to be properly attended to, failing to repay their owners for the considerable sums expended on them every year. They became deserted and overgrown in many instances, and all kinds of marsh plants flourished, and still flourish, in their recesses. These deserted beds are what the marsh warbler really loves, if at least they are not too dense and tangled and overgrown with nettles and other rank vegetation; they then become close and unwholesome, and fail to provide the marsh warbler with the air and freedom that he loves. Supposing you are the possessor of an osier-bed which you wish so to treat as to tempt a marsh warbler to settle in it, do not let it overgrow itself and get rank, but at the same time do not cut it all down and clean out every corner of it in the winter. By all means cut down the taller willows, but leave the younger ones standing here and there in patches, so as to give the birds sufficient cover and, at the same time, sufficient freedom and fresh air. During the best season I ever had for studying these birds, when I had four nests under observation in a space of about half an acre, the osiers were in a state of neglect, but had not been so for too long, and there were open spaces

From a Photograph supplied by the Author.

NEST OF THE MARSH WARBLER.

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THE MARSH WARBLER (*Acrocephalus palustris*).

Photo. by the Scholastic Photographic Co., Wandsworth.
THE REED WARBLER *(Acrocephalus streperus).*

in the middle of the bed of which the bird seemed to be particularly fond, while they avoided, as far as I could see, the dampest and densest parts of the cover. A year or two later the condition of the bed became very bad; the nettles made all the undergrowth rank and unpleasant, and one pair of birds was driven to make use of at least one nettle-stalk to support their nest. The land was sold, and the present owner, to whom I frankly explained the whole ornithological situation, now most kindly and considerately adapts the bed each spring to the propensities of the birds, leaving a clump or two of willows standing at one end, while he cuts down the rest. So far, this has answered very well, though we have never had so many pairs of birds as in the year I alluded to above. Another osier-bed, half a mile away, has been visited by the birds only twice in ten years, and each summer it was exactly in the condition which I have described as being most agreeable to them.

I may add that this bird will far more easily be detected by the ear than by the eye. It is often difficult to get a good look at it, and when seen it is extremely hard to identify, unless singing. When you are quite familiar with it, the points of difference between it and the reed warbler become more obvious; but they are chiefly differences of figure and attitude which cannot be represented in a plate nor studied in a skin, and it is only when you have had the bird within a few feet of you or have seen it on the nest that you become aware of a difference in the general colour of the plumage, which is of a lighter and less rufous brown—light earth brown, I should call it, not olive brown, as it is usually described in books. But the best way to identify the bird is to listen for a clear, silvery voice—the piccolo in the orchestra of bird music—which indulges itself in all manner of amusing freaks and imitations of other birds—a voice which is often silent for an hour together, and then suddenly breaks out in a succession of delightful phrases with hardly any harsh notes and many sweet and liquid ones. In the first days of June this song is perhaps at its best and in the earlier hours of the morning. When the cock bird has attracted a mate and the nest is begun the song slackens for a few days, as is the case with most of our summer migrants; but as soon as the first egg is laid the male begins to sing again *con brio*, and now usually near the nest, instead of changing his position frequently.

It is not my present object to describe either nest or eggs; that has often been done before, and the pleasure of identification may well be left to the careful searcher. I would only ask him, if he should be lucky enough to find the nest, either to leave it untouched or at least to refrain from taking the whole clutch of eggs. The bird should have every possible encouragement to return next year to the same breeding-place, and it will very readily do so if unmolested.

W. Warde Fowler

THE LIFE OF PLANTS.

By the Right Hon. the Lord Avebury, P.C., F.R.S. (Sir John Lubbock).

Showing why flowers are of different colours; why they go to sleep; why some keep different hours from others; and the devices they use for procuring their food.

PART II.

FRUIT and seeds are scarcely less interesting, and often hardly less beautiful than flowers. They present many most interesting contrivances and adaptations. I will only deal with the means by which they are dispersed. Some, like the dandelion, willow herb, cotton, cotton grass, &c., are provided with hairs—often feathered—by which the wind wafts them away. Others are provided with wings for the same purpose. Some, like the cleavers, docks, agrimony, burrs (Fig. 1) are covered with hooks which catch in the fur of any passing quadruped. Some are good to eat. Many of them sacrifice themselves for the good of the rest. Take the hazel nuts, for instance. Thousands of them are eaten by squirrels, but many are dropped, or lost, and thus carried to a distance. In many cases, as in apples, cherries, peaches, grapes, currants, &c., there is a sweet and juicy flesh which is carried about and eaten, while the actual seeds are protected by a more or less thick crust and are thrown away. In these cases it is interesting that very often the unripe fruits are green and unattractive, while, when mature, they assume brilliant colours, which seem an invitation to the feast!

In some instances plants actually throw their seeds; this is the case with some violets, peas, geraniums and many others. The distance to which they can be thrown is often very remarkable. I tried to ascertain this in the case of our common herb, Robert (Fig. 2). In the open air this cannot be done, for it is impossible to find the seed when once thrown. I therefore brought some into the house and put them in a glass on a table. Still I could not find them. At last, by spreading out a large sheet, I was able to do so, and found they were thrown more than 20 feet.*

Other plants sow their own seeds, for which most ingenious contrivances are provided. Some of our violets do so. I have already mentioned the dog violet (Fig. 3) as one of the plants which throws its seeds. Other violets bury them (Fig. 4). What is the reason for this difference of habit? I have elsewhere suggested that it depends on the mode of growth. The dog violet has a stalk, and the flowers are thus more or less raised above the ground. In the species which bury their seeds there is practically no stem, the flower rises directly from the ground. Under these circumstances if the plant attempted to shoot its seeds, they would merely strike against some neighbouring leaf and immediately fall to the ground.

Fig. 1.

* See my "Flowers, Fruits, and Leaves," p. 58 (Macmillan).

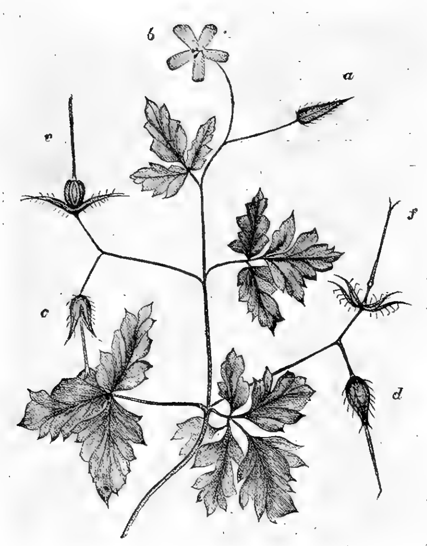


Fig. 2.

Hence, I think, we see that the arrangement of the capsule in each species is that most suitable to the general habit of the plant.

In many plants with seed capsules—such as poppies (Fig. 5) and campanulas (bell flowers)—the capsules when ripe open at the top. The first high wind swings the cup from side to side and thus scatters the seeds.

There are a great many campanulas, and there is a curious difference in the capsules; some open at the free end, some at the base. Why is this? I have suggested that it depends on the position assumed by the capsules. In some species they stand upright and in these they open at the summit: in others the capsules hang down and these open at the base. Thus in both cases they open at the higher end: if they opened below, the seeds would simply drop to the ground, but as it is they lie in the cup till some high wind gives it a good shake and throws them to a distance.

Perhaps you will say that these are mere fancies—purely accidental coincidences. Let us then look at our trees and shrubs as a group.

Fig. 3 (*Viola canina*).

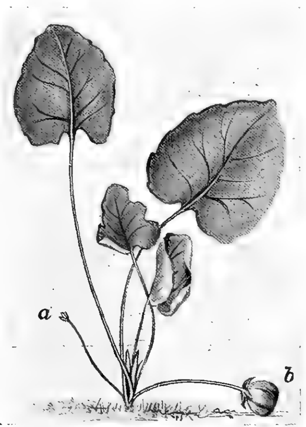


Fig. 4 (*Viola hirta*).

Winged seeds are only useful when they start from a certain height. They occur in many trees—ash, lime, maple, sycamore (Fig. 6), pine, fir, beech, and hornbeam—but not on low plants. Hooked seeds, on the contrary, would be useless on high trees or even on shrubs above the height of a horse or cow. They occur on docks, burrs, and many other herbs, but are not found on a single tree or even on any shrub. Edible seeds especially characterise low trees and shrubs loved by birds—such as the cherry, holly, ivy, yew, nut, &c. These, probably every one will agree, cannot be mere coincidences.

One of the most remarkable seeds is that of a rare English grass, the *Stipa pennata* (Fig. 7). The actual

seed is small, with a sharp point, and stiff, short hairs pointing backwards. The upper end of the seed is produced into a fine twisted corkscrew-like rod, which is followed by a plain cylindrical portion, attached at an angle to the corkscrew, and ending in a long and beautiful feather, the whole being more than a foot in length. The long feather, no doubt, facilitates the dispersion of the seeds by wind; eventually, however, they sink to the ground, which they tend to reach, the seed being the heaviest portion, point downwards. So the seed remains as long as the weather is dry, but if a shower comes on, or when the dew falls, the spiral unwinds, and if, as is most probable, the surrounding herbage or any other obstacle prevents the feathers from rising, the seed itself is forced down and so driven by degrees into the ground, or if the wind rises it catches the feather and twists the seed into the ground like a corkscrew.

Fig. 5.

I have not space to discuss the roots or stem, but should like to say a few words about leaves. We all know the endless variety they present, and we may be sure that there is some cause and explanation for every one of these differences. There are many interesting problems in this field. Let me just give you one or two illustrations.

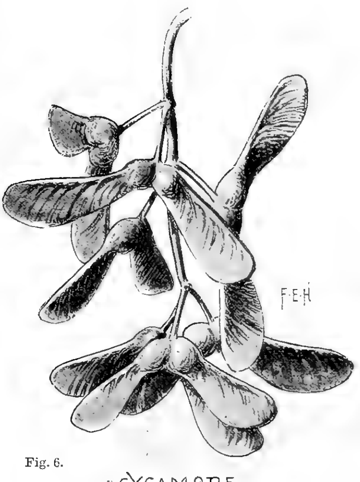


Fig. 6.

Take for instance the beech (Fig. 8). The sails of a ship must be proportionate to the strength of the masts that carry them. So also the strength of the branches determines the leaf area. In our trees the leaves are arranged so as to get as much light and heat as possible. In hot dry countries they are often arranged so as to cover and protect one another, in some of the New Zealand veronicas for instance. With us it is the reverse. Hence the width of the beech leaf is determined by the distance between the buds—if they were narrower space would be wasted; if they were wider they would overlap. The size and width being thus arrived at the length is also determined—if they were shorter they would be too small, if they were longer they would overweight the branches.

Fig. 7.

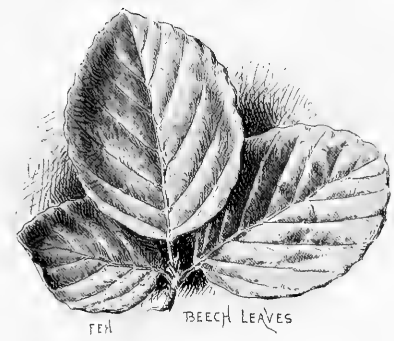


Fig. 8.

Now let us take a tree with very different leaves—the Spanish chestnut (Fig. 9). They are long, narrow, and sword-shaped. Why is this? The terminal branches of the Spanish chestnut are much thicker and stronger than those of the beech. Consequently they can carry more sail. But the distance between the buds is but little greater, consequently the leaves cannot with advantage be much wider; but as they must be larger they must be long and narrow. Take again the firs and pines. Some have long leaves, in others the leaves are short. Why is this? They are, as everyone knows, evergreen, but the length of life of the leaves differs greatly. Some keep them on for little more than a year, others two or three years, others eight or ten, the pinsapo nearly twenty. And you will find that other things being the same, the longer the life, the shorter the leaf—thus securing about the same leaf surface. To look at plants from this point of view makes country life, it seems to me, far more interesting.

Another point in which our conception of plant life has undergone considerable modification of late years is as to their power of movement. Those who had not studied the question used to consider that animals moved but plants were stationary. We now know that many of the lower plants, especially in young stages, swim about by means of fine hairs known as cilia. In fact, plants move much more than is supposed. I have given instances in which they actually throw their seeds to considerable distances. Indeed, so far from being motionless, it would be more correct to say that they are in almost perpetual motion, though the changes of position are so slow that they do not attract attention.

Fig. 9.

I have mentioned a few cases in which the reasons for the forms and shapes and colours and habits may be explained with more or less probability, but the unsolved problems of plant life are almost infinite. To make a collection is no doubt interesting, but it is like making a library. What is the use of the books if you do not read them? What is the value of a collection if you do not use it? The problems of plant life are all but infinite. Great indeed as is the pleasure which flowers give to the eye, it is less than the delight which they afford the mind. They offer an endless series of most interesting mechanical, optical, chemical, and other problems.

It is not going too far to say that there is not a single plant—not even the commonest—of which the whole life history, properties and structures are fully known to us—not one which would not well repay, I do not say the attention of an hour, but even the devotion of a lifetime.

Avebury

The Naturalist at the Sea-Side

Written and Illustrated with Photographs by EDWARD STEP, F.L.S.

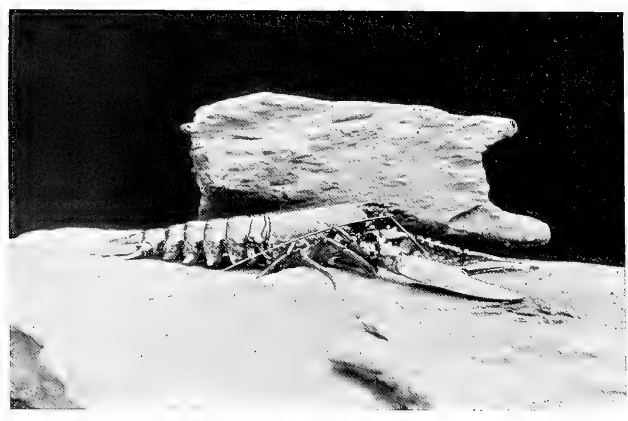
Telling tourists to the seaside how and where to look for Natural History objects by the shore.

AMONG the thousands who at this period "go down to the sea" from the inland towns, there are many who remember something they have read of the wonders of the shore, and they think they will turn their holiday to profit by finding out what they can of these wonders. Very often they are greatly disappointed, and decide that what they have read was the work of an imaginative writer, for their rambles along the sands yield them little more than broken shells, a few dead and damaged crabs, a collapsed jelly-fish, and masses of mutilated seaweeds whose glory has been dimmed by constant rolling in the surf.

THE SQUAT LOBSTER.

This is really a crab; it is little known, but can be found on our shores by those who know where to look for it.

What they really need is a little practical advice where to look and what to look for. Much, of course, depends on the locality chosen. The ideal bathing-place, where the sands are so flat and firm that you can walk out in the water for a quarter of a mile without wetting your chin, will yield comparatively nothing to the naturalist, except by dredging from a boat far out. If you were asking for the best advice I could give you, I should say, take a ticket for Truro or Falmouth, on the Great Western Railway, and make your way to one of the fishing villages which abound along the south coast, often hidden away in some rocky cove. Here you will find moderate expanses of sand alternating with low reefs, the feet of the slaty rocks being fissured and fretted, and hollowed into caves and basins which are teeming with life; but so well do most



THE COMMON LOBSTER.

things harmonise with their immediate environment that the superficial observer sees the weed-covered rocks with their pools of clear water and little else. But it is among this material that anyone with a seeing eye will find more marvels than he can exhaust the interest of in the regulation fortnight's visit. And now, how to go about it? First, ascertain from any of those—fishermen, boatmen or coastguard—whose living is intimately associated with the sea, at what hour to-day low-water will be. Then start out an hour or two beforehand, and selecting some gully or the shoreward edge of a reef, go right down to the water. The wracks that hang over the rocks are dripping wet, for the sea has but just receded from them. Turn them back, and you will see the anemones not yet closed or flaccid. The soft yellow, white, red or green encrustations on the vertical face of the rock are sponges, the crumb-of-bread sponge probably predominating. A few square inches carefully prised off with your knife and put into a glass jar of water will reveal to you the volcano-like action of the currents which are being drawn in by the minute pores and expelled by the little conical peaks. Feeding upon the sponge and looking so like it that you may not at first see any difference, is the great slug called the sea lemon. There are purples and dog-winkles and top-shells close at hand. The ticking sound that comes from a crevice should lead you to investigate closely, for there is certainly a crab of some kind hiding there. Every stone at the base of the rock should be turned, and almost every one will be found to hide some creature or other—a worm-like pipe-fish, a rockling or a crab. In these situations, too, will be found a little-known crab that greatly resembles a lobster in form, though more depressed, and consequently named the Squat Lobster. Although little more than a couple of inches long, he has considerable muscular power in his flat and spiky nippers, and a surprising sense of locality shown by darting backwards into a narrow hole, by vigorous flappings of his broad tail. Small specimens of the

HEART URCHINS.
Called by the Cornish fishermen, "Pussy."

common Jack crab of the fishmonger's shop will be found under the stones partially embedded in the sandy mud, and there will certainly be that most brilliant of our native crabs, the Velvet Fiddler, clad in rusty velvet picked out with bright crimson and blue, and with gleaming white beads on his nippers. Pugnacious he is, too, beyond all his fellows.

About the so-called "roots" of the olive wracks many small fry of various classes of life will be found—especially the marine worms, many-jointed creatures of great length and beautiful colouring. Many of the smaller species of these worms, too, may be brought to light by prising off flakes of the slaty rocks where they appear soft. Every crack and crevice, every overhanging ledge, should be regarded as a possible and probable lurking place for some form of life which seems specially fitted to occupy that nook. To return to the weeds, many things that prowl about their jungles when the sea covers them remain quietly there when the tide ebbs

THE VELVET FIDDLER CRAB.
The most brilliantly coloured of our native crabs.

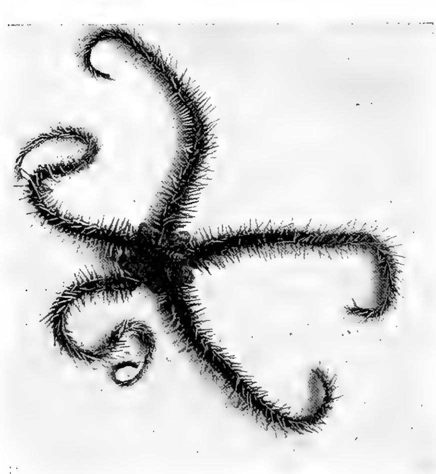
out and leaves them stranded: even some fishes, such as the blennies and the father-lasher; also the starfishes, not only the common orange-coloured five-fingers, but a larger and handsomer one, the glaucous starfish, of greyish blue tint, studded with round cushions with central spines.

Then there are the rock-pools. I have heard it said that one rock-pool is very like another; but that is a mistake. Nearly every rock-pool has distinct individuality, if one may so speak of an inanimate matter. They have all been formed by similar agencies, but they are all different in shape, size and depth, all important points influencing the particular sea plants that will grow in them and, as a consequence, the animals that will choose them as suitable homes or hunting grounds. A superficial examination of these pools is not sufficient. Many of the creatures harmonise so well with the coralline-covered walls, the sandy bottom or the green weeds, that a pair of remarkably acute eyes is needed to discern them at once.

Many a time have I shown to a friend what is to all appearance an untenanted pool, and yet one after the other I have made him see forms that at first were merely parts of the general scheme of decoration, but ultimately attain some solidity and stand out distinct when the eye has learned what to look for. In such a pool there may be a score of small shannies with their bright mobile eyes turned up at you and curiously watching every movement, but quite invisible to the watcher who is not looking for anything in particular. But when I have put my finger-tips in the water and wriggled it gently, all the shannies converge towards it, clinging to the walls as long as possible for the colour protection they afford, and at last making a jump for the finger-tips. Small prawns, erstwhile invisible, also come to the same bait.

SMOOTH VENUS SHELL.
These are washed up by gales from deep water.

You have got to adapt your eyes to see through the clear water to the bottom, and the glare of sunshine on the surface often makes this very difficult, but the shadow of your hat will be found helpful. Daisy anemones and the gem pimplet anemone at the bottom are species that only come into view after you have been gazing at them for some time. Then you will see brittle-stars and sand-stars wriggling about as though their five arms were miniature snakes. Small sea-urchins are there, and young hermit crabs scrambling unsteadily beneath their winkle-shell houses. The weeds that drape the walls harbour many small crustaceans, including the remarkable skeleton shrimp that successfully imitates the jointed lime-coated corallines.



BRITTLE-STAR.

Where the sands are of fine grain they may be explored with spade or trowel. In suitable localities the digger may be rewarded by specimens of the masked crab, the round crab, or the singular heart-urchin, which Cornish fishermen call "Pussy," its stone-box being covered with a thick close coat of depressed silky bristles in lieu of the stiff upright spines of the other species. All this digging work must be carried out in the sands as near low-water mark as possible. There will be found the razor-shell and many other bivalves, including the handsome spiny cockles, and on the surface washed up by gales from deeper water the fine Smooth Venus.

Above the tide-marks on the sandy shore there are interesting land snails, especially under the leaves of such plants as sea holly and burdock. While for the botanist, of course, both cliff and sand-

dune above high-water will be found productive. In such situations beetles are also plentiful, and numerous birds select these resorts for nesting, though spring-time must be the season for our visit if our special interest is in the birds. But we have probably said enough to indicate that every part of the shore, if not covered by crowds of idle loungers, is worth close examination, and is sure to reward the careful observer with "specimens" innumerable, whose number and variety will be in exact proportion to the

POOLS AMONG THE ROCKS.

A good hunting ground for the seaside naturalist.

seclusion of the ground worked. Therefore, turn your back upon the favourite resorts of the crowd of trippers, and seek some part of the coast they have not yet discovered.

N.B.—Don't neglect to cast your eye over the bottom-boards of the crabbers' boats when they come in and are beached after the morning visits to the crab-pots.

Edward Step

[An interesting article by Mr. Step on the Masked Crab, mentioned above, will be given in an early number of ANIMAL LIFE.]

From a Photograph.

DEATH'S-HEAD MOTH—FEMALE. (Natural Size.)

THE DEATH'S-HEAD HAWK-MOTH.

BY PROFESSOR F. E. HULME, F.L.S., F.S.A. (Photographs by J. J. Ward.)

THE beautiful insect depicted on the coloured plate, and shown in photographic reproductions on these pages, is the largest of our British moths, and, alike from its noble size, from the beauty of its form and the brilliancy of its colouring, compels our attention, while the curious skull-like mark on the body gives it just that little touch of the weird which seems to have for many people an irresistible attraction, and has always rendered the insect an object of terror to the ignorant and superstitious.

While our coloured illustration represents three stages of the life-history of the creature, we need scarcely point out that these can never be found thus together in nature, though one might get two of them as contemporaries, some of the caterpillars being possibly still to the fore while others had exchanged this prior state of voracious activity for the quiescent pupa condition; and at a later period, in the next stage of their eventful career, some might have burst the bonds of pupa-hood, while others yet remained bound therein.

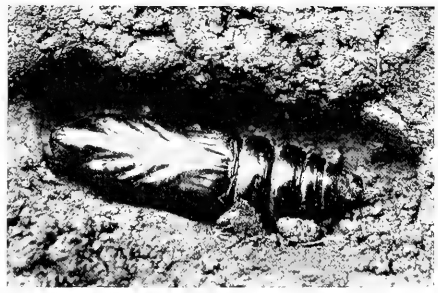
From a Photograph.

CHRYSALIS OF DEATH'S-HEAD MOTH. (Natural Size.)
Beneath the soil.

The caterpillars, or larvæ, should be sought for in August, or possibly the beginning of September, in the neighbourhood of dwale, woody nightshade, jasmine, tea-tree or potato, the latter plant being the favourite. They vary somewhat in colour from almost pure yellow to a clear green or sometimes even a strong brown. When the larvæ are fully developed they bury themselves in the earth and there pass into the pupa or chrysalis stage, and after many months of

this subterranean torpor, emerge at last the perfect winged insects.

The creature, in all its stages of existence, has the curious power of emitting sounds. The larva on being interfered with draws back its head angrily and makes a sharp snapping noise; the chrysalis when about to pass to the moth stage squeaks very audibly, while the moth itself gives a sharp mouse-like cry when handled; uncanny peculiarities that render it yet more an object of terror to the superstitious. Another curious habit the creature has in its final stage, is that it is so particularly fond of honey that it creeps into the beehives in search of it, abstracting by means of its short proboscis the honey from its rightful owners, who are quite unable to eject the marauder.



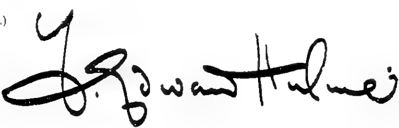
From a Photograph.

CHRYSALIS OF DEATH'S-HEAD MOTH. (Natural Size.)
Showing under side.

The scientific appellation of the Death's-Head is *Acherontia Atropos*, names recalling, in classic mythology, the gloomy river bordering the shades of death, and the relentless Fate who severed at her will the thread of human life. It is curious that while we have in Britain no other insect at all like it, it is not by any means a unique design in nature, the *A. Medusa* and the *A. morta*, for instance, of Japan, Java and the far East generally, being almost identical in size, colour and markings with the *A. Atropos* of Europe, the subject of our illustration, and bearing, as their names clearly suggest, the same strange, skull-like form on the thorax.

From Photographs

DEATH'S-HEAD MOTH—MALE. (Natural Size.)
Upper and under sides.



[In next month's ANIMAL LIFE will be published an article by Mr. Fred Enock, F.L.S., on the life history of the Dragon Fly, illustrated with another series of this author's remarkable photographs from life.]

ANIMAL ANECDOTES.

An Intelligent Monkey.

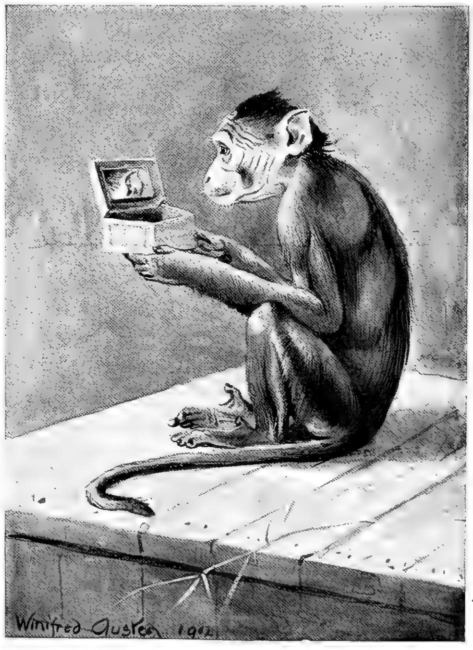
M. Hachet-Souplet, who has lately founded an institute for the study and development of animal psychology, has been making some remarkable experiments with various animals, and tells an interesting story about a monkey which came under his personal observation. "Recently," he says, "I compelled a monkey to go for sweets to a box, the cover of which was ornamented inside with a mirror; not only did the animal discover that the glass reflected his own image, but after a few days he used the mirror as a dandy would. One day a bit of liquid plaster fell on his face and immediately hardened. The monkey ran to the box, opened it, and used the mirror to scratch away the plaster. Likewise he would often go to the glass, and, pulling his cheek with his finger, see exactly what quantity of hazelnuts he had stored in the pockets of his chops."

A Lion Story.

The same authority tells another story of an experiment with a lion in the Jardin des Plantes. In the centre of this animal's cage was placed a closed box with a heavy lid on hinges; inside was a large piece of meat. The lion was then let in. At first he displayed signs of uneasiness on seeing this unusual-looking object, then he smelt the meat and searched for it by sniffing vigorously, but all the while remaining seated in the cage, merely moving his head to get the scent. It did not take him long to discover that the meat was inside the box, but still he was a little nervous, and to guard against any other possible surprises that might be hidden in the unwonted square object in the centre of his cage he approached very cautiously, and then took a turn round, eyeing it closely. At last he gave the chest a quick scratch to see whether it would strike back, and sprang away at once, much as a kitten does when playing with a ball of wool. Convinced that the strange object was not dangerous, the lion now tried to overturn it to see if the meat were not underneath, but as the box had been screwed to the ground, it was impossible to move it. Without using any brute force, he continued to examine it patiently and finally, struck by an idea, he took the edge of the lid delicately between his teeth and raised it without violence, until it fell back on the other side and remained open, thus giving him free access to the meat. As soon as he had finished eating this, his keeper happened to scold a panther two or three cages away. At the sound of his voice it must have flashed through the animal's brain that he had eaten meat in all probability not intended for him, so in fear of punishment he shot the cover back with a quick movement of his nose and crouched in a corner as if nothing had happened.

The Adventures of two Sparrows.

Mr. Ernest Seton-Thompson, whose animal studies with brush and pen are so well known, has been telling the story of a sparrow whose adventures he has been following from his study



The monkey used the mirror to scratch away the plaster.

Biddy was caught suspended in the air.

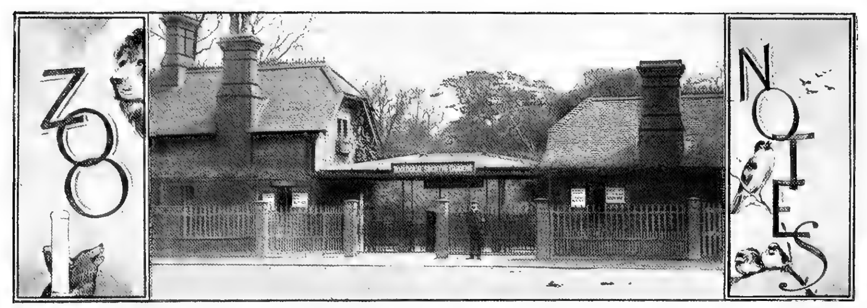
window. It appears that the sparrow in question had been hatched in a barber's shop by a canary, who taught him to sing in a most unsparrowlike way. An accident, however, to the cage in which he was kept was the cause of his escape from captivity, and from this date his adventures may be said to have begun.

First of all he made a nest of twigs, the nearest approach he could find to the wicker-basket nest of his foster parents; then he made love to a biddy sparrow and conducted her in triumph to the nest he had built. But, alas! she would have none of it; after a hasty look round, she took hold of a twig and threw it overboard, to show her disapproval, then flew away and remained absolutely deaf to all his entreaties to return. Nothing daunted, the cock set to work to demolish the nest he had so carefully made—the work of a week—and before long nothing remained of it save a pile of sticks heaped up on the ground below. Next day he returned once more with Biddy, who, finding the nest demolished, expressed her satisfaction and at once began to help him make another—this time of hay.

The days went on and egg after egg was added to the new nest, till at last there were five. Then it occurred to Mr. Thompson to try a little experiment. Watching his chance, late one evening he dropped a marble into the nest. "What happened at once," he says, "I do not know," but early the next morning he saw these two sparrows locked in fierce combat, hammering and pecking at one another in deadly earnest. That afternoon he found below the nest not only the intrusive marble, but also the remains of the five eggs. There was evidently neither luck nor peace in the old nest, and the two (having decided to forget the past) agreed to abandon it and hit upon the somewhat original idea of building a nest on the top of an electric light. This, however, was also doomed to failure, though not until a week's labour had been expended on it. The third site chosen was the high fork of an elm tree. This time Biddy decided to use horsehair wherewith to line her nest; but, alas! the nest was all but finished when she put her head through one of those dangerous hair nooses she had so skilfully made and was caught suspended in the air. The more she struggled the tighter became the noose. Her mate did all he could to release her, but only made matters worse, till at last Biddy hung stiff and silent, and the cock sparrow knew that all was over.

He had never been very alert; he was always venturesome and heedless, and now he became more so. One day he was run over by a bicycle and his wing got injured; he managed to hop away, but was eventually captured by a little girl, and now he is restored to his original owner and will probably end his days where he began them—in a canary cage.

[N.B.—The above story is given in greater detail in Mr. Seton-Thompson's charming book, "Lives of the Hunted," the English edition of which is published by Mr. David Nutt, who also publishes the same author's "Wild Animals I have known." Both books contain such charming stories of animal life that it is impossible to praise them too highly. No lover of animals can fail to enjoy reading these fascinating volumes of true stories.]



Described and Illustrated with Photographs by W. P. Dando, F.Z.S.

3,000,000lbs. of food consumed annually.

Few visitors conceive the enormous amount of food required to feed the animals at the Zoo in one year and the number of varieties necessary. A *chef* at a first-class restaurant has not so many different tastes to cater for, and it will astonish most people when I state that over 1,338 tons, equalling about 3,000,000lbs. of food, is the yearly consumption of the animals. The Report of the Council for last year shows that 2,691,012lbs. was provided by the Society, made up of 59 varieties, with "Liebig," 9,530 fowls' heads, and 33,300 eggs just thrown in as a luxury. The provender alone weighed 1,168,400lbs.; fish, 35,000lbs.; and the fresh meat, killed at the Society's *abattoir*, 916,400lbs. Under the *légumes*, carrots alone work out at 173,550lbs. All this is without reckoning rabbits, fowls, pigeons, rats, mice, live fish, and many millions of mealworms, etc., for feeding those animals who will only eat the food they kill themselves. For some reason the Report does not include these items, although we all know that snakes, etc., in the Reptile House, are fed on live animals: the big python kills and swallows whole several good-sized goats in a year.

Nor do the figures include the enormous amount of food given to the animals by the visitors, which amounts to many tons during the year. I learn from Mr. Humberset, the courteous manager of Spiers & Pond, who cater for the Zoo, that the average sale of "bags of food" sold weekly is about 500 during half of the year, without reckoning buns, cakes, etc., sold in the ordinary manner, which on a very busy day has amounted to 12,000 buns, 3,000 cakes, and thousands of rolls, a large portion of which finds its way inside the animals, and this again is without reckoning all the food brought into the Gardens by the visitors, so that my calculation is rather under than over.

In conversation with Mr. Clarence Bartlett,

THE OLDEST INHABITANT.

THE NEXT OLDEST.
The Syrian Pelican.

the Superintendent of the Zoo, he told me that numbers of animals die annually through overfeeding by the public with unsuitable food.

"Jim," the Oldest Animal at the Zoo.

THE fine Indian rhinoceros in the Elephant House is the oldest inhabitant at the Zoo, having been presented to the Society in 1864, and, considering that it weighs several tons, is remarkably straight on its feet. Contrary to popular belief, the skin of these animals is not bullet proof, in fact, it can be easily pared with a knife. There are five species of rhinoceroses—three Oriental and two African. The Rhinoceros Unicornis, though known to the Ancients, was seen for the first time by Europeans in 1513, when one was sent from India to the King of Portugal. In their wild state they display considerable ferocity when provoked, and, although apparently clumsy, can, when necessary, run with great swiftness.

"Jim," who is in perfect health, gives every indication of living another thirty-eight years at the Zoo.

BATELEUR EAGLE.
The new arrival.

BATELEUR EAGLE.
The old bird that died.

White Pelican, Syria.

FOR over thirty-four years this beautiful bird has been a captive at the Zoo, yet up to the present not any of the officials at the Gardens have determined its sex. Be that as it may, it is certainly one of the best specimens of its kind, and does great credit to its keeper.

Pelicans are the largest of the swimming birds, and in India they are found in enormous flocks, and authorities say they have seen *miles* of them. The careful manner with which they preen their breast feathers has given rise to an erroneous idea that these birds feed their young with the blood from their own breasts, and the fact that the tip of the pelican's bill is orange red in colour strengthened the belief. It is very amusing to watch these birds when the keeper enters the enclosure. They know perfectly well if he is accompanied by anyone that there is "something on"; and when he opens the gate which shuts them off from the pond, they file in and wait patiently until he has thrown some fish into

THE SECRETARY VULTURE.
(Serpentarius Secretrius.)

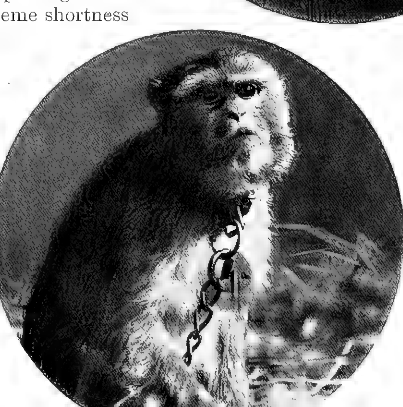
GARDEN'S NIGHT HERON.
Also called Dark Night Herons.

the pond. The gate is then opened, and in a "Chinese goose race" they make a dash for the water, and in a few seconds have swallowed everything and are out again and as busy as ever at their toilet. The pouch of these birds will hold quite two gallons of water, and you can calculate the quantity of fish it would contain. With the exception of "Jim," the rhinoceros, the Syrian pelican is the oldest animal in the Gardens.

Bateleur Eagle.

A death and an addition within a few days is curious, but this happened with the Bateleur, which is no doubt a most beautiful bird. The profile position is the photograph of the bird just dead, the other is the new arrival, which being young does not yet show the beauties of the plumage. In the old bird the extreme shortness of the tail is well shown, and this is a point which distinguishes the Bateleur from all other members of the family. They are inhabitants of the whole of Africa, and they prey on young antelopes, lambs, and sick sheep, although their chief food is snakes and lizards.

SILVERY GIBBON.



BENGAL MONKEY.

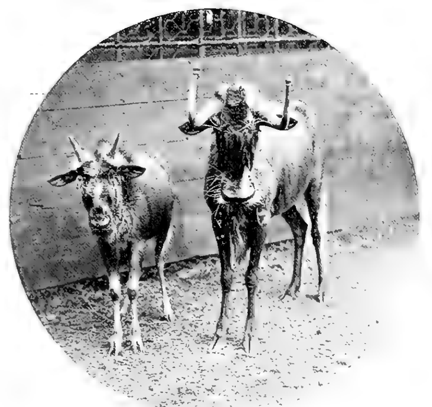
The Secretary Vulture.

Every keeper at the Zoo has his favourite, and that of Mr. Church, the veteran keeper of the Eastern and Great Aviary, is the Secretary Vulture. Mr. Church has been at the Gardens over forty years—longer than any other keeper. The other morning I met him carrying a small box, and in answer to my enquiry as to what was inside he said: "Oh, sir, it's only a snake for Billy." I followed him into the aviary, as I knew "Billy" to be the Secretary Vulture, and, although I had seen him kill rats, I had not seen him tackle a snake. The snake, which was about fifteen inches long, was thrown on the ground, and immediately the bird saw it he went for it in an instant, and quickly killed it with a series of kicks given with the rapidity of a postman's double knock, and with a force so great that death was instantaneous; then after looking at his victim, first with one eye and then the other, he got the head well in his beak and gobbled down the fifteen inches in a very few seconds. The Secretary Bird was so named by the Dutch in Africa on account of the similarity of the feathers behind the head to quills put behind the ears by clerks when interrupted in writing. These birds are held in high favour by the Boers on account of the service they render in destroying reptiles. In form it resembles both the crane and the eagle, having a body somewhat like the former and the head shaped like the latter; and as the following account by Levaillant, in his "Oiseaux d'Afrique," must be credited, I think the bird has the eating capacity of both. He says, in describing a fierce combat between a large-sized snake and the "serpent eater," as the Hottentots of the

Cape call the Secretary Bird:—"After an obstinate battle the serpent, realising the inferiority of its powers, stealthily tried to regain its hole; the bird, however, quick as thought, with one bound faced the reptile and cut off the retreat. This was several times repeated, when, as a final effort, it erected itself to its full height, making a dreadful hissing noise, its head swollen with rage and venom, its eyes inflamed and almost starting from their sockets and its jaws open to the uttermost; but the bird, shielding its body with one of its wings, renewed the attack and struck down its enemy with the bony projection of its other wing; the reptile staggered and fell; the bird was instantly upon it and with one stroke of its beak split open its skull." Afterwards, on dissecting the bird, Levaillant found in its craw eleven good-sized lizards, three serpents, each as long as his arm, eleven small tortoises and a number of locusts and other insects, and also a large-sized ball of undigested matter formed of vertebræ of serpents, lizards, shells of tortoise claws, and shields of beetles, &c. Truth seems stranger than fiction. You have Levaillant's account, not mine.

Night Herons.

Two Garden's Night Herons from the Falkland Isles have just been presented by Mr. W. Grey-Wilson, C.M.G.



WHITE TAILED GNU AND YOUNG.

They are chiefly remarkable for the beautiful marking of the plumage, which, however, leaves the bird when it gets older, and they then assume the usual grey appearance. Although these birds were described officially as Garden's, I notice in the Report of the additions to the menagerie they are now called Dark night herons.

Gibbon.

A SILVERY GIBBON from Borneo has just arrived for the new Ape House, where it has ample space to go through the wonderful acts of "Leotard" gymnastics for which it is well known. The enormous reach of arm and accuracy of judgment, when swinging from one hand-hold to another, is worth watching, and the picture well shows the great length of arm. The difficulty of getting this photograph has only been equalled in my experience with the Cape hunting dog.

HARTEBEEST *(Bubalis caama)*.

Rhesus Monkey.

THE Macacus-rhesus monkey is the one generally found with Italian boys and organ grinders, and, although they may be taught many simple tricks, they never really show much intelligence. If visitors should desire to see one of the fiercest monkeys in the Zoo, they have only to ask to see one of this kind "kept inside" for safety. I should be very sorry to get within his reach. The one photographed is also not quiet enough to be allowed loose in the big cage, so is kept in the corner chained up.

The Hartebeest: A New Arrival.

THE Hartebeest is one of the fleetest and most characteristic of the Ethiopian groups of antelopes, and many a hunter has had his horse succumb in the attempt to run down a hartebeest, which on account of its swiftness and staying power is one of the most difficult of the big game to capture, for even when severely wounded their vitality is so great they frequently escape; this is more remarkable from the fact that the animal is somewhat ungainly. The peculiar curved form of the horns is typical of the Bubaline antelopes. Africa is the great nursery of the antelopes, where they occupy the place which the deer tribes fill in other countries. Why the southern and central regions of Africa are destitute of deer has not, and I am afraid never will be, explained satisfactorily.

The White-tailed Gnu.

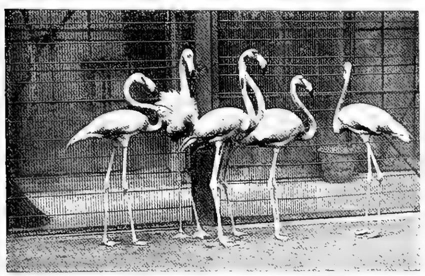
THE White-tailed Gnu (the calf was born in the menagerie) is a very remarkable animal, possessing an extraordinary sense of smell. The peculiar curved horns (which are common to both sexes), and the great width of its naked muzzle, from which long white bristles protrude, give this antelope a very peculiar and fierce appearance. The mother and child shown were so nervous at being photographed that many people would have lost all patience before getting any satisfactory result. It will be noticed that the horns in the calf are quite straight; the curvature outwards and the bend upwards are only developed with age.

Ruddy Flamingo.

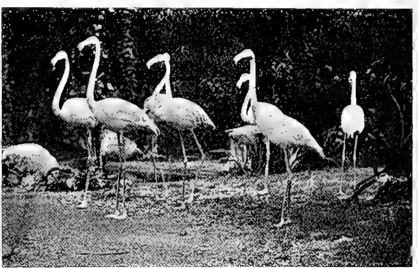
THE Great Aviary has just had a most beautifying addition of six highly-coloured Flamingoes. I was fortunate enough to photograph them the day they arrived, when they were temporarily put into one of the cages of the Eastern Aviary. They soon took to food, and are certainly in very fine condition. Until Swainson pointed out that these birds had the webbed toes of the duck and a bill which was a modification of the duck's, these birds had been for a long time classed with the waders. They are now classed with the swimming birds. These specimens are between five and six feet high.

European Flamingoes.

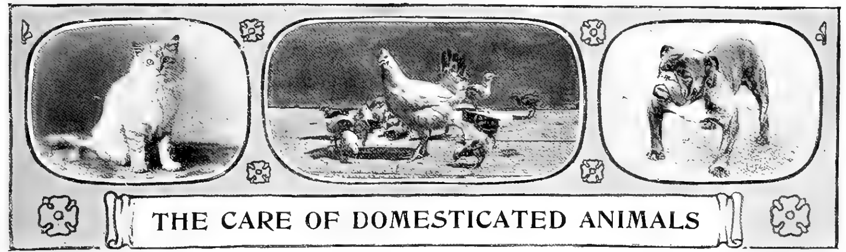
THESE seven birds were photographed in the Great Aviary, and very closely resemble the ruddy, except in colour, which is mainly white with some salmon-coloured wing coverts. What a wonderful sight it must be to see flamingoes in flocks of tens of thousands. Mr. Hulme, who saw them in these numbers on the lake of Sind, describes them as massed upon the water like large rosy islands or hovering above the lake like a cloud at sunset. But one of the most wonderful sights in the world must be "to see one of these enormous flocks rise suddenly when alarmed. As you approach them, so long as they remain on the water at rest, they look simply like a map of faintly rosy snow. A rifle is fired, then the exposure of the upper and under coverts of the wing turns the mass into a gigantic, brilliantly rosy scarf, waving to and fro in mighty folds as it floats away."



RUDDY FLAMINGOES.



EUROPEAN FLAMINGOES.



THE CARE OF DOMESTICATED ANIMALS

By W. M. Freeman.

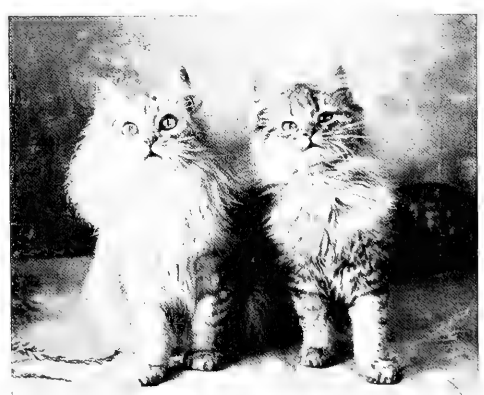
The Cattery.

There is no doubt that the Persian cat is the most delicate variety to keep. Perhaps it is that they suffer from good treatment, but whatever be the reason, it is an undoubted fact that they are very liable to attacks of enteric trouble, and those who take a fancy to keeping Persian cats must therefore make up their minds to diet them on sound lines. To begin with it is very undesirable to feed Persians on sweets and dainties; a little raw meat, fish (which must be perfectly fresh), milk, and *brown* bread which has been made palatable for them by being soaked with gravy—these may be regarded as the staple courses.

Of the several varieties of the Persian cat the two commonest are the tabby and the blue. There is a white variety (sometimes called the Angora), and there are various other colours, but on the whole it will be found that the best to keep is one of the quieter colours. They need constant attention to their coats in the way of grooming; but if a comb and soft brush be used regularly and the cat be not allowed to get the hair into a matted condition, this attention need not occupy many minutes a day.

The Rabbitry.

America is not the native home of the Belgian hare, but it certainly is the adopted home, for the United States is dotted all over with farms where nothing else is cultivated besides poultry and Belgian hares. In England large numbers too are bred, and their popularity is attested by the large entries which the classes provided for them at the live stock shows always draw. The Belgian is as near the wild hare in colour and appearance as any variety of tame rabbit, but requires in the eye of the present-day fancier a ruddy-brown tinge in his coat, which it is understood has been cultivated to a large extent by what is known as "feeding for colour." As a "utility" rabbit he stands very high, particularly in the reputation of Americans, who profess to be indifferent to the merits of any other rabbits, so satisfied are they of the excellence of the Belgian.



Photograph by E. Landor, Ealing.

TWO PERSIAN CATS.

In England this rabbit is largely bred for the table, its principal rival being the Flemish Giant—a larger and more heavily boned variety emanating as its name implies from the Continent. As a pet the Belgian hare will be found to be hardy and interesting. He needs, of course, to be fed rationally—many people who go in for rabbits have but a very vague idea as to how they should be fed. Good white oats and plenty of all sorts of fresh green stuff in the summer, with succulent roots in the winter when green stuff is scarce—these are the natural foods of a rabbit. Bread and milk and things of that sort are not natural foods, and tend to cause disease of the liver.

Photograph by C. Reid, Wishaw.

SILVER GREY DORKINGS.
Good farmyard specimens.

The Poultry Yard.

When these lines appear in print poultry keepers will have two ideas uppermost in their minds. The first is how to get their birds most quickly through the moult, and the second is how to make preparations for the autumn and winter egg basket. These two topics are very intimately connected with each other because the latter depends upon the former. To have a good supply of eggs during the autumn we must get our birds early through the moult and, if possible, induce them to begin laying before the colder weather sets in. It is well known that poultry which start laying early in the autumn as a rule can be depended upon for eggs throughout the winter months, whereas a bird that is late in its moult will not be ready to lay until the cold weather is at hand, and that will most likely have the effect of stopping it altogether, and she will remain unproductive until spring. This is usually the history of old hens, for the older a fowl is the later it begins to moult and the longer it takes in the process; this is why poultry keepers who have had experience always endeavour to get chickens hatched out early in March so that the pullets among them may be fully developed and may have changed their chicken feathers in time to start laying in the autumn. The best way to help poultry through the moult is to keep them very warm and give them daily a little hemp seed and linseed with their regular supply of corn and a little chemical food as a tonic in the drinking water.

The Pigeonry.

Amongst the many varieties of beautiful pigeons known to the fancier there is none more handsome than the Archangel. It is not by any means so widely cultivated as it deserves to be. Especially is it suited for purposes of the country-house aviary—being hardy and requiring none of the attention which the muff-legged varieties of pigeons require. It can be left to itself—will breed freely and is capable of getting its own living just as the blue rocks and other common dove-cote pigeons obtain theirs. The plumage of the Archangel is black and chocolate. The wings and tail are black, whilst the head, neck and breast are chocolate. No coloured plate can

possibly reveal all the glory of its colours in the sunshine. The beautiful greenish sheen which both black and chocolate display are unequalled by the plumage of any other variety. At the back of its head is a little tuft or crest of feathers reversed—not large enough to be termed a "hood," as in the case of the Jacobin, but just sufficient to give it a distinctive appearance. The Archangel does better at liberty than in confinement, although if it is to be used for exhibition purposes it will need to be penned up before the show season comes on.

Photograph by J. T. Newman, Berkhampsted.

THE ROBIN.

The Aviary.

ONE often hears people complain that their canary has left off singing and that he appears to have become asthmatical. One of the most frequent reasons for this is that the owner makes the mistake of hanging up the canary's cage too high in the room with this result: that the fumes from the gas and all the foul air in the apartment which rises to the top gradually work their effect upon the lungs of the little songster and he dwindles and dies. The healthiest place in a room is mid-way between the floor and the ceiling, and when possible the canary-cage should always be placed on a table instead of being hung up between the curtains, as is the usual practice. Of course the bird must not be allowed to remain where there is a draught—there is all the difference in the world between the bird being out in the open air where it can exercise itself and keep its blood warm, and its being shut up in a small cage where it cannot fly about.

Birds' Food.

A large number of our British birds—the majority in fact—are in their wild state insectivorous and cannot be kept in captivity by simply feeding them on ordinary bird seeds. They require insects, or if not insects they must have the nearest substitutes we can get to insect life. There are plenty of these on the market—ants' eggs, dried flies, etc. One of the best things to give insectivorous birds is a little desiccated meat—this can also be obtained in the form of dried meat or "lean meat shred," and in that form is the fibrous product remaining after extract has been pressed out of the meat.

W. M. Freeman

[N.B.—Photographs intended for these columns should be addressed to "The Editor, ANIMAL LIFE, 34, Paternoster Row, E.C."]

ANIMAL BRAINS—WHICH IS THE CLEVEREST ANIMAL?

A contribution towards the solution of this problem by
C. J. Cornish, M.A., F.Z.S., Editor of "The Living Animals of the World."

IT is difficult to devise, even in fancy, any form of capacity-catching examination by which to test the powers of various animal brains. We have not only to think of a test more or less applicable all round, but also to distinguish between natural brain power and the same when developed by education, as, for instance, in the case of the wild and the tamed and trained elephant. To go no further than the case of primitive man, Sir Harry Johnston's second volume on the Uganda Protectorate is almost entirely devoted to the extraordinary phenomena of *human* natural history there exhibited in primitive conditions. In the mass of facts contained in this rough transcript of the ways and minds of these central African races, the following is not the least curious. He found the Forest Dwarfs were a large and widely scattered race, living close to other villages and families of full-sized negroes. These big negroes were agriculturists, built good houses, and were partly civilized, while their little neighbours were stark naked and lived like squirrels or forest animals. Yet when the dwarfs were in contact with white men, and had lived for some time in their camps, they developed a quickness and intelligence far beyond that of the big black agricultural negroes. The same may be and probably is the case with animals. Some have capacity of a high order undeveloped.

Probably the dog and elephant belong to this order of brain. Wild dogs are more remarkable for courage than sagacity, and when kept in captivity have not shown any great intelligence. Domesticated dogs, though uneven in cleverness, undoubtedly share with the elephant the first place as thoughtful servants of man. They are far better able to enter into his *thoughts* than any other creatures, and consequently receive a much larger share of his attention and kindness. There are plenty of stupid dogs, too, but as a rule they have a kind of straightforward common sense which takes a great deal of beating.

Reproduced by permission of Sir Harry Johnston from his work, "The Uganda Protectorate."
A YOUNG AFRICAN ELEPHANT
One of Sir Harry Johnston's pets in Uganda.

As a good example, take the case of a retriever which, not long ago, was sent into a ditch to bring out a winged partridge which had run into it. The dog picked up the scent, rushed along the bottom of the ditch under the brambles, and, after a little groping about, emerged on the bank with an old rusty kettle in his mouth, holding it by the handle. The laughter and chaff

which greeted this performance will please be understood. "Stop a bit," said the dog's master. "Here, Rover, give it to me," and the dog brought the kettle to him. Taking it from his mouth, his master put his hand into the kettle, the lid being off, and took out the partridge. Chased by the dog, it had crept into the kettle to hide, and the dog, not being able to draw it out, just brought the lot.

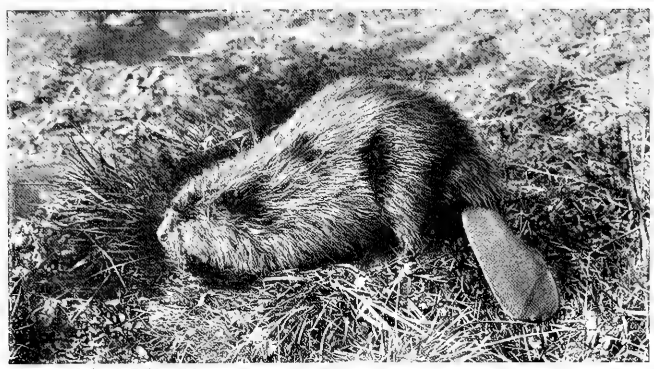
On the other hand, I imagine that the capacity for being taught is greater in the elephant than in the dog. It begins, for one thing, so astonishingly early. In the civilized province of Uganda the natives consented at once to the notion of trying to

Photograph by C. Reid, Wishaw.

FLAT COATED RETRIEVER.

See the Author's story about the Retriever and the Partridge.

tame the African elephant. They caught a little one, not weaned, and brought it to Sir Harry Johnston. In *three* days it was perfectly tame and busy learning the new life. It would come into the rooms without fear and touch and smell the unfamiliar objects in them. Being fed from a bottle, it almost at once saved the men the trouble of holding it. It took the bottle from them in its trunk, held it to its mouth and sucked away till it was empty. Mr. Lockwood Kipling and others rather decry the elephant's natural intelligence, saying that it works so much to order that its services are almost like those of a machine when you turn a handle. They do not say this in so many words, but imply it. I think this is a mistake of a kind not uncommon. No doubt the elephant's actions, controlled by a series of not intelligent methods, is mechanized to any extent. He is so clever in understanding the limits of his teacher that he *makes himself* a machine, working to pressure of the *ankus* and other signs. Horses, used for a very limited number of jobs, like 'bus horses, for instance, become mechanized in the same way. Hence the saying out at the front that the artillery horses, largely recruited from our omnibuses, "wanted a bell to start them." Ponies, which are used



Photograph by C. Reid, Wishaw.

THE BEAVER.

A great animal specialist; his *forte* is engineering.

for all sorts of jobs, are generally much brighter and cleverer than draught horses. Birds are highly intelligent, but their services to man are necessarily so limited that it is not easy to develop their allowance of brains.

There remain two other classes of creature, the apes and baboons and those wonderful engineers, the beavers. Capacity of a kind the big apes have. They can learn to count and to understand much. But they never *do* anything useful, and their life in the great forests is stupid, unintelligent, and dull. The baboons are far different. They have almost the highest social organization among mammals. They post sentries, organize for raids and mutual defence, and are individually most intelligent. But as they are uncertain in temper and dangerous beasts from the size and strength of their jaws, they, again, do not get much chance of development.

The beavers, which make dams across rivers to keep the water at a constant height all the year round, and so to secure a deep pool to swim in and to cover the entrances to their holes, are undoubtedly the cleverest of all the higher animals as builders and engineers. In most respects they are not particularly bright. Like other great specialists, their brains have grown lop-sided.

To sum up, probably the elephant is the cleverest of all animals, both in original capacity and the faculty for its development by education. The dog has most sympathy and occasionally very great intelligence, readily improved by teaching. The beaver is the greatest of conscious animal specialists. (How far ants and insects work by thought is not known; but the beaver evidently *does* think.) The apes and monkeys are too like clever lunatics, and good for little either to themselves or others.

C. J. Cornish.

NOTICE.

Readers are invited to send in for publication any authenticated (and hitherto unpublished) instance of animal intelligence which may have come under their notice—if accompanied with a photograph so much the better. Other contributions, literary and photographic, are cordially invited. Intending contributors are requested to refer to page 5 for information regarding MSS., etc.

Owing to the pressure on our space the monthly Notes and Comments have been unavoidably held over from this issue.

THE PERIOPHTHALMUS.

WILD BEASTS AND THEIR WAYS.

The second of a series of articles on popular Zoology.

By Sir Harry Johnston, G.C.M.G.

II. THE GREAT CATS.

Photograph by W. P. Dando, F.Z.S., Regents Park.

SKULL OF MAN-EATER.

Shot at Lwonde, B.C.A. Killed seven women and one man.

IN Africa at the present day the cat tribe is represented by specimens of all its principal existing divisions. The lion and leopard are examples of the "great cats." The caracal, serval, and servaline* illustrate the lynx group. The jungle or "Kaffir" cat is a type of the "small" cats (from which our domestic pussy springs), and, lastly, there is the cheetah or hunting leopard, which is the only surviving representative of a second genus in the cat family, a genus exhibiting in some respects a less degree of cat-like specialisation. From its size, however, the cheetah may be spoken of as a "great" cat, and I propose, therefore, to include it in the following notes on the great cats of Africa.

The lion at the present day has the following area of distribution:—In Asia: the northern part of the Kathiawar Peninsula (Gujarat, Western India), South-Western Persia (Provinces of Luristan, Khuzistan, Farsistan, and Kerman), and the valley of the Tigris in Mesopotamia, from near Mosul on the North to the Shat-al-Arab (Euphrates estuary) on the South. In Africa: the slopes of the Atlas and Anti-Atlas in South-West Morocco, a small portion of Western Algeria and the Aures Mountains in the eastern part of that colony; the interior of Senegambia and all Nigeria outside the Forest Zone; the Central Sudan (Baghirmi, Kanem, Wadai, Darfur), portions of the Nyamnyam country and the grassy areas of Northern and Southern Congoland; Nileland, south of Khartum (except in the swampy districts), Western and Southern Abyssinia, Somaliland, and much of the Uganda Protectorate; all East and East Central Africa from Somaliland to the Upper Zambesi (except in the settled districts), Rhodesia, Damaraland, and the southern parts of Angola; in short—negatively—wherever there are not hopeless deserts, dense forests, extended swamps, or the presence of resolute people armed with guns; and—positively—where there is a sufficiency of wild game or unguarded domestic animals. But the range of this great maned cat was once far wider. The present writer, in 1880, saw lions killed in North-Western Tunisia. They did not become extinct in that

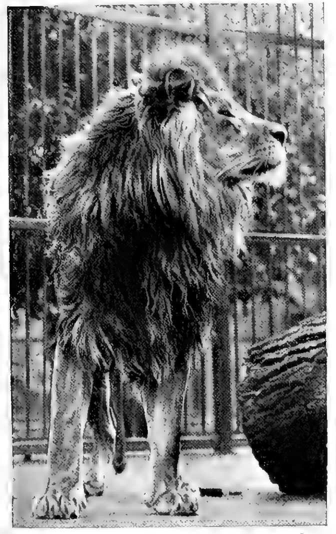
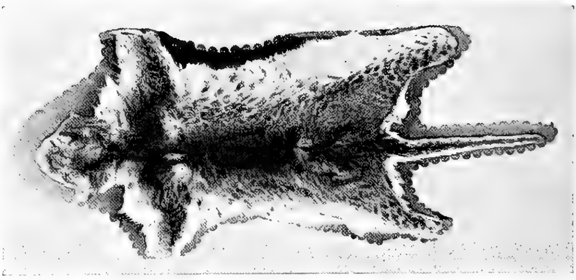


Photo by W. P. Dando, F.Z.S., Regents Park.

LION.

* The serval and servaline cats are not true lynxes, but exhibit some lynx-like features.

Regency till about 1895. The last lion was killed in Tripoli about 1850. When the French landed at Algiers, in 1830, lions were common all over Algeria, except in the absolute sandy desert.



Photograph by W. P. Dando, F.Z.S., Regents Park.

SKIN OF LION CUB.

Shot in British East Africa. To show leopard-like spots

In the 18th century lions were found in India from the Panjab* and Sindh to the Dekkan and Madras. In the Crusaders' times—still more so in the days of the Old and New Testament—the lion was met with in most parts of Syria and Palestine, in North-Western, South-Western and Eastern Arabia, as well as continuously through Southern Persia† and Baluchistan, from Mesopotamia to the Indus. In the southern and western parts of Asia Minor, in the adjoining Balkan Peninsula and Northern Greece, the lion still lingered in historic times and, as we learn from Herodotos, preyed on the camels of the invading Persian armies. In *pre*historic days the range of the lion extended (prior to the Glacial epoch) across Central Europe, France, Italy and Spain to our own country of England,‡ but apparently not to Ireland, where he is now bred so successfully in captivity. The existence of a British lion was brought home to me once with vividness. I was bicycling round the beautiful Mendip Hills in Somersetshire and visited the remarkable caverns of Wookey and Cheddar. The old owner and guardian of the Cheddar caves, hearing I was an African traveller, said to me, "Do you recognise these?" He pointed to a fine skull of a lion and the skull of a leopard, both of them dug up a few days before in local excavations, and both looking as though they might just have been brought from Africa, for they were only slightly stained by infiltrations from the soil in which they had long lain buried. The British lion differed but little in size or shape from the lion of to-day, but he possibly had less mane and was spotted all over his buff-coloured pelage. His fur was variegated with the single spots, rosettes and chest stripes of the leopard. On the limbs and belly these markings were in black, elsewhere in a dark chestnut brown. The mane bore no trace of definite spots. When it first developed from an exaggerated whisker growth of hair (such as one sees in lynxes and tigers) it was faintly striped. The lion, in short, is but a huge development of the leopard, and retains to this day (in his cub stage) the leopard's spots and rosettes almost unaltered in shape and arrangement. Gradually the spots have

Photograph by W. P. Dando, F.Z.S., Regents Park.

SKIN OF LION CUB. To show spots.

* Even so late as 1832 Captain Mundy notes the abundance of lions in the country north-west of Delhi.

† Northern Persia and possibly Pontus and South Caucasia were the domain of the tiger. Northern Persia is still.

‡ As far north as the North Riding of Yorkshire.

Photograph by Fratelli Alniari, Florence.

TWO YOUNG LIONESSES.

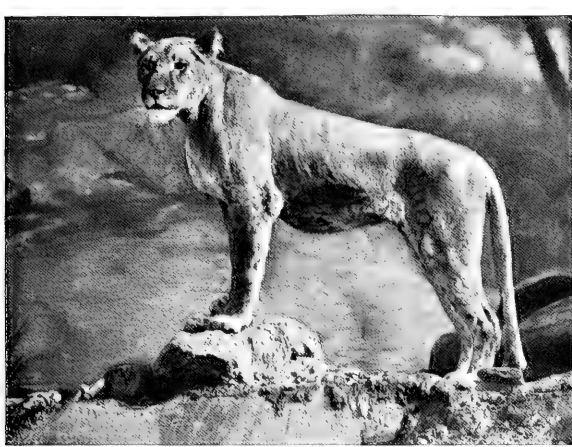
faded from black to chestnut, and from chestnut to yellow brown, while the ground colour of the fur has darkened to buff or greyish brown. The tail has shortened and the head has increased in size, developing a long and powerful muzzle. Structurally, perhaps, the lion is a little nearer to the leopard stock than is the tiger. The immediate parent of the tiger may have been some jaguar-like development of leopard, which, like so many of the Asiatic types, found its way to America and died out in Asia, developing in Eastern Asia into the much more formidable tiger. The ranges of the tiger and the lion formerly overlapped in India, otherwise they divided the old world pretty equally between them, the tiger occupying (at one time) all Northern Asia, North Persia and Pontus, Afghanistan, India, Malaysia, Sumatra, Java and China, while the lion became the king of carnivores in Western Asia, Central Europe, and nearly the whole of Africa.

It is a mistake to say the lion cannot climb. He dislikes trusting his heavy body to an insufficient support far from the ground, and he would find poor satisfaction as prey in the small mammals and birds which haunt the trees; but, at a pinch, the lion or lioness can scramble up a slanting tree trunk. From such a point of vantage as the fork between the branches, some ten or fifteen feet above the ground, a lion or lioness may not infrequently scan, with roving eyes, the surrounding country, and having located game, descend noiselessly and stalk its prey through the brushwood or long grass. Mr. Alfred Sharpe, the Commissioner in British Central Africa, shot a lion who was perched up in the branches of a tree in this manner, and saw other instances in the same district (Tanganyika) of lions ascending trees. Similar stories are related in the Uganda Protectorate by natives; also in Nyasaland, in parts of which country the lions boldly attack the natives in their villages by climbing on to the roofs of their houses, tearing open the thatch and stick framework, and descending with a flop on some poor huddled group of husband, wife, and child. The terrified negroes did not dare to flee from the lion on the roof, because they were well aware that other lions or lionesses were waiting outside the dwelling ready to pounce on them, even, it may be, trying to break down the reed or palm-frond door. I have passed several deserted villages in West Nyasaland, in the days before guns were widespread in use, which had only been abandoned by the people because of the bold and persistent attacks of lions during the night, and even occasionally in broad daylight. It is not too much to say that gunpowder or the white man, or, in desperate cases, both together, alone have quelled the lion plague in parts of Eastern and Central Africa, and have rendered repopulation of deserted districts or settlements possible on the part of negroes. I can at the time of writing recall villages on the banks of the Shire

Photograph by W. P. Dando, F.Z.S., Regents Park.

LION.

river and near Lake Pamalombe (British Central Africa), which in 1889 were devoid of inhabitants owing to the terror created by one or more man-eating lions. In West Nyasaland and in parts of East Africa I have heard of *troops* of lions invading and ravaging villages on occasion, no doubt when four-footed game was scarce, and these lions were of both sexes and generally in the prime of maturity. But along the Shire river and elsewhere it was usually one individual—an oldish beast and solitary—which would make a particular village its special hunting ground. Some twice or thrice a week its toll was exacted—women usually, an old man or a child when nothing better offered, or a young man if he were alone and could be taken off his guard. The hiding place was seldom the same twice running. One day it would be near the water where the women went to fill their water-jars—a waving of the fleecy-plumed reeds, a rush, many screams (one with a note of agony in it), many broken pots, and one wretched woman dragged away by the head into the reed jungle: thence it may be (for the lion's greater ease of mind) into the jungle of date palm, euphorbia, and thorn bush. At another time the lion crouched amid the partially-burnt black and yellow grass stems by the roadside, half-a-mile from the village. A young man is returning from hunting; he has despatched with his spears an antelope in a pitfall, and is coming back with a haunch of venison, his companions perhaps far behind. The prospect of a good feast, of *wein* (in the form of palm-sap or maize-beer), *weib und gesang*, makes his jolly countenance glow as he faces the rosy sunset, his range of view circumscribed by the reeking haunch across his shoulder; he is thinking of everything but of a lion or imminent death, when . . . *rush* . . . a brief appalling sound, half snarl, half roar, and he is tumbled over with a smashed skull.



Photograph by Fratelli Alniari, Florence.

LIONESS.

The people of this village were strangely apathetic about the question. Fish was abundant in the adjoining river; the soil of their gardens, yearly inundated with river mud, yielded magnificent crops, and then a curious superstition clogged their vengeance. It was surmised that the man-eater was a "were" lion and could not be fought against by ordinary weapons; it was either the spirit of a dead chief animating the lion's body or one of themselves—some monster who could at will assume a lion's form to slake his thirst for blood.* But though they had ceased themselves to attempt the destruction of the man-eater, they were anxious for the white man to make an effort. The lion, however, was cunning enough to know that a new and more efficient force had appeared on the scene, and he disappeared for some time. At last, however, he was tracked down

* At this period in Nyasaland (if not also now) there were not infrequently cases of negroes believing themselves to be lions and lying in wait for their unsuspecting victims, whom they killed (with knives and clubs) and partially devoured.

and killed by an official appointed to reside at the village as assistant collector, and his skull was sent to me by Mr. Alfred Sharpe. A photograph of it is given on page 81. Just prior to its well-merited death it had killed seven women and one man. It will be noticed that the teeth are in good condition and *not* worn out and broken, as is thought to be the case in all confirmed man-eating lions and tigers.

Lions do a great deal of their hunting in company and, apparently, sometimes on a prearranged plan. Thus part of the band may lie in ambush while the remainder appears in the open and drives the game past the hidden comrades. On such occasions the lions *do* roar before their meal, roar deliberately, with the idea of unsettling their intended prey and causing it to run hither and thither in a panic-stricken state. All unheeding, the terrified animals, no longer stopping to sniff the air, pass in front of some hidden lioness or young lion and are at once pounced on.

Photograph by] [*Percy Ashenden, Cape Town.*

LION.

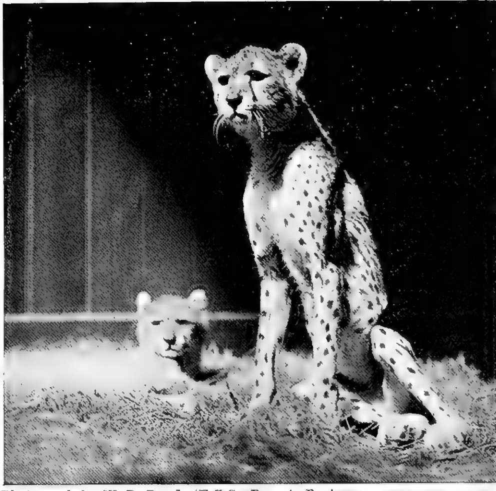
Just as the lion can at a pinch climb up a sufficiently broad and sloping tree-trunk or scale a crumbling cliff, so the leopard, deemed arboreal in its habits, is as terrestrial as the lion in open country. The leopard, unlike the jaguar, has no great liking for pursuing his prey in the branches of the trees. He gets the reputation for leading a much more arboreal life than he really does—even in forests—from his habit of lying concealed on the horizontal branches of trees overhanging some path or the approach to water. From this post of vantage he leaps on his unsuspecting enemy—the human being, antelope, baboon, pig, or buffalo-calf that passes beneath. In open country, however, the leopard usually lies in long grass, waiting in ambush for antelopes. In this position the long tail is often curled upward, and its heavily-furred tip waves to and fro above the grass stems. Antelopes are inquisitive to the last degree. In spite of any scent of leopard which may be in the air they advance and advance with outstretched head and quivering limbs until—for one of them—it is too late; the three or four bounds of the leopard have landed him on his victim.

At a little distance the markings of a leopard (like those of a zebra) are quite indistinguishable. He appears to be a brown animal, and is only (as a rule) picked out from the surroundings by the light and shade of the sunlight. Sometimes I

Photograph by Ottomar Anschutz, Berlin.

CHEETAH.

have mistaken leopards bounding through herbage for female (and therefore hornless) reedbuck and so have missed an easy shot; both creatures when in first flight giving the same loose-jointed, shambling leaps. On other occasions I and others have pronounced a full-grown leopard to be a half-grown lioness, so completely monotonous in colour becomes the leopard's fur in sunlight and at a distance of over fifty yards.



Photograph by W. P. Dando, F.Z.S., Regents Park.

CHEETAHS.

The cry of the leopard at night is a short coughing "Augh!" "Augh!" sound, apparently partly uttered through the nose. Whether it is the male alone that makes this noise I cannot say any more than I can determine why he makes it at a time when he must desire to steal on his prey unobserved. Perhaps it is done like the lion's roaring, to fluster and perturb timid creatures who in their panic may reveal their whereabouts by uneasy movements. When leopards are breeding they give vent to miauling sounds very like cats on the tiles. Noises of this description were heard one afternoon only a mile from one of our camps on the Mau Plateau, and an official of the Uganda Railway going to investigate saw the magnificent spectacle of a leopardess Circe surrounded by seven leopards, each eagerly soliciting her favourable notice. He fired and killed one of the expectant bridegrooms, whereupon the rest vanished into the adjacent forest.

Leopard cubs when in their babyhood are rather ugly little things, with short pointed tails and a fur of a dusky greyish brown, suggesting but faintly the future spots and rosettes. In fact a leopard does not attain to a handsomely spotted skin till he is a year old. Like the lion he does not reach anything like maturity (in the male) till the age of three years. A very curious (and seemingly new) variety—if not sub-species of the leopard—is found in Northern Cape Colony and perhaps in Basutoland. It is of large size, but the rosettes have changed into innumerable tiny black spots thickly scattered over the rather umber-tinted fur of the upper parts. The bold black stripes of the throat and the black spots on the white belly are retained. In fact it is a parallel case to the Servaline Cat, which differs only from the common Serval by the substitution of many little spots on a dusky ground for the large clear black spotting on yellow. It would almost seem as though (but for the hindrance of man and his attempts at exterminating) a new species of leopard on rather leonine lines was being developed under our eyes in South Africa. With this exception the leopards of all Africa, and of India, Ceylon and Malaysia, are absolutely indistinguishable in appearance, size, and markings, though all these regions offer two distinct and similar types, according as the leopard in question inhabits the open or the forest country.

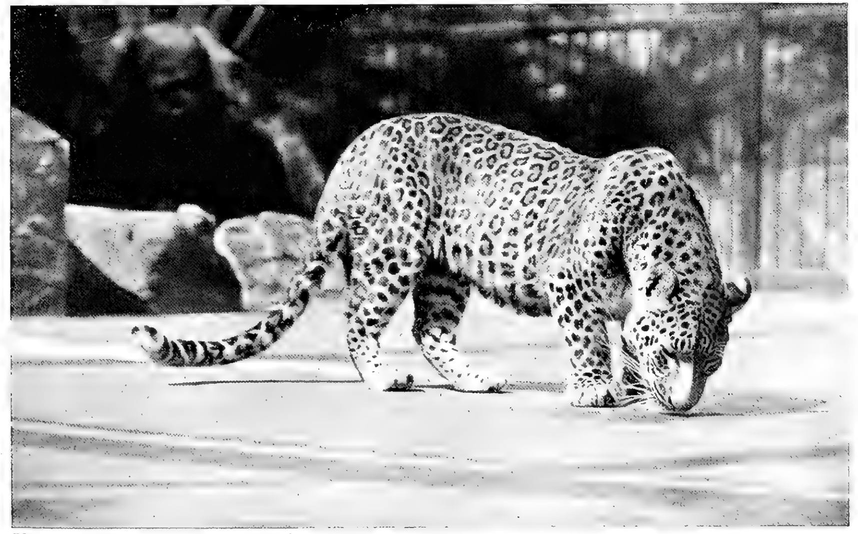
The leopard of the grasslands is a large beast, occasionally approaching a small lioness in size, with short yellow fur marked very clearly with distinct but not large rosettes. The forest-dwelling leopard of Africa and Southern Asia is slightly smaller,

with a very long tail and with a coat the ground colour of which turns rather more towards grey than yellow, but has very black and broad markings—slightly more jaguar-like. The leopard of the open country has a bigger and more leonine head, proportionately, than his congener of the forest. The leopard found in Sinai, in Syria, in Persia, Afghanistan, and China is almost a distinct variety with more greyish-whitish fur, marked with larger rosettes and bigger spots. It is, in fact, a distinct link between the ordinary leopard and the ounce or snow leopard.

Strangely enough the word "leopard" is really the old Latin designation of the cheetah (*Cynœlurus jubatus*). The Romans called the true leopard *Pardus* and *Panthera*, and the Greeks, *Pardos* and *Panther* (panther).* The cheetah was new to them, never possibly having inhabited Europe, at any rate since the Neolithic period. The first cheetahs appear to have been brought to Rome from Northern Africa,† and with their rather leonine aspect (due to the short mane) were believed to be hybrids between lion and panther (*Leo-pardus*). The Crusaders encountered them again as tamed animals among the Saracens of Syria and Egypt, and the tradition of the Latin name (*Leopardus*) still lingered. As like as not the Leopards of England are the cheetah. The name, however (in early English *libbard*), soon began to be misapplied to the panther, as the latter—far commoner—became better known. We regained knowledge of the cheetah through Western India, where it is semi-domesticated, as it was formerly by Egyptians, Arabs, and Persians. Curiously enough *chita* or *chhita* (the origin of *cheetah*) in Hindustani merely means "panther," so that the confusion in nomenclature between these two large spotted cats (which generically are so wide apart) remains hopelessly confounded. Although so much associated with India, the cheetah is really more African than Asiatic in its range at the present day, though it is found fossil in the Panjab

* Both words.

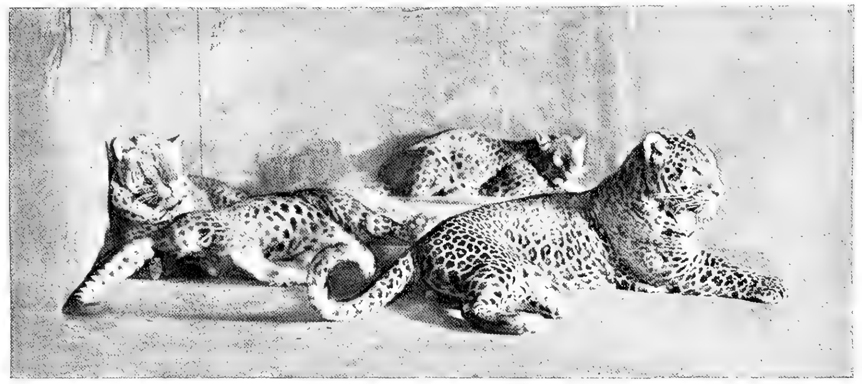
† I have shown elsewhere in writing about Tunisia that the cheetah still lingers in the region of the Shats, just north of the Tunisian Sahara. It is very common in Fezzan, and was anciently found in Central Tunisia and in the Tripolitaine.



Photograph by W. P. Dando, Regents Park.

LEOPARD.

(Siwalik hills), and no doubt, like so many other modern mammalian types—lions, tigers, antelopes, giraffes, oxen, apes, and man himself—originated in that laboratory of creation, India. At the present time the cheetah is found in all the uncivilised parts of Africa which are of an arid character yet able to sustain gazelles and other antelopes. Thus it inhabits Southern Tunis, Tripoli, and the outskirts (north, south, and east) and the oases of the Sahara desert; Kordofan, the Egyptian Sudan, Darfur, Nileland, the lowlands of Abyssinia, Somaliland, the drier parts of East and East Central and, though now partially exterminated, nearly all South and South-West Africa. South of the Zambesi, on the colder uplands, the cheetah develops a variety which may be on its way to form a new species—the "woolly" cheetah, with thicker fur and spots that, instead of being black, are chestnut-brown. In Somaliland and Abyssinia the cheetah is often caught when young and tamed, till it is as domestic and friendly as a dog.



Photograph by Fratelli Alniari, Florence.

A GROUP OF LEOPARDS.

The colouring of the cheetah cubs is somewhat remarkable. The ground colour of their body fur is grey (not yellow as in the adult) spotted with black; there is a very distinct mane of long hair over the shoulders and neck, and this is palish yellow, marked with longitudinal spots or short streaks of brown. The tails of the cubs are short, much shorter than in the adult.

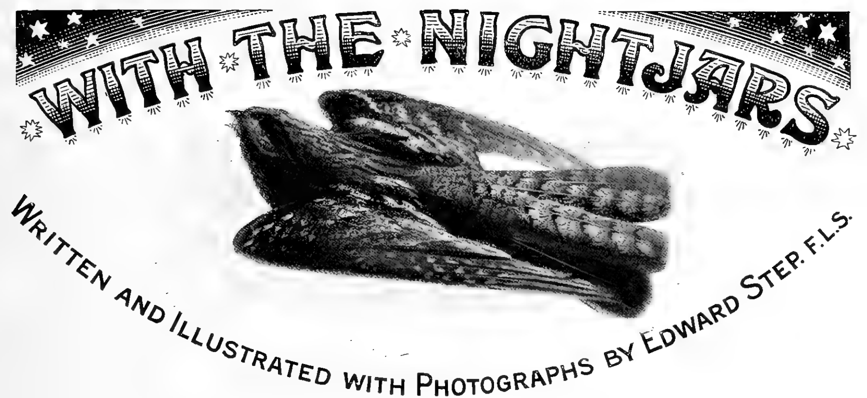
H. H. Johnston

The next article in this series will deal with African Antelopes.

A CROW-HATCHERY.

From America comes the report that a crow-hatchery has been started to supply big millinery houses with crows' wings and heads. The hatchery is at present comparatively small, as, owing to the extreme shyness of the birds, the owner has succeeded in capturing and raising only about two hundred of them, but next season he expects to have two thousand on hand. They will be carefully protected and liberally fed. A ready sale at 50 cents. for each head and 25 cents. a pair for wings is expected.

WITH THE NIGHTJARS

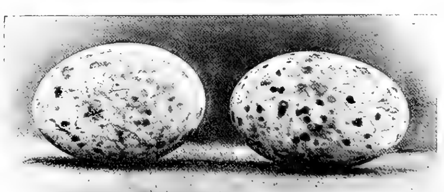


WRITTEN AND ILLUSTRATED WITH PHOTOGRAPHS BY EDWARD STEP, F.L.S.

FROM time to time we hear much of the immigration of aliens to this country. It would be interesting if some of our industrious statisticians would show us in figures of number and £ s. d. the results for good or evil of that greater movement of aliens to our shores that sets in with unfailing regularity at certain seasons of the year. Some of the visitors come to keep up the vigour, and improve the strain by crossing, of many of our direst insect foes. Others, as the nightingale, are popularly thought to come solely for the purpose of making our woods perfect with song at just that period of the year when we can best enjoy an evening stroll beneath the boughs. But not all these songsters are aliens, for many of them first saw the light in the very woods to which they have returned after an eight months' absence.

Among those philanthropic migrants who come for nothing we ourselves value or want, and who do nothing but good to us throughout their brief sojourn, must be reckoned that weird bird, the Nightjar; and he must be put in the front rank of our friends. From the day of his arrival in May until his return to North Africa in September, he wages war upon certain of our enemies which constitute his entire food. He does his work, too, in the evening, when there are no other creatures to speak of preying upon the moths and beetles that fly at twilight. It cannot even be alleged against him that he makes us pay for his help by taking toll of our fruits and seeds; he is strictly insectivorous, though an ancient slander charges him with milking goats.

Country folk who live on the borders of woods and heath-clad moors regard him as something uncanny, and really this is not to be wondered at. Their ideas have to some extent been embodied in the local names they have bestowed upon him. It is clear from these that they have had some difficulty in placing the bird in their rather elementary systems of classification; but they have done their best. Because of the small portion of beak that projects from the abundant plumage they have been tempted to place him among the owls, and have called him fern-owl and churn-owl. Because of his size, his barred and mottled feathers and his flight, they have styled him a hawk—night-hawk and



THE NIGHTJAR'S TWO EGGS.

dor-hawk. Other names—eve-churr and nightjar—have obviously been suggested by his characteristic note, the long continued vibrating "chur-r-r" set up after the sun has gone down.

What is the purpose of this strange vocal effort is not known. It cannot be classed with the song of the nightingale and other birds that sing for the delectation of the female whilst she is engaged in the tedious business of incubation, for it is continued long after the eggs have been hatched, in fact right up to the time of the bird's departure from this country.

A heath well-clad with fern, furze, and the other characteristic vegetation of such places, and surrounded by woods, is the favourite haunt of this bird. There in the twilight they may be seen, sometimes to the number of a dozen or a score, flitting and sweeping in huge circles through the air, catching the moths and beetles that are then enjoying to the full their possession of wings. The nightjar has been likened to a great moth, and the resemblance is by no means slight. It is one of the finest examples of protective colouring afforded by the larger wild creatures of this country. It is not a simple task to describe this colouring in a few words, for there is no definite pattern; spots and streaks and splashes of browns, yellows and blacks appear as though laid on haphazard, and yet they produce a very harmonious effect that fits in with any of their usual surroundings. Like many other examples of protective colouration, its beauty cannot be fully appreciated in a museum specimen divorced from its ordinary environment. Set it down on the moorland among the heather, and at once it becomes practically invisible. The stones, the lichens, the dead twigs, the sprays of heath and the spines of furze are all figured on its plumage, and these counterfeit presentments unite with the real things around them so completely that you cannot readily see the points of junction between the actual and the apparent.

NIGHTJARS JUST HATCHED.

On page 95 is a photograph of a young but full-fledged bird among heather, with which it harmonises so well that I have had to subdue these surroundings in order that the representation of the bird may be fairly distinct. Strange to say, assimilative colouring is equally effective for protective purposes when the bird squats toad-like on the limb of a tree. The nightjar perches *along*, not *across* the branch as most birds perch, and the darker lines and spots on its plumage then harmonise with the cracks and irregularities of the bark and the lichens upon it. The wings are drooped to the bird's sides, and so connect it with the tree that it might easily be mistaken for a mere natural excrescence such as are commonly found on trees.

The habits of the bird have given natural selection full play throughout its life. It lays its two eggs upon the ground, selecting some bare spot among heather or fern, at the foot of a fir tree or under a furze bush. There is not the slightest pretence at making a nest, not even to the extent of scratching a hollow, though sometimes

NIGHTJARS THREE DAYS OLD.

YOUNG NIGHTJAR AT REST ON TREE.

an existing slight depression will be utilised. In such a situation it will be evident that, as in the case of the partridge and other ground birds, the individual that does not closely assimilate with its environment runs considerable risk of being seen and killed; so that any of these birds varying towards more conspicuous colouration stands little chance of transmitting the variation to another generation. On the other hand any variation that brought one into yet closer harmony with its surroundings would make it more certain than its fellows of rearing its young without disturbance.

This protective colouration begins at the very beginning. The average rambler across the moor might see the nightjar's eggs close to his feet, but he is not likely to take them for anything but whitish stones. I need not attempt a description of these eggs and their markings, for the photograph gives a better idea than my words would. I will only say that the ground colour is white, overlaid with spots and veins of ashy-grey, purple-brown and black. This ornamentation probably explains why no nest is made. In a nest these eggs would certainly be noticeable for what they are, but on the bare ground, possibly with a few pebbles or bits of chalk or sandstone around, they are merely oval stones.

It has been stated that incubation takes from sixteen to eighteen days. If you come upon the bird engaged in this task, with her breast and beak turned towards you, it is more than probable that you will take her for the broken butt of a decayed branch. When only a few hours out of the egg, the young birds are shapeless balls of sooty-grey down.

On the 21st of July I had the good fortune to find a couple of nightjar chicks that—judging from the condition of the egg-shells—had been hatched that morning. I probably should not have seen them but for the characteristic action of the mother-bird, who rose from my feet and fluttered slowly over the bracken tops with her right wing hanging down as though injured. But I was well acquainted with this artifice, and immediately looked to the ground and saw the fluffy chicks. They remained perfectly still and silent whilst I adjusted my camera and photographed them; but afterwards, the mother-bird, from the oak to which she had retired, not liking the look of this strange engine, uttered a peculiar warning note, and instantly the youngsters got upon their feet and ran into the heather, each taking a different

direction. The photograph shows them before this dispersion, with the fresh egg-shells in close proximity. The next day the chicks were back in the same spot, but the tell-tale egg-shells had been taken clear away. On the 24th, I was looking for them again, and should have walked over them, but for the mother-bird rising up and flying off in the same manner as before. Then finding that her pretence of lameness made no impression upon me, she wheeled round close to me several times, wearing her most hawk-like and threatening aspect, before settling upon the oak and flapping her wings, apparently in great distress. She called at intervals to the youngsters, but they made not the slightest movement and might as well have been museum specimens for all the signs of animation they gave—from which I gathered that she was urging them to remain still. I continued to visit this interesting family daily, and marked the rapid development of the young ones; but always the mother-bird went through the same tactics as on my previous visits.

On the last day of July my daughter reported that the nightjars were no longer in their accustomed place. Searching for them next day, I found they had been removed to a spot among the heath-plants a few yards away. The old bird flew off in her usual manner and the young ones remained as still as stones. On taking them up to examine their plumage, they hissed at me with considerable vigour and expressiveness. They were now quite covered with feathers, though a little down still remained, as well as the sheaths of the back feathers. To my surprise they stretched their long wings and flew off—one about thirty yards away, the other at least sixty yards, to the young oaks where its mother was sitting. That was the last I saw of that family.

One day, when wandering over the hills among the heather and bracken, I started up a young nightjar. It fluttered before me to a little distance, then wheeling sharply to the right, it lay with half-extended wings across a bracken frond, looking

YOUNG NIGHTJAR AMONG THE HEATHER.

THE HAUNT OF THE NIGHTJAR.

so like a bunch of withered leaves that had I not followed its flight with my eye, I should have lost track of it. I picked it up and placed it inside my cricketing shirt, and carried it for three and a half hours. On arrival at home I offered it a large noctuid caterpillar from the cabbage-patch, but as it showed no knowledge of picking for itself, I gently opened it mouth and dropped the grub down its throat. It appeared to take this little attention as being quite in the natural course of things, and gulped down the larva into its crop. The bird then sat quiescent for hours upon the doormat, with its eyelids all but closed, and showing no desire to escape through the wide-open door. In the evening I saw an old nightjar flying over the garden, and imagined this might be its parent that had followed us home; so I placed the young one upon the tiled roof, up which it quickly sped to the eaves of a higher roof at a right angle with the lower one, and there it stayed until late. Next morning it had gone, and I concluded that the old bird had induced it to depart. Two evenings later, however, our neighbour, Billy, the keeper, said to me, "I know where your eve-jar is," and he led me to the sandy road just outside the garden fence. There, in a rut, lay the nightjar, but on our approach it rose up and wheeled across the garden. For about a month the bird haunted the garden and the fern-clad slope outside it, occasionally showing itself by day when it was flushed from among the cabbages or from beneath the leaves of the marrow bed. In the evenings it frequently circled about the garden, uttering a modified "wi-ep," but it had not acquired the power to "chur." I was delighted to note its constancy, for the bird had been quite friendly and fearless whilst in my possession, and had even kindly allowed me to photograph it without resenting my action. The photograph of the bird among the heather, and that showing how it harmonises with the bark of an old oak, were both taken with the aid of this obliging individual, who was entirely unfettered and could have made a successful dash for liberty an he would.

When speaking of the nightjar's varied names in the vernacular, I omitted perhaps its best known, though an utterly misleading one—goat-sucker. This is an exceedingly ancient name, and was given to it in ignorance of its true nature and habits. It was doubtless suggested to the Ancients on seeing the bird flying low about their herds of goats what time it was scooping up the beetles and other flying insects. Man is a suspicious creature and is ever imagining that the other animals are getting some advantage over him. Prizing milk and despising moths and beetles as food, he attributed identical tastes to the nightjar.

Edward Step

THE LIFE STORY OF THE DRAGON FLY.

Fig. 1.

By

FRED ENOCK,

F.L.S., F.E.S.

Another remarkable article on one of Nature's marvellous transformation scenes, illustrated with a series of photographs taken by the author.

THE Dragon Flies of Great Britain are not so numerous as to be bewildering; at present, only forty species complete the list and of these many are exceedingly common. There is scarcely a pond or ornamental water in the London Parks where some are not seen. From the top of a 'bus I saw one of the largest species circling around the smoke-begrimed walls of the Bank of England! Those who delight in the study of the "Devil's Darning Needles!" (a wise man, he who first gave dragon flies this most expressive name) know where to find some of the best; so let us, in imagination, take as many of our readers as possible to the Black Pond on Esher Common. I would strongly advise my naturalist companions before they begin dredging for nymphs to provide themselves with a good pair of india rubber boots reaching to the knees; they are comfortable to walk in either along a dusty road or into a shallow pond without the risk of getting the feet wet.

Armed with a stout iron ring net made of "cheese cloth," tin boxes of various size and shape, especially a shallow one (which can first be filled with sandwiches), and you are ready for your onslaught upon the nymphs in the pond. Cautiously stepping into the pond, we suddenly thrust our net underneath a quantity of American pond weed, lift up as much as we can and land it upon the level path; three or four of the workers squat around and turn over the weed, from which all kinds of nymphs crawl out. After this has been well searched it should always be thrown back into the pond or innumerable small insects and eggs will be destroyed.

After we have well worked the tufts of weeds we should do well carefully and quietly to draw to land any piece of floating stick or uprooted reed, on the under side of which nymphs are exceedingly fond of taking shelter; any sudden jerk and in a moment the nymphs literally shoot off into deep water far beyond the reach of nets.

Fig. 2.

Fig. 3.

A long day at the end of April always seems too short for a dredging expedition at Black Pond; but our pleasures are not at an end, for at home we have prepared a number of bell glasses with growing water plants for the reception of our captured nymphs, where, though surrounded with unnatural environment, we are enabled to watch their habits and development at leisure.

They soon make themselves at home if supplied with a liberal diet of small worms, which the nymphs seize with a convenient "catcher," termed a mask. This is somewhat like a miniature quick extension ladder attached to the under side of the throat, from which it projects back, resting just between the front legs, where there is a sharp angled joint, the forward and longer part terminating with a shovel-shaped double-action clipping machine. On the appearance of a worm or other kind of prey the nymph sneakingly creeps near to within striking distance, when like a flash the extension is shot out, the worm seized, and as rapidly the action is reversed, the extension drawn in bringing with it the prey, which is brought under and in fact right between the true mandibles. It is interesting to watch this wonderful arrangement at work upon a worm, and absolutely exciting when the other end is seized by another nymph, resulting in a terrible tug of war.

Fig. 4.

Fig. 5.

Fed and fattened upon such diet, they soon arrive at maturity, when their dull eyes assume a golden green colour and they protrude their heads above water for a day or two, slowly climbing up some leaf stem until they find a suitable spot where, on the under side, they "take hold" firmly with their sharp claws, driving them into the cuticle, their body hanging down.

Now that most wonderful of all changes is about to take place; the nymph having completed its one or two years' sojourn in the water as a wingless worm-eating "grub," will shortly assume the glorious one of a winged insect—and such wings! the most delicate gauze-like structure held together by miniature girders and cross bars that put all our modern scientific conceptions far into the shade.

Let us take one example of the blue and green bodied dragon flies, *Brachytron pratense* (I am compelled to use this name, as there is no distinctive English one), which at 10 a.m. as a nymph was wandering about in the water, searching for a convenient twig or leaf stem up which to crawl and go through its final transformation. After considerable time spent in going up and down and round about, it at last found a vacant place between the two "old husks" on the right, from which, as well as from those attached to the opposite twig, similar species have emerged. Here, as seen at Fig. 1, it fixes its claws firmly into the rough bark and hangs for some time until the moisture has drained off its body. Almost imperceptibly it is making internal muscular effort to burst its skin just at the back of the head and thorax; this it succeeds in doing at 10.42 (Fig. 2), where a small tuft of down is seen protruding from between the vertical slit, followed by the swelling thorax (Fig. 3); a minute later and the head is free (Fig. 4).

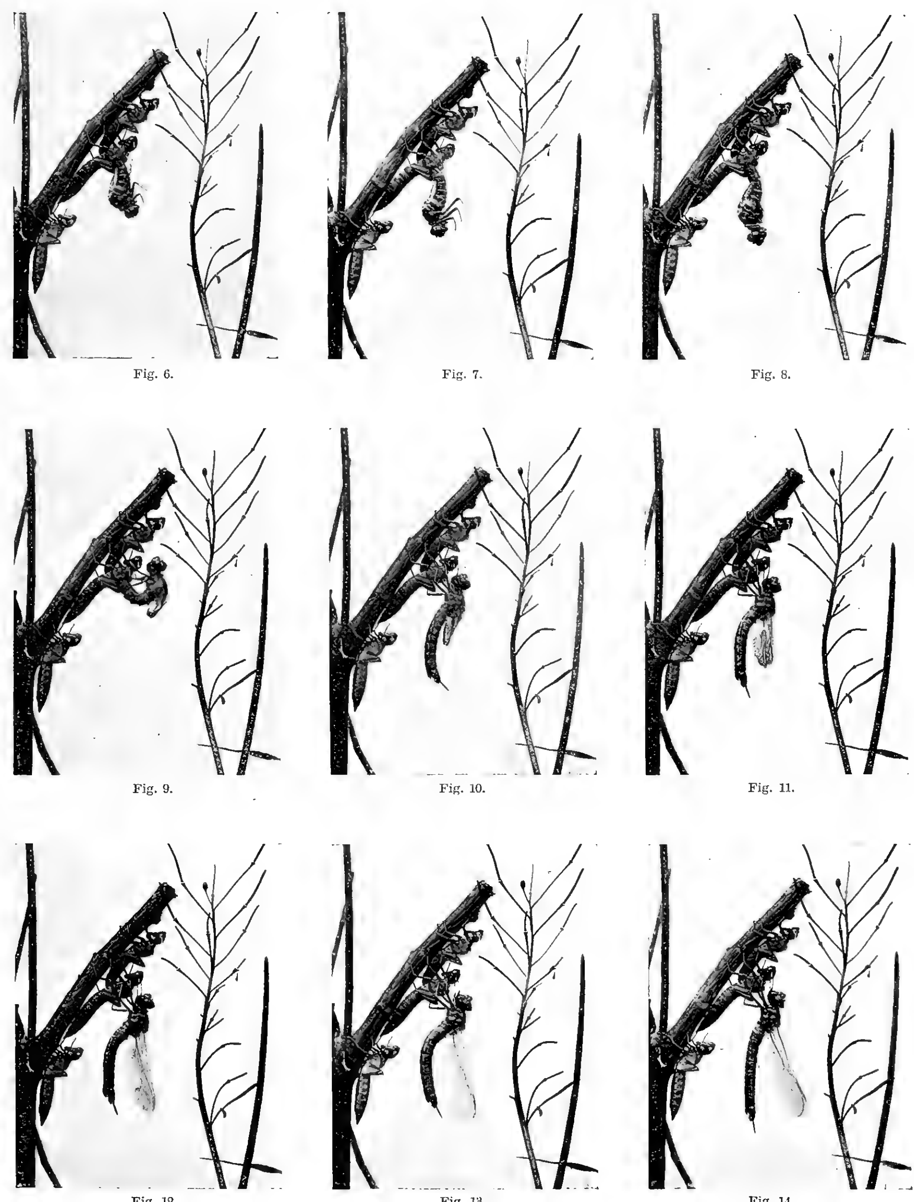


Fig. 6. Fig. 7. Fig. 8.

Fig. 9. Fig. 10. Fig. 11.

Fig. 12. Fig. 13. Fig. 14.

Now follows a marvellous sight: the head and thorax slowly bend back, and in so doing draw out from their sheaths the first pair of legs (Fig. 5), as well as stretching the delicate white breathing tubes from the main spiracles. At 10.46, the second pair of legs are free (Fig. 6), and three minutes later the third and last pair are drawn out (Fig. 7). The six legs are all quietly folded close up to the thorax and the dragon fly hangs head downwards, suspended by the tip of its body, which is gripped by the elasticity of the old skin of the nymph. In this extraordinary position it remains for the "resting stage," which varies from fifteen to forty minutes with different species (Fig. 8). Do not take your eyes from off it even for a single moment, lest you lose the most wonderful gymnastic feat, which is worth waiting to see.

In this instance the "resting place" occupied sixteen minutes; then in a moment, with a mighty muscular effort, the dragon fly turned its head and thorax up, caught hold of the old nymph with its claws, and for a brief part of a second formed the "loop" seen at Fig. 9, almost at the same time withdrawing its body out of the nymph and hanging free in the position seen at Fig. 10. Like many a "higher animal," it clings to its old garments, which are still serviceable for a short time. Soon the habits will be changed and "all things become new."

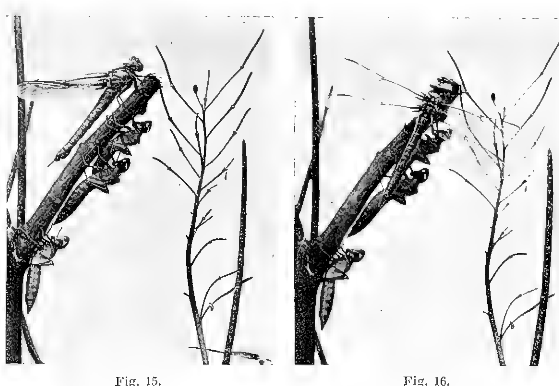


Fig. 15. Fig. 16.

After a preliminary sort of shake the wings begin to lengthen in a mysterious manner, as in Fig. 11. This was photographed at 11.4, followed by several others showing the gradual and almost imperceptible growth of these wonderful organs.

In a short article it is an impossibility to show the exquisite harmony, so to speak, and we must be content with the somewhat rapid development in Figs. 12 and 13, in which is shown the body gracefully bent that it does not come into contact with the wings, which nature orders shall take precedence. As soon as they are mature the body rapidly develops to its full length (Fig. 14), but not until the contained fluid has been discharged is the dragon fly able to use its wings, and not even then with safety to itself. It must rest for several hours before it mounts upon the highest point (Fig. 15), where it opens and shuts its perfect wings. From here (Fig. 16), at 1.10 p.m., our dragon fly sailed away upon its virgin flight over the tops of the highest trees, where it revelled in its new life, being more than a match for any bird that ventured its capture on the wing.

Fred Enock

Photographs by N. Lazarnick, New York.

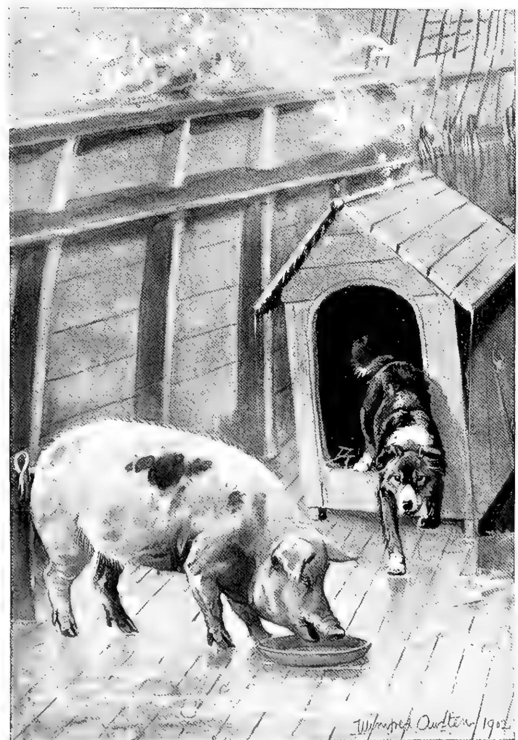
A STARVING PYTHON.

The Snake (27 feet long) shown in the above photographs was in the habit every six weeks of having a meal of guinea pigs and chickens, etc. On one occasion he refused to eat, so the authorities had to ram the food down his mouth to prevent him from starving. The two photographs depicted above graphically show how this was done.

ANIMAL ANECDOTES.

Strategy.

The following is told of a pig and a dog who were passengers on the same ship and were quite warm friends. They used to eat their potatoes off the same plate and but for one thing would never have had any trouble. This was that the dog had a kennel and the pig had none. Somehow the pig got it into his head that the kennel belonged to whichever could get into it first. So every night there was a race. If the dog won he would show his teeth and the pig had to lie on the softest plank he could find. If the pig got in first, Toby could not drive him out. One rainy afternoon the pig found it rather unpleasant slipping about on deck and made up his mind to retire early. But when he reached the kennel he found the dog snug and warm inside. "Umph!" he said, but Toby made no reply. Suddenly an idea flashed upon him, and trudging off to the place where their dinner plate was lying, he carried it to a part of the deck where the dog could see it, and began rattling the plate and munching as though he had a feast before him. This was too much for Toby. A good dinner and he not there! Ah, no, and out he ran. The pig kept on until Toby had come around in front of him and pushed his nose into the empty plate. Then like a shot he turned around and was safe in the kennel before Toby knew whether there was any dinner on the plate or not!



The pig began munching as though he had a feast before him. This was too much for Toby.

Too Conscientious.

An extraordinary story is told of an elephant employed in a timber yard. A number of logs had to be moved by him, and only one remained when the bell rang for ceasing work. Of course the elephant knew the bell and what it meant, and was sauntering away when the foreman bade him move the last log. He did not object, but with all his tugging and straining did not manage to lift it. Seeing this the foreman called up a second elephant to help, but even the two together did no good—the log could not be stirred. It must be left. Next day, to the foreman's astonishment, when the bell rang for beginning work, the first elephant marched straight up to the log, lifted it quite easily and carried it to its proper place.

An excellent idea.

An eyewitness vouches for the truth of the following story: A certain doctor kept a tame sea-gull which was allowed the freedom of the garden, in which was placed a tub of water. One morning a piece of fish was brought out for the bird's breakfast, but it did not for some moments attempt to eat it, and a passing cat seized the opportunity

of a good meal by snatching up the fish and making off with it. But the thief had reckoned without his host, as he soon found to his cost, for the gull seeing its food thus stolen flew at the cat and seizing him by the back of his neck carried him to the tub of water in which it performed its daily ablutions. It immersed the cat, who still clung to the fish, and then withdrew it from the water to find that he still held the fish. Again and again the sea-gull immersed its prisoner, until the cat yielded up its unlawful booty. Then letting the captive free the bird prepared to enjoy its repast and the thief departed a wetter but a wiser cat.

By a dexterous movement the horse wheeled round and flung out his heels, giving the dog the full benefit of the kick.

A Chivalrous Horse.

Two men, accompanied by a fierce mastiff, were going across a field when the dog broke away from them and began savagely to attack a donkey quietly feeding there. It seized the poor animal by the throat, dragged it off its feet, and then began to worry it in a manner which made the donkey's chance of life seem very small. To the shouts of the men the mastiff paid no heed. But there was another witness of the scene—a horse in a neighbouring field. He saw the whole affair and apparently made up his mind that the situation was desperate. Somebody must go to the aid of the donkey, and the horse went. With one spring he was over the hedge. Before the dog realised his danger the horse seized him with his teeth, tore him from his prey, and then by a dexterous movement wheeled round and flung out his heels, giving the dog the full benefit of the kick. The mastiff slunk off with his tail between his legs.

A Kindly Rat.

A Leicestershire clergyman, who has made a study of rats, relates a story which came under his own observation. He was walking one evening in some meadows, when he observed a large number of rats in the act of migrating from one place to another. Standing perfectly still, he watched them as they passed by quite close to him, and saw amongst the number an old blind rat with one end of a piece of stick in his mouth, while another rat held the other end, and thus conducted his blind companion in safety to their new abode.

A Monkey's Memory.

A French duchess saw an organ-grinder ill-treating his monkey. She was moved with pity and bought it. It became her chief pet and used to follow her about everywhere. Once she invited a party of guests to a concert. The monkey was allowed to watch, but instead of staying where she had put it, it took the hat of one of the guests and made a collection, much to the delight of the audience, and then emptied the contents into the player's lap.

ZOO NOTES.

Described and illustrated with photographs
By W. P. Dando, F.Z.S.

THE NEW APE HOUSE.

The New Ape House.

The photograph of the new ape house will give our readers a fair idea of this very substantial building, which has been provided for one of the chief attractions of the Society's Gardens, the anthropoid apes—perhaps the most attractive and interesting of all the groups of mammals which can be kept in captivity, and at the same time one of the most difficult for proper treatment. The portion of the building devoted to the animals has been divided into four roomy compartments, which it is believed will provide ample accommodation for a series of the principal anthropoid apes—the ourang, the gibbon, the chimpanzee, and, it is hoped, the gorilla. The main feature of the new building is the entire separation by a glass screen of the part appropriated to the spectators from that in which the animals are lodged, whereby it will be possible to keep the animals in a higher temperature than that allotted to the spectators, and also to prevent their infection by external influences. This plan has been lately adopted in several ape houses built in Holland and Germany, and will, the Council trust, be found to answer its purpose in the present instance, although it is to a certain extent a matter of experiment. The building cost £6,881 to erect. One of the present inhabitants is a proboscis monkey—the only one in Europe, and never before seen in England.

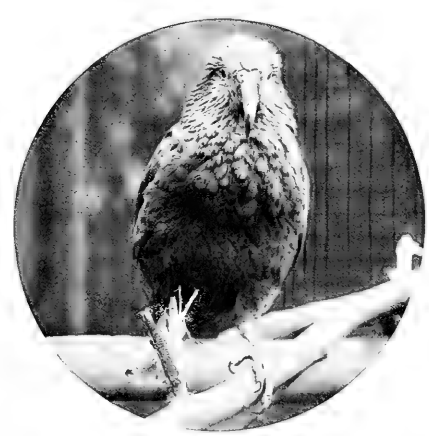
PROBOSCIS MONKEY (full face)

The Kaka Parrot of New Zealand.

A very fine pair of Nestor parrots has just been added to the collection at the Zoo, and it is a pleasure to see them in a spacious aviary behind the camel house, and not huddled up in a small cage in the parrot house. Semi-nocturnal in habits, the Kaka remains quiet and generally concealed in the inner enclosure when the light is good. They are very sprightly in habits and are fairly tame.

PROBOSCIS MONKEY (profile).

This particular variety of the New Zealand parrot (*Nestor notabilis*) is not as beautifully plumed as some of the varieties, but has a distinguishing characteristic which has made it most notorious. In 1872 one of these parrots (then called the Mountain Kea) was added to the Zoo collection, but only survived a few days; but the London press considered the advent of the bird sufficiently important to chronicle it, as follows, and the notice is sufficiently accurate to be applicable to the two fine specimens introduced this summer. "There is now at the Zoo a very remarkable bird, the *Nestor notabilis* or Mountain Kea of New Zealand. It is a parrot of strong frame and powerful bill and claws, which were used, like those of all parrots, for obtaining a vegetable diet, until the colonists introduced sheep and pigs. As soon as this was done the Kea seems to have abandoned vegetable food and to have taken entirely to flesh eating. He attacks sick or dying or disabled sheep, and with his powerful cutting beak opens a passage through the back, and eats the intestines. Even healthy animals are sometimes assailed by the *Nestor notabilis*, and there are sheep runs in New Zealand where considerable losses have been incurred through these strangely degenerate birds. The specimen at the Zoo gave as much trouble to capture as an eagle: it tore the clothes of the shepherd who knocked it down while pouncing on a lamb, and lacerated his hands. This parrot scorns cooked meat, biscuits, fruit, or seed, and likes raw mutton better than any cooked food. This is a very curious example of change of habit, for there is every reason to believe that before pigs and sheep were introduced into New Zealand the Kea was as frugivorous at his meals as most if not all other parrots. He will now eat pork and beef as well as mutton, and has become, in fact, utterly and hopelessly carnivorous." Recent observation has shown that it is the kidneys and the fat surrounding them that the Kaka attacks, and not the intestines, as stated above.


KAKA PARROT.

Not many years ago Japanese drawings of what appeared to be domestic fowls, with

tail feathers 12 to 15 feet long, were treated only as "flight of fancy" of the native artists. Even the very fine specimens exhibited in the central hall of the Natural History Museum, S.W., are not so convincing as seeing the birds alive, and by special permission I am able to show a photograph of one of the prize cocks, brought over by H. H. Prince Komatsu of Japan, as a present to H. M. the Queen. They were only deposited at the Zoo for a few days, awaiting instructions from Her Majesty as to their destination. These long-tailed fowls were originally found in a village in Japan called Shino-wara-tao, and were named after it. When naturalists were convinced that fowls with tail feathers 15 and even 17 feet long really existed, they objected to the long tails on the theory that, as fowls moult once a year, there would not be sufficient time to re-grow them, and were surprised to find that these birds only moult them once in every three years. The care and ingenuity shown by the "Japs" in making the cages in which these birds were brought over is worthy of all praise, and are so arranged that the tail feathers drop behind a shelf and cannot get damaged or soiled, and the cages are a fine example of Japanese wood and bamboo work. Had similar care been given to the "housing" of the bird of paradise which arrived lately (it was almost unrecognisable in comparison with the stuffed specimens at Cromwell Road), we should no doubt have had a fine specimen of this most beautiful bird to delight us. But many animals kindly sent to the Zoo have not sufficient care and thought bestowed upon their "packing." A photograph is also given on this page of a white Japanese bantam sent over at the same time as a present to Her Majesty.

Yokohama or Phœnix Fowls.

WHITE JAPANESE BANTAM.

YOKOHAMA LONG-TAILED FOWL.

Siberian Sledge Dog.

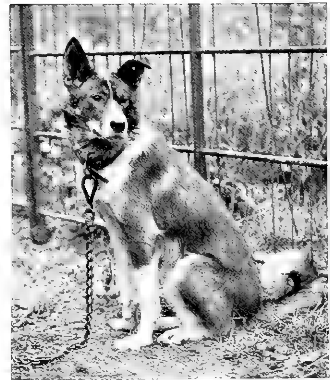
The interest shown in the Antarctic Expedition, which was taken out by Commander R. F. Scott in the "Discovery," must arouse a desire to know more of the methods used by Commander Scott and his gallant crew as a means of locomotion after the vessel becomes icebound. The photograph shown is that of the principal leader of a pack of Siberian sledge dogs, which were under the care of Mr. Weller, who had the charge of the dogs under Nansen and other explorers. The pack were temporarily deposited at the Zoo for about a week last July. They felt the heat so much that they had to be placed in open runs with tarpaulin coverings, which were kept as cool as possible with water. All the dogs were specially trained for the work, and cost about £30 each, and being used to intense cold, could not bear the journey in an ordinary steamer through the Red Sea, so were sent on in advance of the "Discovery," in a "mutton boat," and were kept in the refrigerators to acclimatise them to the intense cold they had to go through.

Indian Wolf.

The manner adopted by the Indian wolf in securing its prey is most sagacious and worthy of special mention, as I have it direct from Mr. W. A. Wallinger, of the Forest Service, Bombay. He related to me, during a tour round the Zoo, that the Indian wolves assemble in packs of about six, and, knowing the deer they attack are much fleeter than they are, they arrange quite a plan of campaign, and post themselves singly at different points of a part frequented by deer, and remain secretly hidden until the deer are well within their track. One of the wolves then springs out and drives the deer towards the first point, when the next wolf takes up the chase; this is again and again repeated until the deer is finally captured, the entire pack coming in at the death.

Baby Syrian Bears.

That bears are one of the most ancient animals of which we have any record is acknowledged, for Daniel is described as having fought with them, and Elisha having prophetically cursed some lads in Bethel for insulting him two she bears issued from a neighbouring forest and wounded forty-two of them. One of the two bears photographed shows every indication of being of a similar nature to its ancestor, for even at this young age the keeper has to be careful in handling it. The picture shows them being fed with a spoon containing condensed milk direct from the tin, and as this preparation somewhat resembles honey (which most bears are very fond of) they lick it down most ravenously. The pair are now denned by the side of the bear pit, and they are growing very fast.



SIBERIAN SLEDGE DOG.

INDIAN WOLF.

YOUNG SYRIAN BEARS.

Hairy-Eared Rhinoceros.

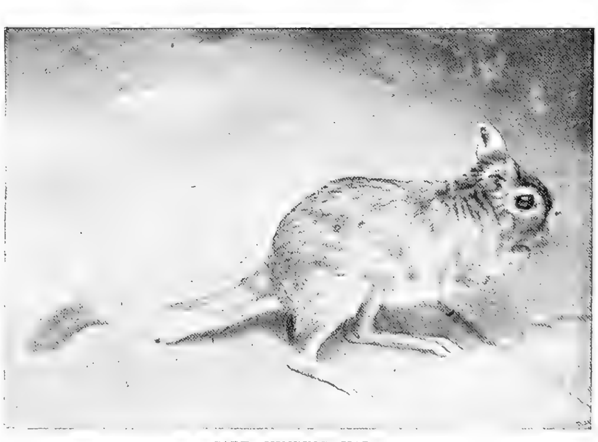
No animal at the Zoo is more amusing than this creature, which is much more nimble than old "Jim." If you happen to see him in the "run" after a week or so of rain and watch the way he grovels in the soft clay-mud and endeavours to bury himself in it, and then wait to see the comical appearance he presents after his *Schlamm-bad*, covered from head to foot with mud, you cannot help raising a smile. Being a very nervous animal, one only has to shuffle the feet as he is passing by the bars to start him off with a run, which is most grotesque. The photograph was taken during the rain, just as he was about to throw himself into his little bed, which he had been "rooting." Rats were very plentiful a few years ago

in the rhinoceros sheds, and one frequently saw them running over the armour-like hide of these big beasts, who either did not feel them (for they never made any attempt to drive them away) or thought them too insignificant to notice; but many a one has been found crushed as flat as a pancake in the straw under the place where the rhinoceros has been sleeping.

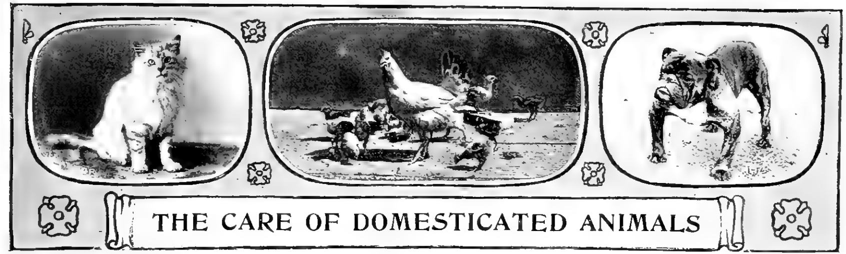
HAIRY-EARED RHINOCEROS.

Spring Hare.

THE Cape Jumping Hare has been on view at the Zoo since March, 1899, but the one shown in the photograph was brought to England by a regiment recently returned from the front. The following account of the animal is quoted from the "Referee": "It is rather a remarkable beast, with no near relations, another 'Animal Odd Volume,' like the kinkajou. It is a rodent, with the usual rodent teeth, like a hare's or a rat's, but it is built just like a kangaroo. Like a kangaroo, it travels by a series of extraordinary bounds, and is quite as hard to shoot as an ordinary hare. There are several kinds of the latter in South Africa, but only one jumping hare in the world. A full-grown one is about 20 in. long from the nose to the root of the tail, and the tail is longer still. When it is bounding along the tail is carried upright like a flag, not trailing behind it. It lives in colonies, in very deep, complex burrows, from which it can often be bolted by pouring water down. It has (says a writer in 'Country Life') the Boer dislike to this fluid applied externally. It is as destructive to crops as a rabbit. Clover, grass, and vegetables are bitten down short and devoured, both green and ripe. The flesh is, consequently, very good eating indeed. Jumping hares are only seen about in the evening, and prefer to be abroad at night; consequently, as they stay in the burrows by day, they are difficult to shoot. Colonial boys—boys, we mean, in the English sense, not Kaffir—have good sport in shooting them by the aid of the light thrown by a bicycle lamp at night. The lamp is carried in the left hand, and the light is reflected by the eyes of the jumping hare; the hares are as bold at night, when man is about, as most nocturnal beasts are, which know well that we cannot see them.



CAPE JUMPING HARE.

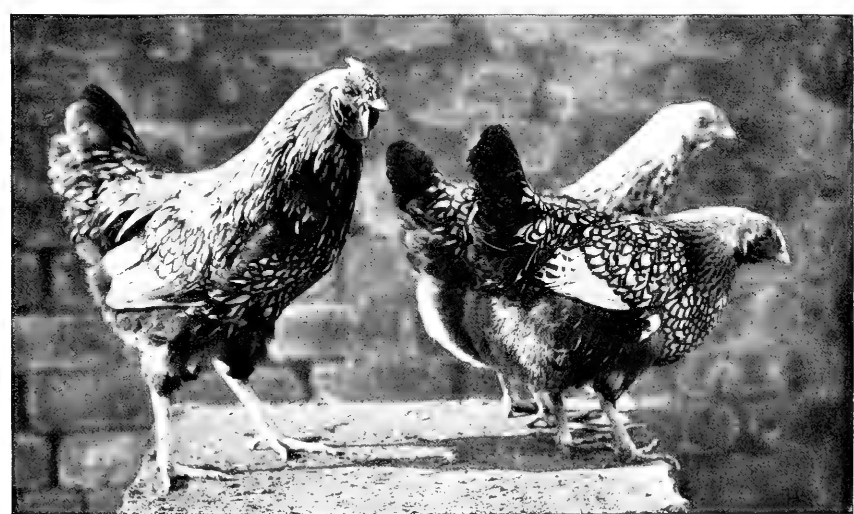


THE CARE OF DOMESTICATED ANIMALS

By W. M. Freeman.

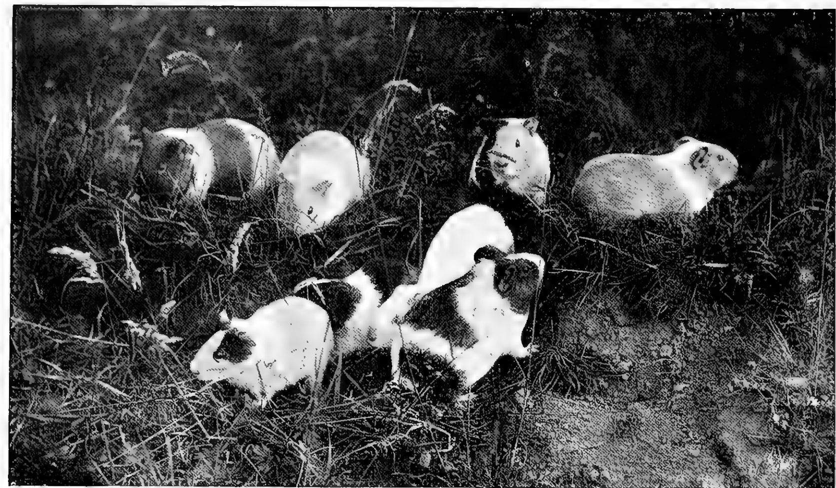
The Wyandotte Fowl.

This is a breed of poultry which can be recommended to anyone who is thinking of taking up poultry keeping, whether the accommodation be extensive as it is on a farm or restricted as in a garden. The Wyandotte is known as a modern variety, and was originally imported from the United States, where it is largely bred and held in high appreciation. It seems to have been derived from three sources—the Plymouth Rock, from which it gets its quality as a good winter layer of brown eggs, the Hamburgh, whose influence is seen in the plumage and in its prolificacy (for it is a great layer), and the Dorking, whence it derives its qualities as a table bird. It may therefore be described as a good, general, utility fowl; at the same time it is easy to rear under any conditions, matures quickly, is a quiet and well-behaved bird, not given to flying over fences, and on account of its active habits is usually a very healthy class of fowl to keep—provided, of course, it is not over-fed and made indolent, as is so often the case with poultry kept in confinement. There are several sub-varieties, the principal being the golden and the silver, either of which do well in confinement; the



Photograph by C. Reid, Wishaw, N.B.

WYANDOTTES.



Photograph by C. Reid, Wishaw, N.B.

GUINEA PIGS.

white and also the buff varieties are more suitable to be kept on a farm, because their plumage preserves its beauty better at liberty than in confinement. Besides these there are several other fancy varieties which, however, at the present are more of interest for exhibition purposes than for their useful qualities. Those who require a good, general, all-round fowl for profit as well as pleasure cannot do better than go in for the golden or the silver, which are the two oldest sub-varieties of the Wyandotte family.

The Carrier Pigeon.

A GREAT deal of confusion exists in the public mind as to what constitutes a Carrier pigeon, and very few people outside the ranks of fanciers understand clearly that a carrier pigeon is quite a different bird from a homing pigeon. The carrier pigeon is so called, not because it carries messages, but on account of its carriage or bearing. It has a large warty growth or excrescence round its beak which is often the size of a large walnut, and this effectively prevents it from finding its way from the front of its owner's house to the back. The homing pigeon is the bird which carries messages and is quite a different type of pigeon altogether, being a descendant of the old-fashioned blue rock and the antwerp. The carrier pigeon is bred solely for exhibition purposes, and has been termed by its devotees the king of pigeons. It may be regarded as the aristocratic variety just in the same way as the bull-dog has become the fancy of the aristocracy in the dog world. A fairly long purse and a liberal equipment of time and patience are necessary for the successful culture of the carrier pigeon; and it is worthy of note that one of the most successful exhibitors of carriers known to the present generation has been a lady (Miss Chalcraft), whose carriers for a good many years past have won prizes at the great National Show at the Crystal Palace, which is the premier exhibition of the year.

The Guinea-Pig Fancy.

THE Guinea Pig or Cavy, as it is termed by fanciers, has been coming prominently forward during the last few years in two different ways. It is proving itself the friend of man by the self-sacrifice which it is being called upon to make in the interests of medical science. Those whose business

it is to experiment with new serums for inoculating men and animals as a preventive of and cure for various terrible diseases find the guinea pig a very useful subject for experiment. But it is as a subject for the interest of fanciers and exhibitors that the guinea pig has come most prominently forward of late, and now a very large number of agricultural shows extend their classification not only to fancy rabbits but to cavies also, and there exists a National Cavy Club, watching over the general interests of those who have taken up this hobby, besides numerous small clubs throughout the country formed of those who breed rabbits and cavies. Some of the most successful of these animals are very valuable—as is only natural, considering the large number of cups and prizes open to be won by the most perfect specimens. I knew quite recently of a guinea pig changing hands for £25, and I believe that that is by no means an exceptional circumstance. Cavies are not at all difficult to manage, and on the whole are very hardy. The principal causes of disease amongst them are overfeeding with farinaceous foods and insufficient exercise —both of which causes operate to set up liver complaint. Ample exercise and plenty of green food are the two main essentials to success.

Cage birds Moulting.

Particular care needs to be taken of cage birds during the latter part of the summer, when they are changing their plumage. The annual moult necessarily involves a great strain upon the constitution of a bird and is often attended with disease in some form or other. As a rule birds which are at liberty get through their annual moult without any trouble; but those which are kept confined in small cages require particular care. If the weather be unusually cold, birds in moult are liable to take chills, and they do not seem to be able to develop their new feathers as rapidly as they do when the weather is hot. A bird which does not seem to be getting through the process satisfactorily is understood to be "hanging in moult," and needs special attention in the way of warmth and stimulating food like hemp-seed with the addition of a little chemical food to the drinking water. It is also very desirable to continue a good supply of green foods, which assist in keeping the birds healthy during this period and go a long way towards encouraging the rapid growth of the new feathers. I need hardly point out how necessary it is to give extra attention to foreign birds which have been imported from warm climates, as these are naturally more liable to suffer in our changeable climate here than in their own native haunts.

Photograph by C. Reid, Wishaw, N.B.

A TAME BLACKBIRD.

W. M. Freeman

[N.B.—Photographs intended for these columns should be addressed to "The Editor, Animal Life, 34, Paternoster Row, E.C."]

NOTES AND COMMENTS.

Mr. John J. Ward, of Coventry, has sent for publication a photograph of the Mayfly after its emergence from the *subimago* skin, which may be seen left behind on the grass blade. Mr. Ward writes:—

The final emergence of the Mayfly.

"After spending two or three years at the muddy bottom of the river, the mayfly nymph prepares for its brief and final winged state. When all things are perfected the nymph floats to the surface of the water, and almost before we are aware of what is taking place a mayfly appears and rising on its nymph skin flies to the nearest riverside plant.

"But this is not the perfect mayfly—only an intermediate or *subimago* stage, for the insect has yet to make another emergence before it completes its metamorphosis. But let us examine the mayfly at this stage in its life-cycle. First we observe that the insect is of a dingy hue or grey colour, not a spark of the brilliant and varnished-like surface of the wings and body of the perfect mayfly as it flashes in the evening sunlight. Secondly, its forelegs seem too short; and its caudal *setæ* or tail filaments seem blunt and shortened; even its wings are cramped and small.

"But we must wait awhile, our insect is resting from the great efforts of its recent emergence. After a time, which varies very much in individual insects, a little trembling sensation seems to take possession of the mayfly, and then a most beautiful and marvellous emergence and transformation may be witnessed.

"The skin at the back of the head splits, and slowly the head and forelegs of the perfect insect appear through the broken integument, and, remarkable to observe, the forelegs have nearly doubled their previous length. After the head and forelegs are through, the insect draws itself forward until its wings and the remainder of its body gradually leave their glove-like vesture. The one remarkable feature that strikes the observer is the apparent telescopic expansion of every part as soon as it leaves its *subimago* skin. The wings become glossy and sparkling as they leave the delicate integument, and in the latter almost immediately collapse as the wings are withdrawn. But most wonderful of all is the withdrawing of the tail filaments, seeming almost like the work of a magician, as these appendages, nearly three times the length of their cases, are withdrawn.

"The photograph shows the brilliant and fully-developed mayfly just emerged and prior to its flight, leaving its *subimago* skin on the grass blade behind.

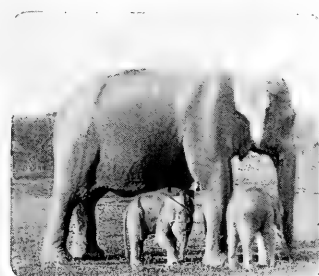
"The pseudo-imago condition constitutes the 'dun' of anglers, while 'spinner' refers to the perfect insect."

THE MAYFLY. (Natural size.)

From a photograph taken immediately after its emergence from the *subimago* skin.

Mr. Clement Shorter has kindly given us permission to reproduce the accompanying photograph of an Indian elephant and her twins. A young

Twin Elephants.


A PAIR OF TWINS.

elephant is not weaned for two or three years, so that it is not an unusual sight to see a cow suckling two young ones at a time, but two at a birth is by no means usual, though it could hardly be called rare. It is curious, considering elephants are comparatively speaking common animals, that so much mystery and uncertainty should exist concerning certain of their habits—those of wild ones, at all events.

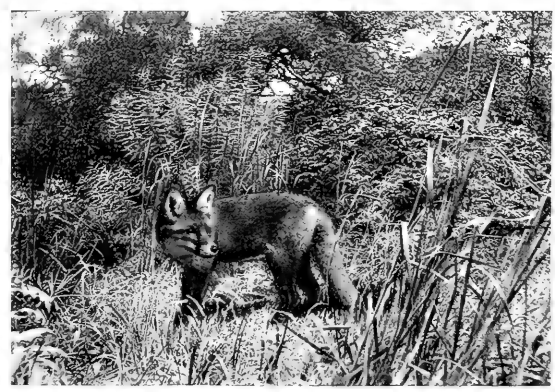
Foxes and their Families.

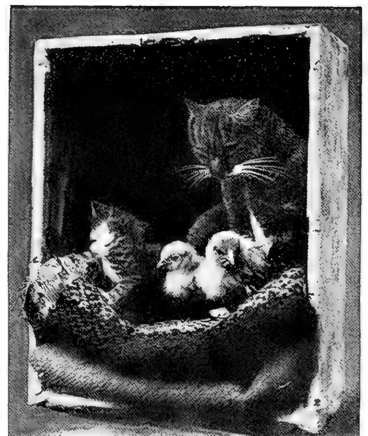
TOWARDS the middle and end of September cub-hunting begins. By this time the cubs are about five months old. Born in early April they stay in their nursery until June, and are well looked after by their mother, who, as soon as they are old enough, moves them to a wood or corn field. A vixen does not pillage near her home if she has cubs, but goes some distance away, in order to avoid unpleasant results should a search for the culprit take place in the neighbourhood of the robbery. The truth of the following story is vouched for by a keeper:—A vixen made her nest under a stack of wood on a farm; during the whole time she was there nothing was missed from the poultry. One day a trap was set for cats, and during the night a fox cub was caught in it. Directly the vixen discovered her loss and the cause of it, she took her remaining cubs to a field of corn some miles away, and the next night returned to the farm and killed five of the fowls, whether from motives of revenge or for some other reason, who shall say?

A Shark Story.

THE following story from Trieste is strongly suggestive of something more than instinct. We quote it without further comment from the telegram of a news agency, and leave our readers to draw their own deductions.

"While a party of children were fishing from a boat off Parengo two huge sharks approached the boat. One of the pair made a fierce attack on the rope by which the boat was anchored, and, seizing it in its mouth, pulled the boat to and fro, evidently trying to upset it, while the other swam round and round the boat and its terrified occupants. One boy, more brave than the rest, had the presence of mind to cut the rope and, seizing the oars, rowed for dear life to the shore, the sharks following until the water became too shallow for them, when they turned back and swam to and fro some distance off. An alarm was raised by the children as soon as they reached the land, and boats with men carrying improvised harpoons, spears and hatchets put off in pursuit of the sharks. The creatures waited on the surface until the boats were close upon them, when they sank."


Photograph by F. T. Smith.
ON THE LOOK OUT.



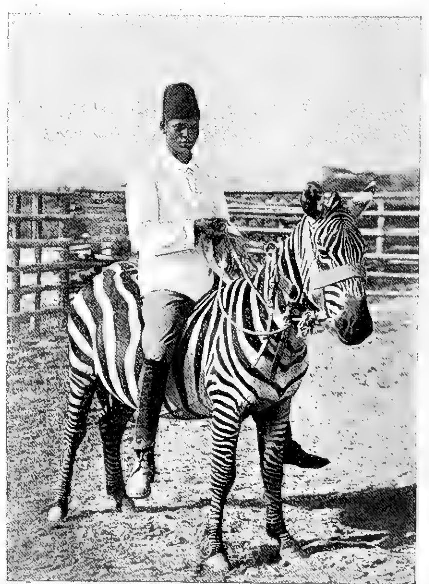
A CAT THAT REARED SOME CHICKENS.

A strange Foster-Mother

An incident which has been the talk of the country-side recently in North-East Lancashire is illustrated by the accompanying photograph. At Holden Green Farm, Bolton-by-Bowland, two eggs out of a sitting were later than the others in hatching out, and when the chicks came into the world, the poor things had no mother. The kindly farmer's wife allowed a favourite cat a place on the cosy kitchen hearth, in a box that stood on end, lined with a cushion, and she conceived the idea of placing the two chicks in this, to see if the cat would "mother" them. Strange to say the cat took to the chicks from the start, allowed them to nestle under her, purred over them, and the three made a happy family. Then the cat presented kittens for company, and one of them was allowed to remain. The chicks grew up and were ready to go out into the world themselves, at which point the unique family of cat, kitten, and two chickens were photographed as here seen. We are indebted to Mr. W. H. Knowles, of Blackburn, for the above information and for the accompanying photograph.

A Zebra and some Buffaloes.

The photograph of the Zebra with a native on his back has been sent to us by Mr. Carl Hagenbeck, of Hamburg. The animal is a new mountain zebra from German East Africa. The photograph was taken within three months of its capture, and the fact that it is being ridden is interesting as once more disproving the statement that these animals are untamable. Indeed, a visit to the celebrated Thier Park at Hamburg would almost convince anyone that there is scarcely an animal which is not capable of being tamed, at all events at this establishment. It is no exaggeration to say that in no place in the world can such a varied and ever-changing collection of birds, beasts and reptiles be seen as at Hagenbeck's, nor would it be far wrong to say that nearly every rare animal exhibited in Europe has been imported by this firm, which has agents all over the world. To Mr. Hagenbeck we are also indebted for the photograph of the Caucasian and Siamese Water Buffaloes. The former are the two larger animals, and are one and a half and three years old, the latter are the smaller beasts in the middle of the picture, and are one and a half and two and a half years old.



A MOUNTAIN ZEBRA FROM GERMAN EAST AFRICA.
Three months after its capture.

Photography under difficulties.

Mr. Herbert Lazenby, of York, who took the accompanying photograph of a pair of Japanese Sika Deer in the zoological collection of the Rev. B. Hemsworth, at Monk Fryston Hall, Yorkshire, writes:—"I was warned before entering the enclosure that the buck had a very nasty temper, and so events turned out. I had a rough interview with him.

JAPANESE SIKA DEER.

"The keeper who entered the enclosure with me had occasion to leave me for a few minutes, and I immediately observed the buck making for my direction in a very threatening attitude, which soon ended with a furious charge on his part. I received the charge with my tripod bayonet fashion, but the springs giving way I was left unarmed. In the scuffle the strap of my camera case gave way, and the case falling to the ground scattered my dark slides. The buck gave me no time to consider this turn of events, and not caring to leave my camera and plates at his mercy, I adopted the rather risky method of seizing his horns. This seemed to make him more furious than ever, and I was forced down the field with a rush. I began to fear that he was likely to cause me some serious injury, but thanks to a pair of strong wrists I found that I was gradually gaining the mastery over him. The keeper's return at this point set me at liberty with no further injury than the loss of several patches of skin from my hands caused by the roughness of the buck's horns.

CAUCASIAN AND SIAMESE WATER BUFFALOES.

From a Photograph by J. Turner-Turner, reproduced in "The Giant Fish of Florida" (Pearson).

BONY FISH AND TOAD FISH.

The toad fish at the bottom is all but invisible, clinging as it does to the shell against a deceptive background of weeds.

An anecdotal account of some queer inhabitants of the seas—fish that walk, fish that talk, fish that fly, fish that climb, fish that bury themselves, and fish that are drowned if they stay in the water too long.

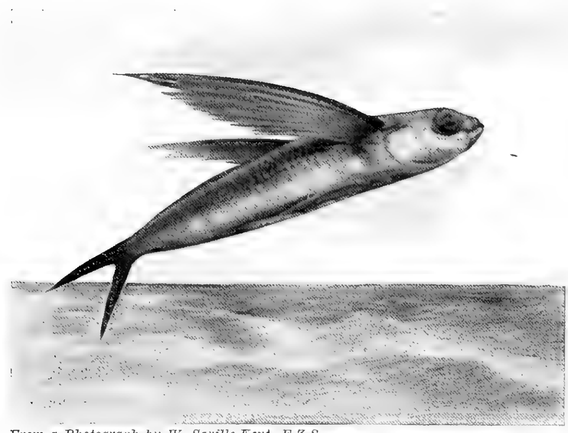
By W. Saville-Kent, F.L.S., F.Z.S.

PART II.

EXOTIC fish, as might be anticipated, yield an innumerable assemblage of forms that are remarkable for their *outré* shapes or peculiar habits. Among the latter the subject of the accompanying coloured illustration is deservedly noteworthy. In size and shape the species bears a by no means inconsiderable resemblance to the little Smooth Blenny or Shanny of British seas, whose exploits as a chivalrous defender of his hearth and home were chronicled in a previous chapter. In zoological parlance the fish is known as the *Periopthalmus*—a title bearing reference to its peculiarly modified eyes which can be raised or depressed at will, and under the former conditions command an uninterrupted all-round vision. In virtue of its mud-frequenting and skipping propensities the fish is more familiarly known as the Mud-hopper or Mud-skipper. It is an essentially tropical species, being particularly abundant among the muddy mangrove flats of North Australia and the Malay region. Under these conditions it may be commonly seen at low water associating in little groups and basking in the sun on the surface of the mud, chasing each other in sport with their quaint skipping action or, having climbed to the elevation of a mangrove root or the woodwork of the jetty, peacefully contemplating its companions' antics. The capture of the little fish seems at first sight an easy task, but woe betide the reckless enthusiast who ventures on the treacherous ooze in its vain pursuit. He will emerge from the enterprise with bemired raiment and

From a Photograph by W. Saville-Kent, F.Z.S.

MANGROVE "FIGHTING" OR "CALLING" CRABS.
The companions of the jumping fish Periopthalmus.
(See Coloured Plate.)



From a Photograph by W. Saville-Kent, F.Z.S.
FLYING FISH.

a much-chastened spirit. Should, however, the acquisition of specimens be an important object, the enlisted services of the wily native—who needs but a little paint and a pearl-shell for the renewal of his full-dress apparel—will speedily secure an abundant supply.

A remarkable circumstance associated with the life economy of *Periopthalmus* is the fact that it cannot sustain life if continually water-submerged like ordinary fish. The exposure of its tissues to the action of atmospheric air with every fall of the tide appears to be essential to its well-being, and examples experimentally kept under water for prolonged intervals were literally drowned. As a provision for its abnormal life-habits it has been ascertained that *Periopthalmus* possesses a supplementary respiratory organ which, singularly to relate, is represented in this instance by the creature's tail. The fish while reposing on the surface of the mud commonly leaves its tail more or less immersed in the water. The blood circulates with abnormal energy through this thin membraneous appendage which accordingly fulfils the function of a supplementary gill.

Some queer comrades commonly share the recesses of the mangrove thickets with *Periopthalmus*. These are the so-called Mangrove Fighting or Calling Crabs. The North-Western Australian species is notable for its brilliant livery of black and scarlet, while tints of orange, pink, or blue may be variously blended in allied forms. The huge relative size of one of the large claws or chelæ in the male individual is the distinguishing feature of these peculiar crabs, and being held aloft in a menacing or beckoning manner as the creature walks, has obtained for it in conjunction with its eminently pugnacious habits its characteristic popular titles.

Fish and crabs are found consorting with one another in tropical Australian waters under yet more singular conditions. The camping-ground of both the fish and crab is, in one instance, in place of a mangrove swamp, on the expanded disk or among the crowded tentacles of a Giant Sea Anemone.

From a Photograph by W. Saville-Kent, F.Z.S.
AMPHIPRIONS.
Commensal guests of a Giant Anemone that sleep and shelter among the Anemones' tentacles, but sport and feed among the adjacent coral thickets.

The anemone, in its fully extended state, may measure as much as from a foot to eighteen inches or more in diameter, and is variously tinted. The colours of the fish, however, are still more brilliant and in striking contrast to those of its adopted host. While the anemone is more commonly grey or brown, or it may be apple-green, the dominant colour of the fish is a bright orange-scarlet or vermilion, variegated with broad bands of the purest white. There are several varieties or species of this anemone-consorting fish, which are referred technically to the genus *Amphiprion*. Each of these species, moreover, is found to consort with an allied but distinct variety of sea anemone. In some of the species, as many as three white bands intersect the orange-scarlet ground-tint of the fish's body; in another variety there may be but two such bands, while in a third form only one band obtains. In the last-named instance this single white band crosses the head and cheeks of the fish in such a manner as to impart to it the grotesque aspect of having its face bandaged for the toothache. So apparently incongruous and apart from the uniform colouring of the general surface of the fish's body is this cross band, that on making the first acquaintance of an example of the species, bringing it up in a dredge with other specimens at Port Darwin, the impression was forced upon the writer that a fragment of white paper had accidentally got mixed up with the dredge's contents and was adhering to the fish's head. It was only on attempting to remove the supposed adherent matter that the illusion was dispelled.

From a Photograph by W. Saville-Kent, F.Z.S.

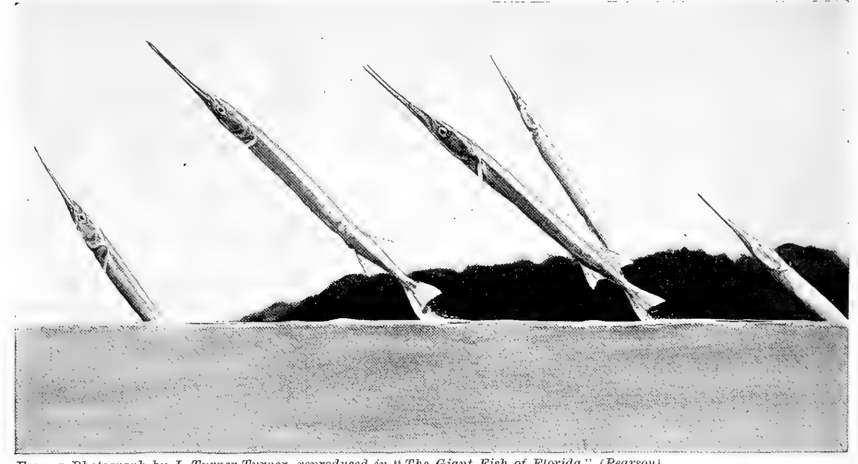
FIERASFER.

An Eel-like fish that lives as a parasite within jelly-fishes, bêche-de-mer and pearl oysters. In this example the shell-fish being annoyed by the intruder has entombed it within a winding sheet of its own pearly substance.

While the *Amphiprions* are habitually associated with the anemones, their relationship with the zoophytes are essentially those of lodging and not of boarding guests. In the coral pools that they frequent the fish may be found cruising round in sport or in search of food at some little distance from their host, to whose sheltering protection they hastily return on the advent of any disturbing influence. The possession of abnormally brilliant contrasting colours by fish and other animals has been interpreted by the light of modern biological knowledge to be commonly indicative of their unedible or it may be more directly baneful properties, and in such manner they are protected, being assured immunity from the attacks of many would-be devourers. Whether the little fish under discussion are poisonous or otherwise as food has not been determined, but in the former instance it might be supposed that the fishes' colours alone would suffice as a warning to over rash aggressors, and that there would be no need of the additional protection yielded by the sea anemone. As a simply protective provision, however, the bright hues of *Amphiprion* are probably amply efficient. It can be readily understood that a larger fish or other marine creature that in hot pursuit of its prey suddenly finds itself as it were precipitated into a bed of stinging nettles will in the future give the gaudy little *Amphiprions* a wide berth. The marvel is that the anemone refrains from exerting its stinging powers upon and from killing and devouring its little pensioner. Seemingly the relationship betwixt the two is much the same as that between the shark and the pilot

fish, the pilot acting not only as a scout to scent out provender, but also as a lure to attract larger game within striking distance of its adopted protector. The *rôle* of utility played by the small crab, as also certain species of prawns that are commonly met with as fellow commensal guests of the big anemone, is not so obvious. It is probably that of scavengers.

In another little group of fishes, a more essentially parasitic mode of life prevails. These are the Fierasfers, of somewhat eel-like shape and semi-transparent consistence, which are noteworthy for taking up their abode within the body or mantle cavities of the jelly-fish, sea-cucumber or bêche-de-mer, and large bivalve molluscs. The large mother-



From a Photograph by J. Turner-Turner, reproduced in "The Giant Fish of Florida" (Pearson).

GAR OR NEEDLE FISH.

They leap astonishing distances in the air, especially when pursued by a King Fish.

of-pearl and pearl-producing oyster of the tropical seas is not unfrequently tenanted by one of these parasitic fish, and it sometimes happens that either proving itself a "thorn in the flesh" to its molluscan host, or dying a natural death within its adopted domicile, the shell-fish, unable to eject the offending body, hermetically enshrouds it in a sheet of its own pearly substance. One such example that is preserved in the collections of the Natural History Museum is represented in the accompanying photograph.

W. Saville-Kent

Mr. Saville-Kent has promised to write a third article on this subject, which we hope to publish in some future number.

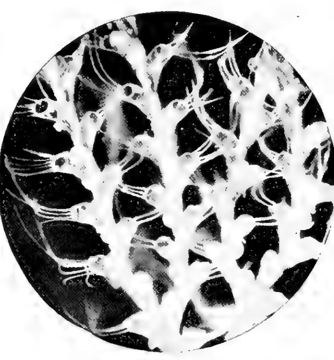
These graceful objects are not seaweeds, but the homes of several hundred beautiful animals.

THE STORY OF SOME STRANGE ANIMAL COLONIES.

By F. Martin Duncan, F.R.H.S.

If it were possible to obtain a census of all the pretty flotsam and jetsam gathered during the annual holiday, as mementos of pleasant rambles by the dancing, sunlit waves, the graceful seaweed-like objects portrayed here would be found to be in the majority. Cast ashore by the ebbing tide, their graceful feathery fronds all glittering with prismatic colours, they may well rank amongst the most beautiful waifs of the sea and be treasured as mementos of the happy summer days spent by the restless waves; while if the romantic and wonderful story of their life history were more generally known, they would be still more valued and keenly sought by the holiday-maker.

For a long while the feathery, seaweed-like things were a sore puzzle to all scientific men, and the cause of many fierce and wordy battles; so that for a while the world of science was split up into two parties, each perfectly certain that their own particular theory was right. And all this wordy warfare arose from the uncertainty as to whether these common objects of the seashore belonged to the animal or vegetable kingdom.



THE DESERTED VILLAGE.

This beautiful object was once the home of a colony of Moss Animals.

At first those who considered these graceful objects to belong to the vegetable kingdom were in the majority, and certainly this was not to be wondered at, for as generally seen when stranded on the shore they are singularly plant-like in appearance. And as plants these seaweed-like things would have been classed to this day, had not those opposed to that theory got out their microscopes and, instead of looking at the dead specimens cast up by the receding tide, gathered fresh and living forms from out the deep, rock-bound pools and, placing them in little glass jars full of fresh sea water, patiently watched their motions.

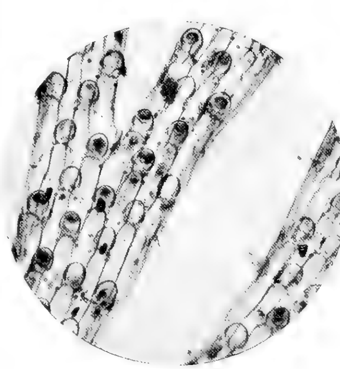
Richly were those patient watchers rewarded,

and wonderful the sights they saw, for on every branch and from every cell of the seaweed-like objects, small, beautifully coloured heads surrounded by gracefully waving arms were pushed forth. The tiny arms were seen to catch minute living things that swam about in the water, and to convey them to an equally minute but hungry mouth which eagerly swallowed them. Having proved their theory that the seaweed-like objects were not seaweeds at all but active animal colonies, these grave professors divided them up into two classes: those colonies which were composed of individuals without very complicated internal organs, their external anatomy, roughly speaking, consisting of the graceful tentacles and hungry mouth, and their internal anatomy chiefly of a capacious stomach, were called Hydrozoa; while the colonies consisting of individuals with a more elaborate digestive apparatus were christened Bryozoa or Moss Animals, from the moss-like appearance of their surface to the naked eye when all the little heads are seen protruding from their cells.

The hydrozoa have since proved to be most interesting creatures, undergoing all sorts of quaint and remarkable changes; indeed the whole life history of these remarkable little animals is most wonderful and romantic, for now we know that many of them by no means spend the whole of their lives as respectable and industrious members of the colony, all working for the common good, but in their youthful days go gadding about in such guise that their own relations would hardly recognise them.

DINNER TIME.

Part of a living colony of Moss Animals on the look out for a meal.



A SIESTA.

The Moss Animals take a rest while the "Bird's-heads" mount guard.

In the spring time of the year many of the cup-like cells, or Gonophores, on the stems of a colony of hydrozoa are closed at the top, and begin to grow larger until they become quite prominent objects and are seen to contain bunches of tiny round or oval bodies. Then the lids of the cups open and out come little surprise babies that have been formed within. Certainly their appearance must be as astonishing to the rest of the colony as the behaviour of young ducklings on catching sight of a pond is to a too confiding mother hen, for these veritable surprise babies have not the remotest resemblance to the individual hydroid; in fact, unless you actually saw them come out from the doors of the colony, you would never credit them with their real parentage, for instead of coming into the world as little polypes, with hungry mouths and graceful waving tentacles, they make their first appearance as miniature Jelly-fish.

After these young jelly-fish, or Medusæ, as scientific men call them, have enjoyed themselves for a time, swimming about and seeing the world, the more sober-minded amongst them renounce their roving ways and choosing a likely spot settle down in life as staid and respectable founders of a new colony, which in time becomes identical

Jackson's Hartebeest.

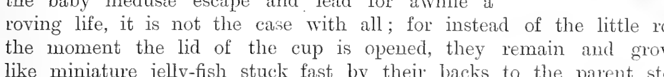
From an original painting by Sir Harry Johnston, G.C.M.G.

in all respects to that from which they sprang. Others, however, never sow their wild oats, but always remain restless roving creatures, yet these gad-about jellies have no mind to be outdone in the colony-forming way by their more peaceful and stay-at-home brethren, so they produce eggs, which in time turn first to other little jellies called Planulas, and then to hydroids, resembling the parents of the jelly-fish.

A colony of some eighteen thousand Moss Animals.

But these eggs are not the only offspring of the gay and restless little medusa, for by a process of buds which form around its mouth, underneath and around its disc, this remarkable little creature produces a series of other little jelly-fish, like unto itself in both form and habit.

Though with the majority of the hydrozoa the baby medusæ escape and lead for awhile a roving life, it is not the case with all; for instead of the little round bodies escaping the moment the lid of the cup is opened, they remain and grow at home, looking like miniature jelly-fish stuck fast by their backs to the parent stem.

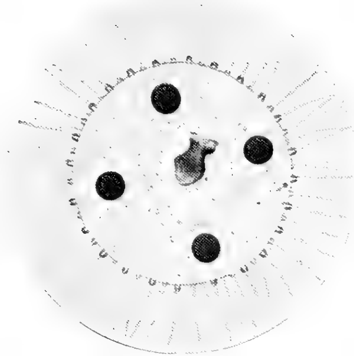


All through the long summer months the jelly-fish have a real good time, swimming lazily about and feasting to their hearts' content upon the countless swarms of animal life that dwell in the sea. As the autumn approaches with its tempestuous seas, in which the fragile jelly-fish soon perish, tiny hydras begin to appear upon the rocks at about low-water mark, and these baby hydras have come from the little oval or roundish eggs which the jelly-fish carried in those four white, or ruddy, round spots which all jelly-fish have on the top of their bodies.

Totally unlike their parent in appearance, these little hydras first settled on the rocks as tiny, oval or oblong planulas, clothed with long hairs which they had used to propel them to their resting-place. Once comfortably settled, the little creatures underwent considerable changes in shape; their outer skin formed into a kind of basin-shaped cavity on the top of the body and by-and-bye became the stomach of the animal.

Then around the edge of this hollow cavity little slender arms or tentacles grew out like so many rays, making the creatures look like tiny sea anemones in outward appearance, though there the resemblance ended, for these little creatures are all mouth and stomach. Throughout the winter these tiny hydras live secure from the violence of the heavy seas which so quickly batter their parent jelly-fish to pieces. As the spring approaches the hydras are seen to have grown in length and to have developed many waist-like constrictions in their tube-shaped bodies. In a little while the portions between the constrictions become marked with eight lobes, making the creature's body look like a pile of saucers placed one over the other. At last, round the lowest saucer-like piece which attaches the hydra to the rock, some tentacles appear, and then all the saucers above break off, separate, and turning upside down, are seen to have become tiny jelly-fish, and these minute jellies in the course of time grow into the large

A portion of a living colony of Hydrozoa.



The surprise baby of a Hydroid colony, shortly after its escape from the nursery.

and handsome medusæ, which are such conspicuous and familiar objects of the summer sea.

Almost as remarkable and interesting have the moss animals or bryozoa proved to be, with their ancient lineage going back into dim geological ages, and their wonderful habit of living together in great colonies which increase by a singularly plant-like budding process. They are the most sociable creatures, the little cell that forms the home of each individual member of a colony being generally connected on all sides to similar cells, so that the inhabitants can stand at their front doors and talk together with ease, which is fortunate for them as they are unable to quit their respective houses.

What a surprise the man who first examined a living colony of the sea-mat bryozoa under the microscope must have had. First he saw nothing but the familiar slightly oblong cells, which remind one of a number of round-toed shoes placed as close together as they will go in the neatest order imaginable. Then gradually from out each cell a circle of tiny arms or tentacles began to protrude, and when fully extended to bend about in all directions, transforming what only a few minutes before was an apparently inanimate object, into a dense crowd of active waving tentacles.

As there are on an average 1,800 cells to the square inch, each tenanted by a tentacle-crowned animal, some faint idea may be gathered of what a mass of waving arms are to be seen when a colony is in full swing of work. The average sized bunch of fronds which comprise an entire colony of the sea-mat bryozoa, has been estimated when in full vigour to have a population of 18,000 individuals.

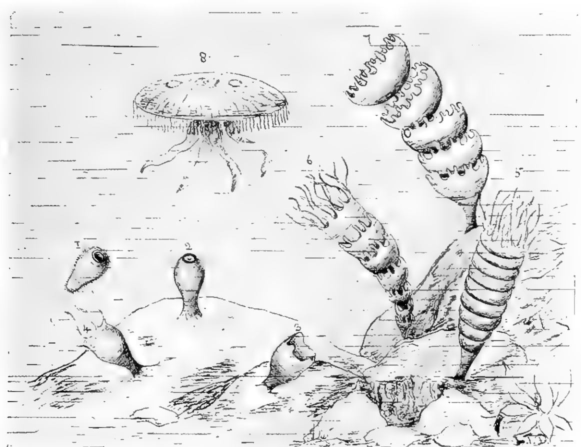
Each tiny member of this colony works for the common good, for they have a nervous connection with each other and probably a kind of general circulation throughout the whole colony. What represents the head of each animal, is crowned with a circlet of tentacles clothed with very minute but strong hairs or cilia. The hungry, eager little mouth is in the midst of the tentacles at the bottom of the circlet and leads to a tiny gullet and stomach. When the creature is hungry it protrudes its head from out the little opening at the top of the shoe-like cell, the graceful tentacles are expanded and, together with the hairs which clothe them, begin to wave about with a regular motion, causing a miniature whirlpool current to arise. In this whirlpool the various small animal and vegetable organisms on which the creature feeds become entangled and carried down by the current into its hungry mouth.

Though the sea-mat bryozoa is curious and interesting enough to watch through a microscope, it is nothing to the astonishing and truly marvellous sight which is revealed by that instrument when a living colony of the "Bird's-head" bryozoa is placed in the field. Not only the now familiar tentacles are to be seen waving in all directions, but from the outer side of each cell rises a

The nursery in which the baby Hydroids are formed. Note the circular door through which they escape.

sinuous neck crowned with what looks like a bird's head, the beak of which, as the neck sways to and fro, constantly opens and shuts with an angry snap. It is a scene of marvellous activity and action, for while the tentacles wave about wafting food into the mouth of the animal, the strange-looking bird's-heads are swaying about in all directions, making angry snaps at everything that comes in their way and hanging on with bull-dog tenacity, even clutching each other should they happen to come in contact.

For a long time these bird's-heads, which are peculiar to this species of bryozoa, were a sore puzzle. At first it was thought that they devoured the creatures that they caught and so helped to maintain the life of the colony; but more careful observation showed that this was not the case, for the bird's-head shaped things were found to have no stomach or digestive apparatus. The part they really play, is to act as scavengers and policemen to the community, keeping the body of the colony clean, and frightening off all unwelcome intruders. With their beaks, these bird's-heads pick off all foreign substance that may fall on or come in contact with the body of the colony, while the angry waving of their heads, and gnashing of their beaks, is enough to strike terror to the hearts of the majority of inquisitive or dangerous creatures that may venture too near.



THE TRANSFORMATION OF THE JELLY-FISH.

1. Free-swimming offspring of Jelly-fish.
2 and 3. It becomes fixed to the rock and settles down for the winter.
4. Develops tentacles with which to catch its prey.
5. With the advent of spring waist-like constrictions appear, which foreshadow—
6 and 7. The formation of a pile of individuals; and these—
8. As they are liberated one by one become Jelly-fish.

Other species of bryozoa have the bird's-head process replaced by hollow, whip-like thongs, called "lashers," which are in constant motion, thrashing the water in all directions over and round the animal, so as to keep off any large creatures that may approach and only allow small things to enter within the dangerous whirlpool current that leads to death and digestion.

Like the hydrozoa, the founder of each colony of bryozoa has a free-swimming period of existence. During the spring of the year, many of the little cells of the colony give protection to minute, orange-coloured eggs, from which escape in due time tiny free-swimming creatures, who after enjoying for awhile their free life settle down upon some comfortable and suitable resting-place and become the founders of new colonies. From a single individual, the colony rapidly grows, and increases both in size and the number of its members, by a most remarkable budding process which takes place all round what may be termed the growing edge of the colony.

F. Martin Duncan

Photograph by T. A. Metcalfe, Pickering.
THE COMMON SHREW.

MICE, VOLES, AND RATS,

BY

OXLEY GRABHAM,

M.A., M.B.O.U.

OUR British Mice, including the Shrews and the Voles, are nine in number. Some of them are little known, and of the habits of all of them we have yet much to learn. Of the shrews we have three different species—the Common, the Lesser, and the Water Shrew. The common shrew is to be found everywhere; it is locally known as the Blind Mouse—though it has distinct eyes—and in some districts as the Artystraw. I have often found their nests, containing from five to eight young; one that I came across when shooting in a second crop of clover was as late as the 1st of October, and contained five young about half-grown. There is a great mortality amongst shrews at certain times of the year, and they may be found lying dead on roads, pathways, and similar places. They are very pugnacious little animals, and, although generally insectivorous, will take carrion readily, and I have often trapped all three species, using this as a bait. They vary a good deal in their general colour. I have one beautiful pure white variety with pink eyes, which was picked up dead some years ago in Yorkshire. There used to be all sorts of superstitions about shrews; but these are fast dying out, though remnants of them still remain. Shrews have a peculiar musky smell, and though cats will catch them readily, they seldom eat them, though owls, kestrels, weasels, and stoats will do so readily. The lesser shrew—our smallest British mammal—is very much rarer than the common one, though in some districts it is fairly abundant. It has a proportionately much longer and more hairy tail than the common shrew has, and is darker in colour; the arrangement of the teeth is also different. I have trapped them, as I have done the water shrew, using a bit of rabbit's liver as bait. The water shrew is a very handsome little animal, looking to the casual observer like a miniature mole. It is common in many places, frequenting the sides of ditches, ponds, and streams,

Photograph by T. A. Metcalfe, Pickering.
DORMICE.

and when diving, surrounded by a track of air bubbles, it looks very pretty. I have several times picked them up dead far from water, so that they evidently travel long distances at times. The hind feet and under surface of the tail are beautifully fringed with stiff hairs to assist them in their passage through the water. I have known the nest situated in the bottom of an old wall, not far from a ditch, containing young a quarter grown at the end of June. The ordinary colour is a very deep brownish black above and silvery white beneath, but there is a melanic variety, of which I have obtained several, that is almost black all over, both above and below.

Photograph by T. A. Metcalfe, Pickering.

HARVEST MOUSE.

The Dormouse is far more common in the southern counties than in the north, and its nests may often be found amongst the brambles and the tangled undergrowth in plantations. In the autumn the dormouse lays up a quantity of fat, and having provided a store of food in case of need, it retires to rest for the winter. It is wonderfully agile and quick when climbing up in the hedges or undergrowth. I have known young in the nest in Yorkshire as late as the 19th of September.

The beautiful little Harvest Mouse is very local, but occurs in considerable quantities in some places, especially in the south-eastern counties. I have frequently kept it alive, and I had one for over two years in confinement. They are very amusing, and have a great partiality for blue-bottle flies. I have never known them to breed in confinement. They are very pugnacious. I once had six in a cage, and on going to look at them one morning I found all dead but one, and he succumbed to his injuries later on. Moreover the brains of nearly all the dead ones had been partly devoured. The nests that I have seen have been formed on the cornstalks, a foot or so above the ground, and made by splitting the stalks by means of their teeth and weaving them into a nest, but I believe at times they will build in thistles and large umbelliferous plants.

The Long-tailed Field Mouse, pretty as it is with its long tail and ears and big prominent eyes, is a most destructive little creature. It works havoc amongst the crocus and other bulbs, eats the crowns out of lilies and similar plants, roots up the peas when first sown, and is also very destructive to blackberries and other things. The late Canon Atkinson, author of that interesting book, "Forty years in a Moorland Parish," told me that they used to come in swarms into his church at Danby, in Yorkshire, and eat parts of the organ pipes. He set to work to trap them, and in one week captured over ninety. This mouse is often called the Wood Mouse, but it is quite as plentiful, if not more so, on arable land. In winter I have found it curled up in an old hedge sparrow's nest. It is very prolific, and can be tamed without much trouble.

Photograph by T. A. Metcalfe, Pickering.

LONG-TAILED FIELD MOUSE.

There is a well-marked variety of this mouse known as *Mus flavicollis,* which is larger and pure white instead of bluish white underneath. It also has a complete yellow band across the throat. I have also caught specimens in which the brown throat spot is continued in a distinct line right away down the centre of the belly.

Photograph by T. A. Metcalfe, Pickering.
HOUSE MOUSE.

The common House Mouse is so well known—in fact only too well known in some places—that there is little need to say much about it. In many places in the country its flesh is still believed to be a sovereign cure for many ills that flesh is heir to. A friend of mine, a doctor in Norfolk, had an obstinate case of whooping cough in a child which nothing seemed to relieve. At last the mother asked if she might give it a mouse. My friend was considerably astonished, but said yes, as it could not do the child any harm, and immediately after eating it the curious thing was that the cough began to get better. I was once asked by an old woman to skin her a mouse so that she might roast it for her little granddaughter who was suffering from some childish ailment.

The common Brown or House Rat, known as Ratton in the country, is also only too well known, and I could easily write a small volume upon it—its ways, habits, and destructiveness. I had the honour in assisting to kill, together with my friend the Rev. C. H. Coates, the biggest rat yet recorded. This was at Claxton Hall, Yorkshire. We had just finished a most successful day's ferretting, and as a last draw put three ferrets under the roof of an old pigstye. They all came out badly bitten, and after we had pulled off most of the tiles a huge buck rat, as grey as a badger, jumped to the ground and was almost torn in pieces by an Airedale terrier. He measured twenty inches from the tip of his nose to the tip of his tail, and weighed two pounds and three-quarters. This was on 17th November, 1896. I quite believe that there are rats as large, if not larger, in some of the big sewers and warehouses, but the ratcatchers never trouble to weigh them. Sandy coloured specimens and others spotted with white, and even pure white ones, are at times obtained, and there is a well-known dark variety, known as the *Mus hibernicus,* common in certain parts of Ireland, and also occasionally taken in England and Scotland. It has before now been confused with the real old black rat *Mus rattus.*

The Voles differ from the true mice in having short tails and noses and ears, smaller eyes, a more corpulent form, proportionately shorter limbs, and in the arrangement of their teeth. The Short-tailed Field Vole is a most destructive little rodent, at times devouring everything before it, and eating up all the grass on the sheep runs, and spoiling what it could not eat. It seems to have indeed a much more decided preference for grass land than for arable. It varies greatly in size. I have taken one specimen which measured nearly six inches from tip of nose to end of tail. As boys we used to have great fun putting bumble bees down the burrows of the short-tailed field voles, and making them act the part of miniature ferrets and bolt the voles.

The Red Bank Vole is a very pretty mouse, easily distinguished from its commoner cousin, the short-tailed field vole, by its beautiful reddish colour and longer ears and tail.

Photograph by C. Reid, Wishaw.

COMMON RAT.

Photograph by C. Reid, Wishaw.

SHORT-TAILED FIELD VOLE.

Photograph by T. A. Metcalfe, Pickering.
RED BANK VOLE.

At one time it was considered a rarity, and when one was captured it was frequently recorded in the pages of the natural history papers and magazines, but in many places it is quite common, frequenting wooded banks and hill sides, and frequently coming into gardens. I have seen a specimen of this mouse, a female, measuring six and a half inches in length from tip of nose to tip of tail. They will eat almost anything.

The Water Vole, often mistakenly called the Water Rat, is common throughout the land, frequenting the sides of rivers, streams, lakes, and ponds, where they often do a great amount of damage by undermining the sides of the banks. They are almost entirely vegetable feeders, and I have known them very destructive to certain lilies and ferns. I once saw a very pretty sight in connection with the water vole. A stream had been dammed up for sheep washing, and as I was sitting on the bank some way below, watching the water rise, I suddenly saw an old water vole swimming across the stream with a young one in her mouth. She placed it high and dry in the midst of a large tussock of grass on the opposite bank, and then returned and brought another out of her flooded nest. This she did four times, till all were in safety. I have known them take apples across a stream into their holes, but this they generally do by pushing the apples before them. The water vole is often accused of taking fish ova and fry, and also young birds, but I have studied its habits for years and I hold all these accusations not proven. The common house rat is the real depredator.

Photo by W. J. Clarke, Scarborough.
OLD ENGLISH BLACK RAT.

The old English Black Rat is, I consider, one of the neatest of our smaller mammalia. It is such a thorough-bred looking animal compared to the ordinary rat. But I very much doubt whether at the present moment there are a dozen genuine descendants of the old original race in the country. It is nearly always obtained nowadays in seaport towns, ships bringing the rats, which often get to shore and breed there, and when specimens are obtained inland they are often brought thither by barges and canal boats. I have kept them in confinement, but though they thrive well enough I never could get them really tame. Their colour, smaller build, longer ears, and much longer tail easily distinguish them from the common rat.

Photograph by T. A. Metcalfe, Pickering.
WATER VOLE.

Oxley Grabham

WILD BEASTS AND THEIR WAYS.

A series of articles on popular Zoology.

By Sir Harry Johnston, G.C.M.G.

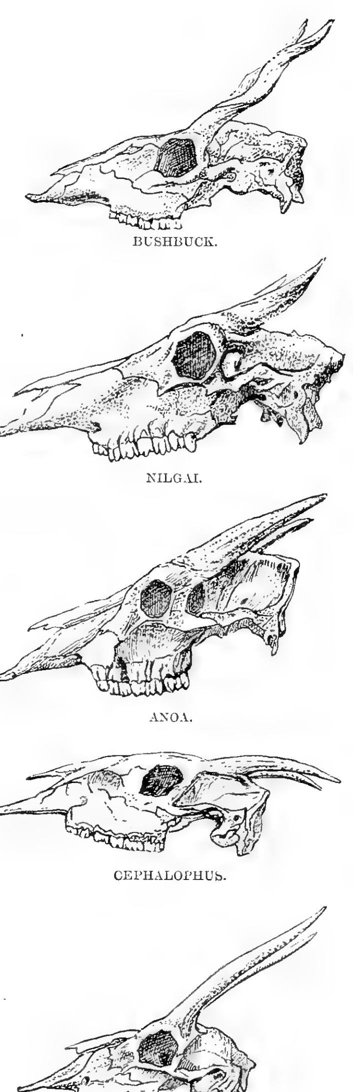
III.—ANTELOPES (Part I.)

Illustrated with original drawings, paintings, and photographs by the Author and others.

THIS article is not intended for the information of scientific zoologists, but it occurred to the present writer that a large number of the readers of this magazine are possibly not fully acquainted with the grouping and characteristics of the ruminants generally styled Antelopes, and many of these readers at the present time may be residing in or exploring distant parts of Africa and Asia where such animals abound, and may be glad to have some concise ideas as to their classification and characteristics.

As a matter of fact, "antelope" is a somewhat misleading term when applied to all those hollow-horned ruminating Artiodactyles* which are not oxen, sheep or goats, or Capricorns,† because at present the term antelope is held to apply in common parlance not only to the Gazelles and other ring-horned creatures (to which apparently the old Greek name from which antelope is derived was given), but also to the very dissimilar Tragelaphs or spiral-horned Cavicorns. These last are really an independent group of equal value in their classification to the oxen, to which indeed the tragelaphs are more nearly allied than to the gazelles. It will be the aim of the present writer to give as concisely as possible the general conclusions of scientific zoologists (to which he ventures to add a few opinions of his own) as to the evolution and grouping of these beautiful and interesting forms.

At the beginning of the Tertiary epoch, ungulates or hoofed animals had already differentiated from a stock which had also given rise to the ancestors of the Lemurs, Monkeys, and Man, and also to the carnivorous mammals; and from these ungulates at a very early stage were evolved (amongst other developments) two orders which diverged from each other in this manner:—The early ungulates all retained the primitive five-toed feet; but one group as it walked began to lay particular stress on the third and fourth toes of each foot (equivalent to



Comparative Table of Skulls of Tragelaphs Buffaloes and Antelopes.

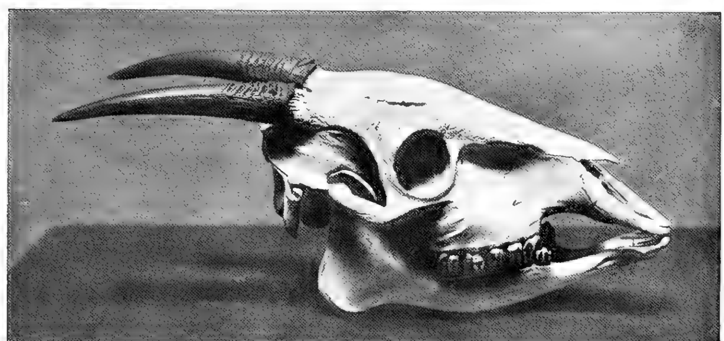
From original drawings by the Author.

* *i.e.*, Even-toed Ungulates.

† The goat-like Mountain Antelopes.

our second and third fingers), while the other lent its weight chiefly on the third toe alone (equivalent to our second finger). The group which walks equally on its third and fourth toes has been classified as Even-toed Ungulates or *Artiodactyla*, and the other, where the stress was laid on the central or third toe, is entitled the *Perissodactyla* or Odd-toed Ungulates. The *Artiodactyla* at the present day are represented by the Hippopotamus, the Pigs, Camels, Chevrotains, and the Pecora (deer, giraffe, oxen, sheep, antelopes, etc.); while the *Perissodactyla*, a vanishing order, can only show such forms as the Horse, the Rhinoceros, and the Tapir. The original five-toed condition very soon disappeared. The *Artiodactyla*, that is to say, soon lost their first finger (our thumb), or first toe, and the *Perissodactyla* reduced their toes as a rule to only three, and in the case of the horse to only one.*

The *Artiodactyla*, after developing in the earlier stages such forms as the hippopotamus, the family of swine, the camel (besides innumerable other families now extinct), developed along the middle line of descent a group not very distantly related to the pigs, which is known as the *Tragulidæ*, or Chevrotains, and from this group in all probability is descended at the present day the vast concourse of deer, giraffe, oxen, sheep, goats and antelopes. The Chevrotains, like so many other interesting parent groups, are only represented at the present day by a few inconspicuous forms. These are the Pigmy Musks or Chevrotains of Eastern Asia (nothing whatever to do with the Musk Deer), and the *Dorcatherium* of West Africa. These little creatures are hornless. They possess four complete toes on each foot. The males have upper canine teeth which are developed into long tusks. Their fur, especially when young, is marked with white spots and stripes, and the stomach is intermediate in character between the most advanced ruminating type and the simpler digestive apparatus of the pig. In common, however, with all the other Pecorines, the *Tragulidæ* have absolutely *no incisor* teeth in the upper jaw, while in the lower jaw the canine tooth assumes the form of an incisor, and is closely pressed against the real incisor teeth. The reader's attention should be drawn particularly to the white spots and stripes of these Chevrotains, which appear to be a very ancient characteristic of the mammalia, more ancient perhaps than the black spotting and striping which is so marked a feature of the carnivores, but which, like the white markings, may go back concurrently to a reptilian origin. The white spotting and striping is exhibited also by primitive Perissodactyls like the existing Tapir (in its young stage); perhaps also in the horse, where, however, by a curious extension or exaggeration the white or



Photograph by W. P. Dando, F.Z.S., Regents Park.

SKULL OF CEPHALOPHUS SYLVICULTRIX.

* The horse, of course, still retains two splints or vestiges of the second and fourth toes on either side of the great central digit.

light-coloured markings have left narrow intervals of darker fur that in time have come to be considered stripes, though the diversification has probably originated by the exaggeration of the white spots and stripes. These white or light-coloured markings again reappear in the juvenile stage of most pigs. They persist often to old age in the Tragulines, and, as I have already stated, they are markedly present in the deer and the musk deer. They may be the origin of the network of markings on the Giraffe; and lastly, they reappear (very slightly) in the more primitive types of oxen, and in one group of so-called antelopes—the Tragelaphs (eland, kudu, bushbuck).

Early in the history of traguline development arose a tendency in the males to develop bosses of bone on the forehead with which no doubt they butted their rivals or foes. Nature is constantly repeating herself, and she has developed similar excrescences on the skulls of reptiles and in many other forms of mammalia than the creatures now under consideration. It has been, however, chiefly amongst the immense and varied group of hoofed animals—five-toed, even and uneven—that so-called horns or excrescent growths of bone on the skull have been developed for purposes of offence and defence, and the same end has been attained by a somewhat different process in the case of the rhinoceros, which on thickenings of the nasal bones has developed firstly bumps of stiff hairs, and gradually from these hairy bumps imitation horns of coalesced hair. By that curious and as yet undefined parallelism so characteristic of nature's action, horns—that is to say, bony projections of the skull covered with hair or horn—have been developed in several different ways in the evolution of the pecorines. It is necessary to refer briefly to the different forms of these projections, in as much as they are the principal means of classifying the pecora or horned ruminants. These are in consequence divisible into the following families or groups: (1) the Deer, (2) the Giraffes, (3) the Prongbuck, (4) the pecorids proper, generally known as the *Bovidæ* or ox-like group. In the deer the horns seem to have begun (as in the muntjaks of the present day) by the growth of a bony projection from the frontal bones of the skull (the "pedicel"), from which again springs a further growth of bone which, in all forms of deer but one or two, branches one or many times. This great extension of bony growth from the pedicel is covered continuously with blood vessels, skin, and hair, until such time as its growth is complete. Then the blood ceases to circulate, the skin dries up, and is rubbed off, leaving the naked bone or antler. This, too, "dies" and falls off (once a year in most cases), leaving only the pedicel still projecting from the skull. In the case of the giraffes (so far as living forms are concerned) the horns are bony projections from the frontal and parietal bones of the skull of separate growth, but ultimately fused with the skull bones. In the giraffe these bony projections are continuously covered with skin and hair like any other part of the skull. In the Okapi it would seem that about three-quarters of an inch of sharp naked bone projects from the top of the hairy "horns." In extinct forms of giraffe the bony core grew to extravagant lengths and developments, and quite possibly may have been covered with a horny rather than a hairy sheath. In the third family,

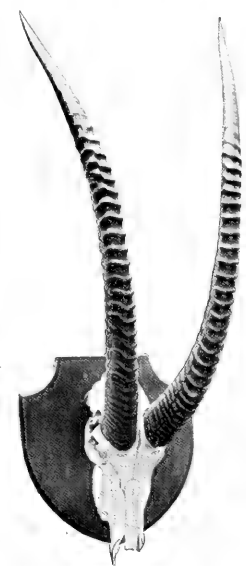


Photo., W. P. Dando, Regents Park.
SKULL AND HORNS OF SABLE ANTELOPE.
Showing rings on horns.

which is only represented at the present day by the prongbuck, a horny projection grows out from the pedicel or bony core, and this, which may answer to the velvet of the deer's horns, falls off every year. In the fourth and last family—the bovines—the bony core grows continuously often to great lengths from the skull, and is covered throughout by a horny sheath which is of greater length than the bony core that it covers. In the dead animal this horny sheath is easily detached, and it is even said that some existing forms of antelopes during lifetime can shed from disease or other causes the horny coverings of the *os cornu*. Therefore the *Bovidæ* or family of Artiodactyles, to which the antelopes belong, are termed the hollow-horned ruminants (*Cavicornia*).

But it is also in the shape and appearance of the horns that the *Bovidæ* are again subdivided into two distinct groups (according to the views of the present writer). These are the ox-like forms—the oxen and the tragelaphs—in which the growth of the horn from base to tip is relatively continuous; and the antelopes proper (including the sheep, goats, and capricorns), in which the growth of the horn, at any rate for two-thirds of its length, is marked by nearly complete annulations or rings, often forming very marked projections or knobs. (Compare, for instance, the relatively smooth and uninterrupted surface of an ox horn with the regularly spaced knobs on the horns of an ibex, the rings in the horns of certain sheep—especially in the female—and the still more marked projecting ridges on the horns of almost all antelopes). If this feature was unaccompanied by other points of difference, it should not be allowed to weigh too strongly in the classification of the different forms of a group which like the bovines is such a homogeneous one; but there are other details connected with the soft parts, the bones of the feet, the number and shape of the teeth, and the markings of the skin, which, so to speak, take sides and lend importance to this small detail in horn growth as a distinguishing feature between the oxen-like creatures on the one hand (oxen and tragelaphs) and the antelope-like creatures on the other. At the same time it should be pointed out that in those two groups of antelopes—the cephalophines and the capricorns—which are perhaps most primitive in structure among the antelopes, the annulations in the horn growth are least marked; while among the buffaloes, which are the most primitive of living oxen, and here and there amongst tragelaphs, there

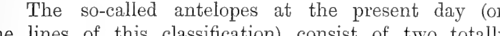
From a Drawing by the Author.

YELLOW-BACKED DUIKER.

are cracks or undulations in the *laminæ* of the horns which suggest imperfect remains of former ridges. It is permissible to assume that when the parent form of the modern *Bovidæ* differentiated itself from the stock that equally gave rise to the deer and the giraffes, the triangular horny sheaths of its bony skull prominences grew at first in an undulating manner, leaving these circular or semi-circular projections which among the antelopes retain so marked a character. Here and there amongst the antelopes, however (as in the case of the gnu and of certain sheep and goats), the regular annulations have almost disappeared, either by fusing into continuous longitudinal ridges or smoothing down into slight undulations.

Photo. by W. P. Dando, Regents Park.

BAY DUIKER.



The so-called antelopes at the present day (on the lines of this classification) consist of two totally distinct stocks. There are the *Antelopes proper*, which also include as their near relations the Goats and sheep, the Capricorns or Mountain Antelopes (which are the ancestral forms of the goats and sheep), and, perhaps, the Musk ox, which may be an aberrant capricorn; and the *Tragelaphs* (eland, kudu, etc.), a group of almost independent value which exhibits, perhaps, more primitive characteristics than any other existing bovines, and the nearest affinities of which are with the oxen.

It would widen the scope of this paper far too much to attempt to describe here the goats and sheep and the capricorns. The two first have been quite sufficiently well illustrated in numerous works on zoology. Much less is known about the capricorns, especially as regards their soft parts.

The so-called "antelopes," therefore, will alone be illustrated in this article. Their classification may be set forth as follows:—

Gazelline group.—1. Cephalophinæ (duikers, four-horned antelope).
2. Neotraginæ (dwarf antelopes, oribis, klipspringers and dik-diks).
3. Gazellinæ (gazelles; perhaps also saiga and chiru, Indian blackbuck, pallah [?]).
4. Cervicaprinæ (waterbucks, reedbucks, etc.), from which springs perhaps—
5. Hippotraginæ (sable and roan antelopes, addax and oryx).
6. Bubalidinæ (hartebeests, topis, and gnus).

Tragelaphine group—1. Boselaphinæ (nilgai).
2. Tragelaphinæ (eland, kudu, inyalas, bushbucks).

Those who are sufficiently interested in tracing out the descent of these groups and their inter-relations would find in my work on British Central Africa, on page 310, an attempt to express my own conclusions in a diagram.

Of all existing gazelline forms the most primitive, perhaps, are the *Cephalophines.* These are represented at the present day by about twenty-two species in Africa of the genus *Cephalophus*, and by the allied four-horned antelope of India, a remarkable genus in which the male develops a second pair of horns nearly exactly over the eyes.*

The cephalophines of Africa are once more divided into two groups. In the one, which constitutes the majority of the species, the horns (which are often present in the

* This duplication of the horns in the *Bovidæ* not infrequently occurs as a sport perpetuated by domestication in the Sheep. Among the Giraffes, which—as regards the horns alone—represent perhaps the most primitive type of Pecorine, bony prominences may be duplicated or may arise as a single central boss in addition to the original pair.

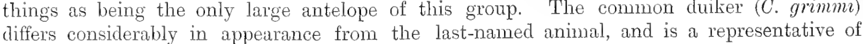
female as well as in the male) are directed backwards in a more or less continuous line with the profile of the nasal bones. The ears also are rounded. In the other group, often called the true duikers*, the horns rise perpendicularly from the skull and form an angle with the nasal profile; but the females are usually hornless, and the ears are long and pointed. All the duikers have *four mammæ*, and a naked wet nose and muffle. They are also marked out from other antelopes by the so-called tear bag (anteorbital gland) along the sides of the muzzle in front of the eyes, forming a long naked line or slit. The false hoofs which mark the vestiges of the second and fifth toes are present. The molar teeth have low crowns. The tail in a few species is quite long, but in others is shorter and tufted, though never absolutely short. Throughout the *Bovidæ* no trace has ever been found in existing or extinct species of an upper canine tooth which cuts the gum, the tooth which so often in the tragulines and deer develops into a tusk. But it has been stated that occasionally in the fœtus or young of a cephalophine traces are found of an imperfectly developed upper canine tooth. The shape of the head in these little antelopes has certainly something pig-like about it, recalling very strongly a resemblance to the chevrotains and some of the lower types of deer, a resemblance accentuated by the usually rounded ears, large head, and short legs. Their stomachs are somewhat simpler in construction than among other *Bovidæ*, but curiously enough they lack a gall bladder.

BLACK DUIKER.

HARVEY'S DUIKER.

COMMON DUIKER.

In the true duikers and in the four-horned antelope of India the females are hornless, but in most of the other cephalophines the females carry horns. The largest of the cephalophines, and in some respects the most primitive and noteworthy, is the yellow-backed duiker (*Cephalophus sylvicultrix*) of West and Central Africa.† I therefore give an illustration of this animal. It is nearly as large as a small donkey, though much shorter in the limbs. It has a very cow-like aspect, and its horns, though they are slightly annulated, irresistibly recall in their shape, direction, and somewhat triangular formation the horns of the Anoa, the most primitive of the buffaloes. The creature also suggests resemblances to the capricorns or mountain antelopes, which were the ancestors of the goats and sheep. We know very little about its life history, and travellers in Western or Central Africa who may chance upon this article are strongly urged to discover new facts about this rare cephalophine, remarkable amongst other things as being the only large antelope of this group. The common duiker (*C. grimmi*) differs considerably in appearance from the last-named animal, and is a representative of



* This, like the names of so many antelopes, is a Cape Dutch term meaning "diver," from the habit the antelope has of suddenly ducking into thick bush and thus disappearing. It is really the same word as "ducker" in English.

† Formerly the distribution of this animal was thought to be confined to the coast regions of West Africa. It is, however, met with almost throughout the Congo basin to the verge of the Uganda Protectorate, and has recently been obtained from the northern parts of British Central Africa.

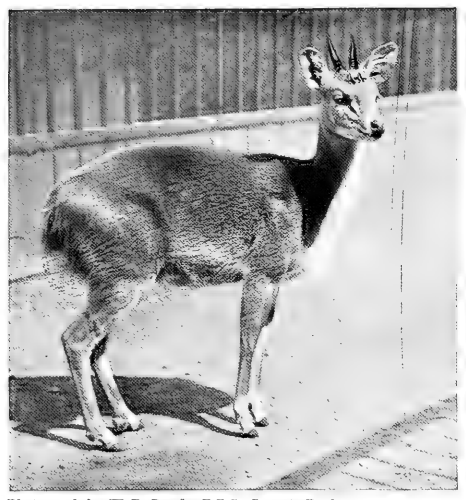
the second group of duikers (the "true" duikers), in which the horns rise nearly vertically from the skull. It suggests resemblances to the Neotragines.

Photograph by Author.

COMMON OR TRUE DUIKER.

The *Neotragines* include a number of small antelopes in which the tail is nearly always short. Horns (which are short, straight, and either vertical or directed slightly backwards or forwards) are confined to the male only. The muzzle is naked in some forms, hairy in others. The anteorbital glands (the "tear bag") are represented by a small circular hole instead of the slit of the cephalophines. In some forms the *mammæ* are *four* in number, in others they are reduced to *two*. One group of these little antelopes develops a long and inflated nose, ending almost in a proboscis. Most of these little animals are aberrant types related to the cephalophines and "leading nowhere," but the Oribis are more primitive, and may be on the line of ascent to the Cervicaprine group and the gazelles. Among notable neotragines are the Klipspringer (*Oreotragus*), the Oribis (*Ourebia*), the Steinboks (*Raphicerus*), the pretty little Zanzibar antelope (*Nesotragus*), the Pygmy antelope of West Africa (*Neotragus*), and the Dik-Diks (*Madoqua*). The Klipspringer is a specialised form which has adapted itself for living on mountains and rocks. It walks on the very edges of its main hoofs, no part of the pastern being on the ground. The muzzle is very short. The horns are simple and upright, and are usually present in the male. The fur is of quite a peculiar nature, the hairs being almost like flattened spines, very loosely attached to the skin, in that respect like the hair of certain deer and of the musk deer. The range of this animal is pretty extensive all down the eastern half of Africa, from the vicinity of Suakim to (formerly) the Cape of Good Hope. Apparently the klipspringer (of which a good illustration is given in my work on British Central Africa) has never been obtained from any part of Africa west of the White Nile. The ease with which this animal jumps vertically is quite remarkable. I have had tame specimens in captivity which one moment would be standing on the floor and the next have leapt on to the top of a piano or high shelf. On the rocky mountains they bound recklessly from crag to crag, and will leap downwards considerable distances, alighting on all four feet.

The oribis are sometimes as large as a sheep, with longer necks and legs. They are of great interest in classification as a type that is perhaps ancestral and basal. One



Photograph by W. P. Dando, F.Z.S., Regents Park.
FOUR-HORNED ANTELOPE.

species of oribi, the Abyssinian—if no others—has four *mammæ,* and exhibits traces of an upper canine tooth in the immature male. The horns are straight, and but that they are ridged in the lower part are somewhat similar to the horns in female gazelles. There is a naked glandular patch below each ear similar to that found in the cervicaprines, with which group the oribis have marked affinities. Except that the tail is usually short, these little antelopes come very near to representing the stock from which the cervicaprines and, perhaps, gazelles were derived. It is possible that the oribis may, like so many other small antelopes, have lost the need for a long tail, and it has thus degenerated recently into a short and bushy appendage. At the same time, in reviewing the various groups of antelopes, tragelaphs or deer, one is often led to wonder whether it may not be possible for a beast to re-develop a long tail (to suit special requirements) by forming once more caudal vertebræ in place of those that have been lost in a previous state of development. The domestic sheep, for instance, has a long tail, whereas every known species of wild sheep* from which it might have been derived has a short tail. Is it necessary that we must predicate an extinct species of long-tailed sheep as the origin of the domestic form, or is it possible that in domestication the sheep may have been able to reproduce vertebræ to strengthen a lengthened tail?

The Pygmy antelope (*Neotragus*) is only found in West Africa, where it is often called the Royal antelope. The horns are barely an inch long, and are only present in the male. It is remarkable as being the smallest example known of the ruminating animals. It is an independent and isolated development of the neotragines.

The Dik-diks are also very small antelopes with rudimentary tails, short, straight horns, present as a rule only in the male, with a last lower molar tooth in a degenerate form, and (in most examples) with a swelling of the nose cartilage and a lengthening of the tip until a pig-like snout or proboscis is formed. The ears are also rather pig-like. But the dik-diks are much specialised, and not really primitive in structure. At present they are only found in eastern Africa and in Damaraland.

The Gazelles are a very distinct group of antelopes, offering in some forms so marked an outward resemblance to the sheep as almost to suggest that they have some derivation in common from an ancestral type of capricorn.† With the gazelles are usually associated the Saiga and Chiru antelopes, the Indian Blackbuck, and the remarkable *Dorcotragus* (Beira or Bahra antelope). Some also class the pallah with the gazelles, but in the opinion of the present writer this is a moot point, the pallah, also offering resemblances to the hartebeests and cervicaprines.

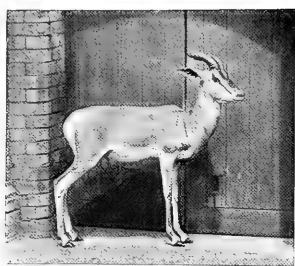
* Except, of course, the Wild Sheep of North Africa, which in my opinion is no true sheep at all, but an independent development from the Capricorn stock, allied to the Thar Goat of India and Arabia.

† The horns in such Capricorns as the Chamois and the Rocky Mountain Goat are not at all unlike the Gazelline type. It is probable, however, on the whole, that the Gazelles are derived from the Neotragines or Cephalophines, the last-named offering some points of resemblance to the Capricorns.

The general characteristics of the gazelle family, including all the aberrant forms mentioned, are as follows: with the exception of Saiga there are only *two mammæ*; the muzzle is invariably hairy (*i.e.*, there is no naked wet nose and muffle); in the true gazelles, and in a slight degree in the saiga, the horns are curved backwards and then slightly forwards towards the tip, and are more or less lyre-shaped in their arrangement; that is to say, that the recurved tips very often face each other. The females in most of the aberrant types are hornless, but in all but four species of the true gazelles bear horns, in which case, however, the horns are far smaller and slighter than those of the male, and are sometimes quite straight and upright as in the neotragines. Of the true gazelles there are something like twenty-five distinct species, which range in their present distribution from Western China and Tibet across India, Persia, Syria, and Arabia to North Africa, and thence over all parts of the continent with the exception of the well forested regions. In the African distribution of the gazelles there is in fact a somewhat remarkable blank. No true gazelle is found anywhere in the forest regions of West or Central Africa or south of German East Africa; that is to say, there is no true gazelle on the West Coast of Africa south of the Gambia, nor in the whole of the Congo Basin, Angola, Zambezia, Nyasaland, or South Africa. Yet the range of the gazelles must once have overstepped these limits; for a form of true gazelle reached South Africa from the north, and there became specialized south of the Zambezi into the well known springbuck, which is somewhat unnecessarily made into a separate genus under the name of *Antidorcas*. The springbuck has lost a premolar tooth, and has developed along its back a peculiar long, evertible fold of skin which it can open at will, thereby displaying an extraordinary blaze of white under-fur all up the back. Its tail is rather long for a gazelle, but in horns and in characteristic face and body markings it agrees with the true gazelles. The springbuck at one time was found in uncountable myriads in Africa south of the Zambezi. It is a lovely creature, with its pure white belly, back, insides of the limbs, throat, face, and ears, the rest of its pelage being reddish-yellow with a broad black band along the flanks, separating the golden upper parts from the snowy-white belly. There is also a broad blackish-brown streak (so characteristic of the gazelles) from the base of the horns over the eyelids, along the side of the face to the corner of the mouth. The extraordinary leaps of the springbuck and the appearance of the vast herds in which it travels have been admirably illustrated by Mr. J. G. Millais in a "A Breath from the Veldt."

Specially remarkable gazelles are the Grant's Gazelle (the largest animal of the sub-family, with very long horns), the brightly coloured Thomson's Gazelle, the long-horned Loder's Gazelle of North Africa, Speke's Gazelle with its ribbed nose, and the big and handsome Soemmering's Gazelle (with its large and very lyrate horns and grey muzzle). In Somaliland and the eastern horn of Africa the gazelles have developed

Photograph by Norman B. Smith, Esq.
THOMSON'S GAZELLE.



Photograph by W. P. Dando.
SOEMMERING'S GAZELLE.

two very strange forms—the Dibatag (*Ammodorcas*), and the Gerenuk (*Lithocranius*). The nearest ally of these creatures, curiously enough, seems to be the Indian Gazelle (*G. bennetti*). The Dibatag and the Gerenuk have both developed giraffine necks. Their heads are disproportionately small for their bodies. The female in each case has no horns. The coloration is in the main gazelline, and the horns do not differ very widely from the gazelline type. The limbs are long, the tail is also long, and in the dibatag is developed to an extraordinary extent with a tufted tip. When running the dibatag holds its long neck well back and the tail is directed stiffly forward, so that in an extreme attitude the back of the head and the tip of the tail nearly meet. Both these creatures feed largely on the leaves of trees, which no doubt accounts for the lengthened neck; and both of them (but especially the gerenuk) have acquired the habit of standing upright on the hind legs, both for observing the surrounding country and for reaching high branches, and even for concealment, the upright body and perpendicular neck with the fore limbs lightly placed for support against a branch looking very much like a tree trunk. The gerenuk, however, when in flight runs with its neck extended horizontally, unlike the dibatag.

The Saiga, amongst many other points of interest, is the only antelope which exists at the present day within the geographical limits of Europe. It is found in the eastern part of European Russia (besides its much wider range over Central Asia and southern Siberia). But formerly it existed in Great Britain—say, some hundred-thousand years ago—as well as in Belgium, France, and Central Europe; while in historical times it was still found in Poland. The saiga differs from other antelopes in only having two lower premolar teeth, but as some fossil remains of the saiga show the existence of three premolars, this point is of little classifactory importance. The females are hornless, which is a primitive characteristic, and the *mammæ* are four in number, a point in which the saiga is more primitive than any other existing gazelline form. In its outward appearance it has a very sheep-like aspect, especially about the feet, the thick, woolly-looking coat and the rather small cropped ears (which indeed look as though they had been artificially clipped). The horns (which are gazelline in shape) are remarkable for their invariable light yellowish colour. The most striking and extraordinary feature of the saiga, however, is its enormously inflated nose, at the end of which the nostrils are prolonged into a hairy snout. This curious inflation of the nasal cartilages is one of those characteristics of antelopes which has a tendency to crop out apparently independently in diverse genera. It has already been described in connection with certain neotragines.

Photograph by S. G. Payne.
SAIGA ANTELOPE.

(*To be continued.*)

THE LIFE STORY
OF
THE PRIVET HAWK-MOTH
(Sphinx Ligustri).

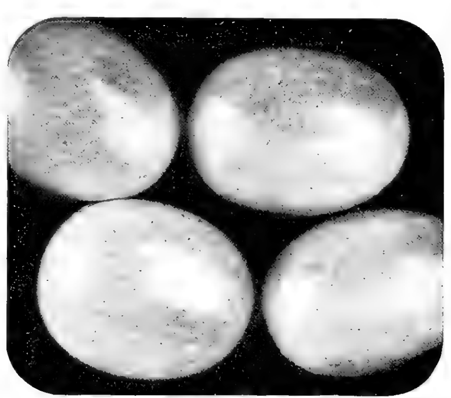
BY JOHN J. WARD.

Illustrated with photographs by the Author.

EGGS OF PRIVET HAWK-MOTH.
As deposited by the insect. (Natural size.)

THE embryo Privet Hawk-Moth appears first as a small pea-green somewhat oval-shaped egg, and is deposited by the female moth about June or July amongst the branches and leaves of the food-plant of the larvæ, which as its name implies is the common privet, although sometimes the lilac or elder is selected. The eggs are very difficult to find as they are usually deposited well in the hedge amongst the branches. On the morning of 7th July of this year, I captured a fine specimen of the female moth resting on a post; towards evening of the next day it began to deposit its eggs, and within three days it had laid 180 fertile eggs, from which number to 200 I should regard as being about the average number laid. The ova when examined by the microscope reveal considerable shell structure, showing a finely granulated and reticulated surface. These remain about nine or ten days before hatching, although the temperature may influence the time. The first larva of the brood already referred to emerged about mid-day, 17th July, after which they appeared rapidly. After the young larva leaves the egg the shell becomes white and translucent.

On emerging the larva is of a whitish or yellowish green, but as soon as it begins to feed it seems to assume a deeper tone of green. For a time the young caterpillar is occupied in spinning a silken thread by means of which it attaches itself to a leaf, this it altogether dispenses with as it gets older and its claspers become stronger. When firmly secured it starts to feed—the amount of vegetation that they consume is simply astonishing. The young and full-grown caterpillars possess many points of difference. The former during its first two moultings possesses none of the brilliant colours and purple stripes of the older caterpillar, the stripes being white only; also, the skin of the young larva bears a rough granulated surface which later becomes smooth and tightened and assumes its bright colours. The first appearance of an immediate moult is a tightened and somewhat distorted appearance of the caterpillar; the larva then by a muscular effort breaks the skin, which seems to separate naturally round the head, leaving the latter still covered; the skin is then slowly passed down the body towards the tail extremity by a wavy



EGGS OF THE PRIVET HAWK-MOTH.
As seen by the microscope, magnified about twenty-five diameters.

LARVA OF THE PRIVET HAWK-MOTH.
The caterpillars on the branch to the right were 21 days old, and those on the branch to the left 31 days when photographed.

muscular movement, assisted by the occasional withdrawing of the claspers. Finally it reaches the horn at the tail end, which at first glance appears to present difficulties; however, as the moulting skin nears it, it is bent downwards flat to the body, pointing tailwards, the skin then slipping gently over it, and when about half-way the horn is sharply withdrawn, and this gives the final impulse to the cast skin, which then gently slips off the end segments and claspers, and almost simultaneously the mask skin from the head falls off like a cap, having remained on during the whole of the moulting process. This head covering is much stronger than the body skin, being somewhat horny in texture. The whole process occupies about five minutes.

The feet and tail-horn are now of a pink colour instead of black, assuming the latter colour as another moulting season nears; and likewise the black patch on each side of the head has disappeared with the mask, being now green like the body. As examples of the rate of growth of the larvæ, in the third illustration is shown to the right a few of the young larvæ which I photographed twenty-one days after emergence, while to the left is shown others from another brood thirty-one days after emergence. When full-grown these make remarkably beautiful caterpillars, of a bright green colour with seven oblique streaks of white and shaded purple on each side of the body, with other markings of pale yellow and orange along the back and around the spiracles, contrasted by the dark markings round the head and black horn at the tail.

If the larva survive all the troubles that beset caterpillar life, about the end of August or early in September its ever increasing appetite seems to decline, and after taking things very leisurely for a few days it eventually wends its way down the branches to the soil below and, after carefully surveying the ground several times over, selects a nice easy place where soil and leaves make so far as possible a light mould, into which its robust form slowly disappears from view. It enters the soil in a slanting direction, and usually takes from three to five minutes to completely disappear, after which we see no more of it until it comes out a perfect and fully developed moth sometime probably in June or July of the following year, although occasionally from some cause they remain in the pupa for two years. If we prevent it going below the soil so as to watch its transformation, we observe its brilliant colours slowly fade, and its skin becomes distorted in a manner that leads the inexperienced to imagine that it is dying; eventually, however, the last caterpillar skin breaks away, and we find instead of our handsome caterpillar a reddish brown chrysalis or pupa.

If all has gone well with our specimens, in the following June we may see the emergence of the moth take place. The first symptoms of the final change is a kind of occasional convulsive movement of the pupa, and during one of these movements the chrysalis splits at the back of the head portion, and before we hardly realise what is about to take place, the head, eyes, antennæ, and fore legs of the perfect moth appear, followed almost immediately by the remainder of the body, around which the coloured wings can be seen clinging like wet rags. The moth, directly it emerges from the pupa,

Full-grown caterpillars of the Privet Hawk-Moth feeding.

CHRYSALIDES OF THE PRIVET HAWK-MOTH.

Often dug up from the soil in gardens.

ascends a branch so as to get clear of the vegetation; selecting a suitable place where its wet wings have free access to the air, it rests while these gradually dry and become expanded and rigid. Up to the present the wings of the moth have assumed the resting form of the butterfly—with their upper surfaces closed together—but now that they have acquired strength, and under the muscular control of the moth, the insect seeks the highest point of the branch, and after another short period of rest we observe a sudden flap of the wings and in an

The newly-emerged moth climbing the branch to dry—

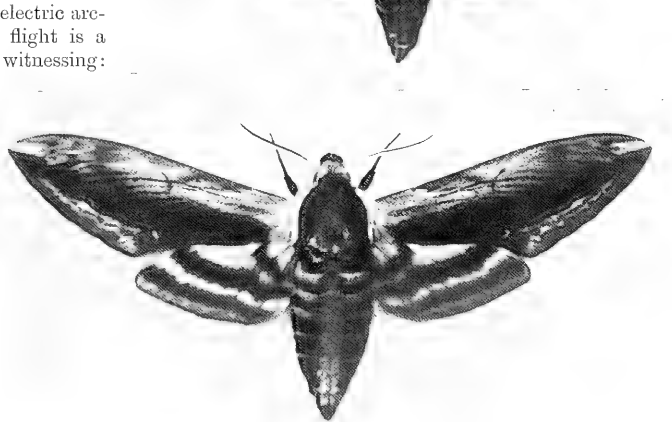
—and expand its wings.

The wings have now become rigid and fully expanded, finally—

—their position is reversed into the resting attitude of the moth.

instant the latter have become reversed to the resting attitude of the moth. The antennæ are laid along each side of the head and thorax as our insect rests, for it has now completed its metamorphosis, but is not yet capable of flight for some hours. If it emerges at night-time, as daylight approaches it may crawl lower down the branches, where it remains until night, when, given warm and favourable weather, it takes its flight and seeks its mate.

Although the privet hawk-moth is plentiful in England, the nocturnal habits of this insect offer little opportunity of observing it, especially in its powerful flight. Many natural history works give the time of flight as just before nightfall, but so far as my experience goes this insect is certainly more nocturnal than sub-nocturnal in its habits, as I have often seen and captured specimens when on the wing, and resting on the ground, round about electric arc-lights just on the outskirts of the town, at midnight and during the early hours of the morning. To see a large specimen of this moth whirling round an electric arc-light in its rapid flight is a sight well worth witnessing: its four and a-half inches of wing expanse—which a good specimen should measure—seems considerably greater as it continues its flight.



THE MALE AND FEMALE PRIVET HAWK-MOTH. (Natural size.)
The larger insect is the female.

The only way to fully appreciate and understand the interesting wonders and beauties in the life histories of insects is to look to the insects themselves. These in every instance reveal facts and features alike fascinating and instructive, which will more than repay the observer for any time spent in their study, and I trust that my brief description here may act as a stimulus in encouraging others to consider at the next opportunity the actual life history of this common and beautiful moth.

John J. Ward.

ANIMAL ANECDOTES.

Pony and Rattlesnake.

A California farmer, who has three small children, owns a pony which is their constant companion. They have ridden him, rolled over him, fed him, and have come to consider him as one of the family. When the children went on an expedition and did not want to ride, the pony went along as if he had been a pet dog. A San Francisco newspaper tells the following story of the pony's presence of mind:—

"One day the three children went on a nutting expedition, and while they gathered the nuts, the pony grazed near by. Suddenly, almost beneath the feet of the nut gatherers, there was an ominous whir, and they saw with horror a huge rattlesnake coiled ready to strike. The children huddled together, too much frightened to move, but as the deadly head went back there was a quick trample of hoofs, a rush through the bushes, and the pony appeared. With his four little sharp hoofs brought together he shot up into the air, landed squarely on the snake's coil, and was off again before the wicked head could strike. The interruption had released the frightened children from the charm and they ran a short distance away, then stopped to witness the contest. The rattler was wounded but full of fight and coiled again, and again the pony landed on him and got away safely. This time the snake's body was nearly severed in two places, and the snake was conquered. The pony walked round it and, apparently satisfied, gave a cheerful whinny and returned to his grazing."

With his four little sharp hoofs brought together he shot up into the air, and landed squarely on the snake's coil.

A Singular Combat.

A traveller in South Africa tells of a singular combat he witnessed. He was musing one morning with his eyes on the ground when he noticed a caterpillar crawling along at a rapid pace. Pursuing him was a host of small ants. Being quicker in their movements, the ants would catch up the caterpillar and one would mount his back and bite him. Pausing, the caterpillar would turn his head and bite and kill his tormentor.

After slaughtering a dozen or more of his persecutors, the caterpillar showed signs of fatigue. The ants made a combined attack. Betaking himself to a stalk of grass, the caterpillar climbed up tail first, followed by the ants. As one approached he seized it in his jaws and threw it off the stalk. The ants, seeing that the caterpillar had too strong a position for them to overcome, resorted to strategy. They began sawing through the grass stalk. In a few minutes the stalk fell and hundreds of ants pounced upon the caterpillar. He was killed at once, and the victors marched off in triumph, leaving the foe's dead body on the field.

A Plucky Little Bird.

The late Professor Darwin, wishing to test the bravery of a jackass penguin, placed himself between one and the water, and he relates how nothing less than heavy blows would have stopped the bird from fighting and driving him backwards until the sea was reached. Every inch the bird gained it firmly kept, standing close before its enemy all the time and never once flinching from the task before it.

Where ignorance is bliss.

A good story, illustrating the courage which proceeds from ignorance, appeared in a French paper some time ago. It was about a Cossack who was hired at Moscow by M. Pezon as an extra assistant to clean out the cages of the wild beasts. The one did not understand a word of French, and the other knew no Russian; but by dint of vivid and practical pantomime, M. Pezon succeeded, as he thought, in thoroughly acquainting the Cossack with the details of the work required. He took the rake, broom, sponges, and buckets used into the cages of some harmless animals and showed how the work was to be done. However, in the cage of a very tame antelope, he brushed and sponged the animal, as a treat for it, but not with any idea of setting an example. In the meantime the Cossack watched the proceedings intelligently and attentively, and went on with the work satisfactorily, his master going for a time into his office. Returning presently M. Pezon came into the tent in time to see his new assistant, equipped only with a broom, bucket and sponge, enter a cage tenanted by a splendid untamed tiger—the most dangerous brute in the whole collection. When the Cossack entered the tiger was asleep, but suddenly lifted its head and turned its fierce eyes on the intruder, who stood calmly dipping his sponge into the bucket of water. Poor M. Pezon, petrified with horror, saw his temporary assistant approach the great beast and begin to rub him down as stolidly as if he were grooming a quiet old horse. The soothing application of the cold water had a very unexpected and agreeable effect on the tiger, which began to purr, laid down, stretched out its paws, and rolled about as if to offer every part of its body to the vigorous scrubbing of the Cossack, who went on unconcernedly. When he had finished grooming the tiger to the mutual satisfaction of his charge and himself, he patted the big beast on the head, took up his traps and walked out of the cage, M. Pezon only being able to rouse himself out of his state of stupefaction sufficiently to prevent the man from going into another cage of dangerous animals.

The Cossack began to rub the tiger down as stolidly as if he were grooming a quiet old horse.

ROSY-BILLED DUCK—

SOME BIRDS AT THE ZOO.

Described and illustrated with Photographs by W. P. Dando, F.Z.S.

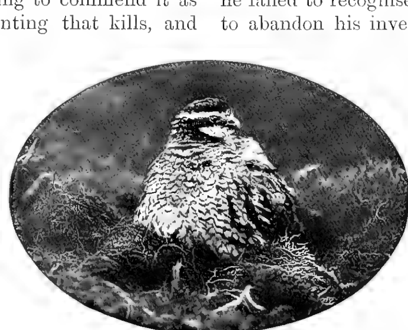
—AND YOUNG.

Rosy-Billed Duck of South America.

THE two photographs reproduced at the top of this page show this well-shaped bird sitting and with her brood of three ducklings. As will be readily appreciated, the necessity of great caution and the use of a long focus lens to enable the photographer to get a good sized picture of the duck at the greatest distance is essential. The writer feels as much pleasure in a "snap-shot" at a bird as the most enthusiastic sportsman armed with his favourite shot gun. In a recent editorial in "Country Life in America," Professor Bailey referred to animal or nature photography as "the new hunting," well marking the distinction between nature "snap-shotting" and the pursuit of wild things, the destruction of which alone gratifies. This new hunting, which under certain conditions offers quite as much risk and excitement, has everything to commend it as compared with the hunting that kills, and necessitates as much skill and patience. It also requests an observant and artistic eye to appreciate points of beauty in animals which the man with a gun seldom enjoys.

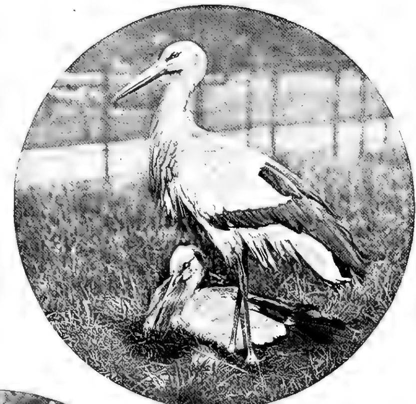
Virginian Colin or "Bob White."

THESE North American birds are commonly called by the natives "Bob White," after the name of their call, although quite a different interpretation would be given to the call, if the bird was heard in a foreign country, just as the Germans consider "Kikeriki" as the interpretation of the cock's crow, which we consider as sounding like "Cock-a-doodle-do," yet there is not the slightest similarity between the German and English equivalent to a given sound. Great quantities of these Virginian colins reach the London markets and are sold as quails, which they somewhat resemble; the colin is, however, quite a different genus. A rather curious experience occurred in connection with these marketable colins which is worth relating:—Mr. Clarence Bartlett having purchased one for experimental purposes, opened the craw to examine the kind of food these birds feed on in their wild state, and discovered therein some seed he failed to recognise, but not feeling inclined to abandon his investigation, he sowed some of it and patiently waited until it grew up into a very pretty plant, but being again baffled, he sent one of them up to Kew to be named, and promptly received a warning note, to the effect that the plant was a dangerous and poisonous one, even to the touch, and the plants were forthwith destroyed.



VIRGINIAN COLIN.

The outside world would never conceive the amount of trouble taken by the Zoological Society to find out the proper food for their vast and varied collection.



WHITE STORK.

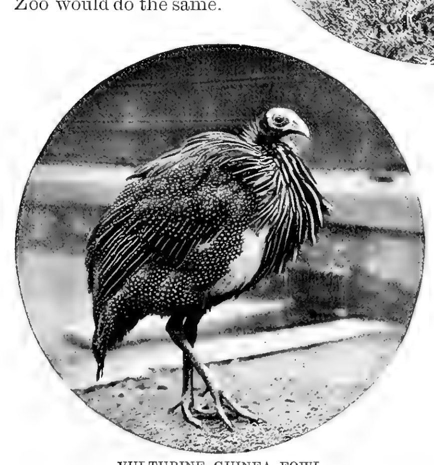
Common White Stork.

To watch these two birds build and pull to pieces a nest they were forming during about ten days was most entertaining, and the pride of the male bird as he pranced about the enclosure, sometimes taking up a position for a share of public notice at the side of the hen, has entertained many a visitor to the Zoo this summer. Soon after the nest (which was formed from all kinds of odd material) was well advanced, the birds were removed to another enclosure, but as I see no record of any common storks ever having been born or bred in the menagerie, their change of apartments caused no loss to the Society's collection. At Kew this year a pair of storks have built a nest and reared some young ones, and with more space and freedom no doubt those at the Zoo would do the same.

MARABOU STORKS.

The Marabou Stork.

ABU SEIN, as the Adjutant Stork (*Leptoptilus Crumeniferus*) is called by the natives on account of the pendulous pouch or wind bag which hangs from the root of the enormous bill of this grotesque among birds, made quite a little "side show" with his mate and drew a big audience during the one or two summer days we were permitted to have this year. Following the common storks as occupiers of their lately quitted enclosure, the comical marabous began their version of nest building by posing themselves in a series of the most amusing tableau vivants, remaining as immovable as the leopard's spots for several minutes, causing one little girl to ask: "Are those birds really alive?"



VULTURINE GUINEA FOWL.

Vulturine Guinea Fowl.

THIS very beautiful game bird resembles the vulture in the appearance and shape of the head, but in habits would be classed with the pheasant tribe, and is a native of Eastern and possibly Western Africa. The beautiful cobalt blue neck, and the æsthetic colouring

of the plumage cannot be imagined in a monochrome illustration, although the markings and the combination which makes this fowl one of the handsomest of the Phasianedæ family can be admired.

There is little difference between the male and female as regards plumage, the former is, however, slightly larger and has several wart-like prominences on each leg.

NEST OF MALE WEAVER BIRD.

Indian Weaver Birds & Nests.

At the farthest end of the Western Aviary, in the inner enclosure, is now to be seen some beautiful nests of the Baya and Bengal Weaver Birds, and the amount of ingenuity exhibited in plaiting the nest seems almost to require the manipulation of human hands. When a choice is given to these birds they always select the gayest coloured material for forming their nest and ignore more serviceable stuff. Many experiments have been made with a view of ascertaining what this tendency of the bird would show if a great variety of gay-coloured bits of string were available, and the resulting nests were as ingeniously weaved and as beautiful as human skill could have possibly made them. Indeed, the expertness of the bird in interweaving its material is such that, according to the naturalist Wilson, one old lady, to whom he showed a nest, seriously proposed having the bird taught to darn stockings! I should like to see next season what the birds would do under similar circumstances at the Zoo. It appears, however, that the possession of the artistic feeling does not always of necessity induce a sweetening effect upon the disposition, as a more quarrelsome bird could hardly be found.

WEAVER BIRDS AND NESTS.

Bower Bird and Nest.

A similar tendency to use the gaily coloured materials is exhibited by the Bower Bird, which has this year begun a nest, but the small choice of suitable material with which to build makes it impossible for any nest to be completed from which any idea of the beauty, wondrous ingenuity,

and exhibition of decorative skill could be formed. In their natural state there are certainly none (so far as is known) of the feathered tribes that exhibit such a high degree of intellect as they attest, and their architectural achievements are truly wonderful. The bower is first built by making a platform of woven twigs, along the sides of which are planted twigs held in place by being stuck into the earth. These twigs are curved inwards to meet at the top, and other twigs are interwoven to give additional strength, but great care is taken that no projections shall occur within the house to obstruct the movements of the birds. A Mr. Coxen, of Brisbane, New South Wales, was the first to ascertain with certainty that these artistic and ingenious constructions were the unaided work of these birds. The curious structures were always found decorated with ornamental objects in search for which the birds must travel the country for miles around. Shells, pebbles, feathers, bleached bones, seeds, and in fact anything decorative; even skulls are brought and placed about, not at haphazard, but in a symmetrical way which can indicate only intelligent disposition. Mr. Gould, the well-known ornithologist, picked up near one entrance a small neatly worked stone tomahawk, with fragments of blue cotton rags, both of which had evidently been purloined from an encampment of the natives.

Black Vulture of America.

THESE scavengers of America, coupled with the Turkey Vulture, which it greatly resembles, will always be associated with that great controversy between the great English naturalist and observer, Charles Waterton, and that noted American ornithologist, John James Audubon, whose chief work, the "Birds of America," was published at over £200 per copy. The dispute was as to whether vultures detected their prey by the sense of smell or sight. Audubon made experiments which he proved to show that vultures were solely guided by sight in discovering their prey, and although the Englishman tried to prove the experiments of his friend as inconclusive, the American's opinion is now universally accepted. About the middle of last century the black vulture was looked upon as quite a blessing by the inhabitants of the large cities, and a considerable penalty was imposed for killing them. At Charlestown they were commonly called "Five Pounds," from the amount of this penalty. That these birds rendered actual service in removing from the city and its vicinity all dead animals and other garbage, there can be no doubt, and as they live on no other kind of food, and are to be counted by tens of thousands, they may appropriately be called scavengers, as the following account by Ullon goes to prove: "The great number of these

BLACK VULTURE

A PAIR OF CANARDS.

birds found in such hot climates is an excellent provision of nature; as otherwise the putrefaction caused by the constant and excessive heat would render the air insupportable to human life. These birds are familiar on the tops of the houses, which are covered with them; it is they who cleanse the city of all its animal impurities. There are few animals killed whereof they do not get the offals, and when this food is wanting they have resource to other garbage, and they can trace carrion at a distance of four leagues, which they do not abandon till there remains nothing but the skeleton." In many of the vultures at the Zoo there is something to admire, but these insignificant birds are quite uninteresting and never utter a sound, except a kind of hissing noise, through the hole in the upper part of the beak. A peculiar characteristic of these vultures, in common with their group, is the absence of the voice organ in the lower part of the windpipe. Their heads being covered with a blackish wrinkled skin, bristling with short black hair, gives them a very uncanny appearance.

A Farmyard Curiosity.

To find a "freak" at the Zoo is a scarcity, yet what was sent as such in the shape of a pair of ducks, with the beak and legs of a fowl, could be seen running about in the beaver enclosure, opposite the Superintendent's Office. The officials, however, do not seem to think they are a cross between a duck and a fowl, but simply one of those monstrosities produced by in-breeding, helped very likely by removing the webbing, which is easily done with a pair of scissors soon after hatching. The birds have now been removed, and I doubt if we shall hear any more of them. I had an opportunity of handling one of them, and came to the conclusion that an inexperienced hand had clumsily cut away the webbing, leaving a trace of it protruding from the side of the toes.

❧

It is impossible in so short a space to give more than a few bare facts about some of the latest bird arrivals at the Zoo, but that the Society pride themselves on their collection of birds is an acknowledged fact, and that this is mainly due to the expert knowledge of Dr. Sclater, the Secretary, there is no doubt. I have heard it remarked by many Fellows, that if a feather of whatever kind were placed before this gentleman, he would tell immediately to what bird it belonged. The Shah's visit to the Zoo and his special admiration of the birds and commission to Superintendent Clarence Bartlett, are further proof of the beauty and variety of the Society's collection, which is one of the best if not the best in the world.

W. J. Dand

From a Photograph by C. Reid, Wishaw, N.B.

A FLIGHT OF PIGEONS

THE CARE OF DOMESTICATED ANIMALS.

By W. M. Freeman.

The Pigeonry.

We are just entering upon the season of great exhibitions, and pigeon fanciers all over the country are calculating their prospects of success in winning cups and medals at the important shows. The most important pigeon shows of the year are the Dairy Show in October, the Crystal Palace Show in November, the Pigeon Club Show (generally held at the Alexandra Palace a little later), and the Liverpool Show in January. A great deal of care has to be expended on the preparation of the exhibits at these shows, for so keen is the competition in many classes that the final decision of the judge, when two birds are equal in other points, will naturally be influenced in favour of the one which is shown in the best condition. A few suggestions may be useful in regard to exhibiting pigeons. First of all it is a mistake to send a bird to a show unless it has been properly trained for the show pen. Some weeks before the date of the show, the fancier should obtain some collapsible show pens, which can be bought for a few shillings, and accustom his birds to being in these pens, and to submit to be poked about with a "judging stick"; otherwise, when they arrive at a show and the judge goes to look at them and wants them to display their points, they will flutter about and spoil their own chances. Again, it is very important that a bird should be well fed the last thing before it starts on its railway journey. Often birds have to travel all day, arriving at the exhibition hall late at night, and it may be nearly the middle of the next day before they are taken

Photograph by C. Reid, Wishaw, N.B.

PERSIAN CAT.
(Champion Blue Jacket.)

out of their baskets and put into the show pen, with the result that they will be faint and ill. Let a bird, therefore, have a good feed and a drink of water immediately before placing it in the hamper to go away. Indian corn and peas combined make the best meal for a pigeon before being sent away, as they will last longest. Similar remarks apply to pigeons returning from a show; very often—particularly in the case of young birds—they fret at shows and do not get properly fed; consequently, on their return, they are often in a low weak state, especially if the show has lasted three or four days and has been held in a building not too well ventilated. Hard corn should never be given to birds when they come back; it may cause them to become "crop-bound." They should have soaked corn for their first meal or two—which they will generally eat with avidity—and not too much of that. Yet again, no bird returning from a show should be allowed to mix with the other birds until it has been quarantined for a few days, as there is always a great risk of diseases being brought from shows that will be liable to be communicated to the other birds in the loft.

The Cattery.

CATS need to have as much variety in their food as possible, and as a rule the single cat in a household gets a good variety—so, too, do cats kept on farms where they can poach. But for those kept in catteries a varied course of diet must always be provided. I often recommend people whose cats are not thriving to give them coarse, wholemeal, brown bread soaked in gravy or milk. This seems to have an excellent effect on the system. Fish, too, is very good for cats by way of variety. It is a mistake to give cats much starchy food such as potatoes and white bread; they need vegetable food, of course, and any one who has noticed cats (and dogs too for that matter) which have been let out into a field after being shut up will have observed how fond they are of eating a little grass. It is a very bad plan to feed cats on "lights." The lungs of animals are very often the seat of tubercular disease even though it may not be apparent, and cats are liable to be affected as a result of eating this kind of meat. On the other hand raw lean meat is undoubtedly the cat's most natural food, but it is better that what is provided should be wholesome butcher's meat.

The best way to get an animal's coat into condition is to groom it regularly—that will do far more good than anything in the way of medicine, although the latter, of course, is desirable at times. The cat is a very cleanly animal and can usually be depended upon to keep its coat tidy; but where long-haired cats are concerned they must be groomed with a comb and soft brush at least twice a day. A cat with eczema or other skin trouble will always derive benefit from the use of a brush; friction of this kind has an excellent effect

upon the skins of animals. There are several good patent brushes on the market suitable for dogs and cats, and these can be obtained either hard or soft, according to the animal for which it is required.

The Kennel.

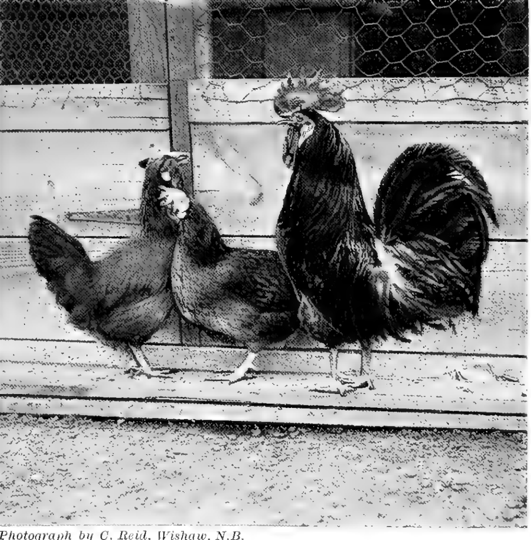
THE troubles of puppyhood are many and various, but they would be greatly lessened if people understood better how to feed and manage puppies. Very few people amongst the general public understand how to rear puppies, nor do they know much about the peculiar troubles incidental to the early life of a dog. The first most critical time is when the puppy is weaned; the change from the mother's milk to the various foods which a puppy gets in the average household is often too great, and causes general disorganisation. The most suitable food for a puppy when weaned is milk; care should be taken that he does not have too much starchy biscuit food. The puppy should in any case not be taken away suddenly, but be weaned gradually; the age of a month is the earliest time at which the weaning process should begin. Besides milk, small quantities of chopped raw lean meat may be given, and by degrees the puppy can be got on to more general foods. Puppies are often subject to what is known as the "teething" fit; this occurs when the puppy is changing its teeth. The first teeth are usually complete at from two and a half to three months, then at four to five months old these begin to be replaced by the permanent teeth; there is always more or less disturbance of the system at this age, and distemper and other troubles are likely to occur at the same time. Nothing is better for a puppy's teeth than a good big bone to gnaw. A bone helps the first teeth to come through and then helps to get rid of them when the permanent ones begin to force their way up.

Photograph by C. Reid, Wishaw, N.B.

FOXHOUND PUPPIES.

The Poultry Yard.

Most people give their poultry at some time or other one of the many spices that are advertised as likely to make them lay well, but in too many cases this spicing of the food is overdone and a large proportion of the diseases to which our domesticated poultry are subject in this country are due to disorganisation of the liver brought about in two ways—one by feeding on over-stimulating spiced foods, and the other by giving too much starchy food, such as maize. There is no doubt that during the moult, when fowls are ragged and bare, and also during cold snowy weather, a little spice acting as a tonic to the organs of digestion improves matters, but whatever spice is given it should never contain Cayenne pepper. That is the spice generally used, and it is the worst possible thing that poultry can have, for it does not warm them, it merely sets up internal irritation and retards rather than promotes laying. A little saccharated carbonate of iron added to the soft food will do far more towards filling the egg basket than any amount of spice.



Photograph by C. Reid, Wishaw, N.B.

BROWN LEGHORNS.

Early hatched pullets ought now to be starting to lay—especially those which belong to the Leghorn breed or to one of the other varieties which mature very rapidly. When a pullet is thinking about laying she "springs her comb"—as is the technical way of expressing the rapid shooting out of the comb noticed in the long-combed varieties. Pullets which can be brought on to lay now will continue to do so steadily through the winter provided they are kept warm—by which I mean kept in sheltered places, not in pens through which the cold winds can sweep unchecked. A little fibrine meat or a little crushed bone—ordinary household bones smashed up—will help to make them lay well. Young pullets never lay very large eggs—their first "clutch" generally averages a size not much larger than a pigeon's egg. The largest eggs are produced by hens in their third season, but the second season is considered the most profitable because then they lay the largest number of eggs and these always average a good size. Pullets which show signs of beginning to lay should now be removed from older birds that are still moulting and from any young stock which may be left, so that each lot can be fed and attended to separately in the interests of all.

W. M. Freeman.

[N.B.—Photographs intended for these columns should be addressed to "The Editor, Animal Life, 31, Paternoster Row, E.C."]

NOTES AND COMMENTS.

Caught in the act.

THE photograph on this page is of a somewhat unusual catch, or rather take. The young codling here shown was caught in this position in the nets, and Mr. Thiele, who happened to be present, secured the photograph reproduced here.

The Spider and the Moth.

MR. J. C. NOSWORTHY, of Bristol, has sent us the following for publication. He writes :—

"Some years ago while passing under a dry railway arch in Devonshire, my attention was attracted by the strange appearance and unusual movements of a large moth. On looking more closely I saw that it was attached to the side wall by a silken thread three or four feet long, which allowed it to flutter to and fro in segments of a circle. Presently, on coming close to the wall it settled for an instant, and then to my surprise I observed an immense spider perched on its back. The moth soon fluttered away again, fruitlessly endeavouring to escape. The spider still held on to its back and was evidently gradually winding in the thread, as the moth's flights became rapidly more circumscribed, till finally it was compelled to settle on the wall. The spider instantly sprang off its back and, making fast one end of a thread to its victim, ran a few feet up the wall and disappeared behind a projecting stone, where I suppose it made fast the other end. In a second or two it returned and commenced busily enveloping the now almost motionless moth in a silken net. This done, it again ran up the wall to its lair and immediately began drawing up the moth with incredible rapidity to its hiding place. I can truly say I almost shuddered as I pictured to myself the horrid orgie so soon to take place.

"Of what species the spider was I cannot say, but the moth (unless my memory deceives me) was an Oak-Eggar.

"Having never, during more than 50 years' close observation of nature, witnessed such another episode, I am anxious to know if any of your readers have seen anything of the kind or if spiders are known to capture their prey thus. For my own part I have always considered it a most remarkable instance of intelligence and readiness of resource of these interesting creatures. Doubtless, after making fast one end of a thread to the wall, it had sprang on to the back of the moth which had immediately flown off. The spider, finding itself in such a novel and unexpected situation, seems not to have 'lost its head,' but actually to have played its victim as an expert angler plays a big fish, by letting the line run out till the moth became exhausted, and thus gradually winding it in till the prey was safely landed."

YOUNG CODLING SWALLOWING WHITEBAIT.

From America.

THE picture on this page is from an instantaneous photograph by Mr. N. Lazarnick, of New York, and shows an elephant walking on its hind legs. This is said to be the only elephant that can do this. It is a little difficult to see what object is achieved by such a feat as this; an elephant may be one of the most intelligent animals, but the fact that it can stand or walk on its hind legs does not prove or disprove anything, and it is not likely to be of any particular service to anyone. Moreover, it probably has the disadvantage of being very uncomfortable to the elephant that does it.

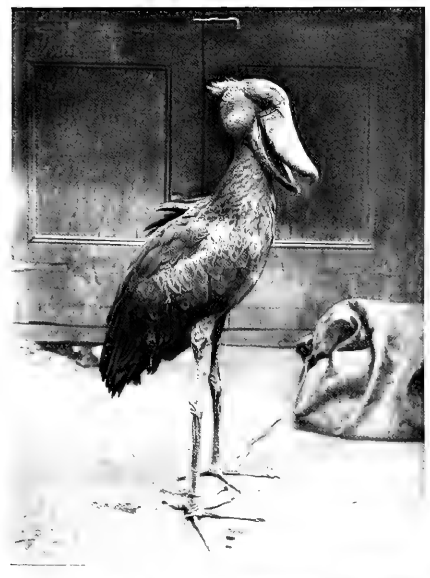
A PERFORMING ELEPHANT.
The only one that can walk on its hind legs.

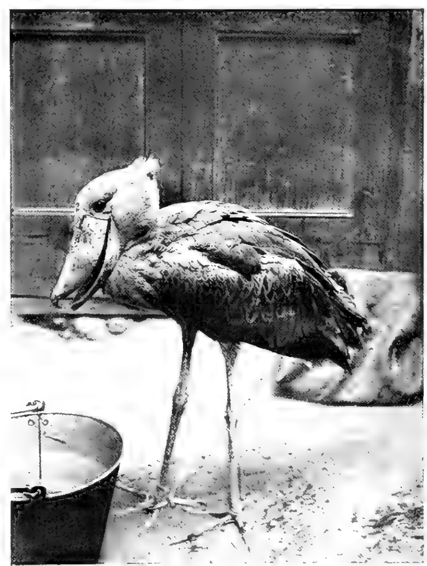
A Stillborn Elephant at the Zoo.

WHILE on the subject of elephants, a very interesting "occurrence," as the authorities term it, has lately taken place at the Zoological Gardens. This was the birth of an elephant calf, though unfortunately it was born dead. The dam, an Indian elephant belonging to Mr. Sanger of circus fame, had been deposited at the Gardens for over a year in anticipation of the event which took place on the last day of August. Much interest was taken in the animal, as it was the first time a captive elephant had been known to breed in Regents Park, and had the calf lived, some useful information might have been obtained with regard to the up-bringing of these huge mammals. When taken to the Society's mortuary the calf, a female, was measured, and it was found that from the tip of the tail to the end of the trunk she was 95 inches long, the trunk itself being about 21 inches. The height at the shoulders was 35 inches. The molars of the lower jaw could be felt beneath the gum but not seen. No record was taken of her weight, but of one born in Philadelphia over twenty years ago it is said the scale was turned at 213 lb.

Rara Avis.

THE four photographs on the next page represent the rare and interesting bird known as *Balæniceps rex*, commonly called the Whale-headed or Shoe-billed Stork, (in Arabic, *Alu markub*, "father of a shoe"); they were taken by Mr. W. L. Loat from a live specimen brought down from the Bahr-el-Ghazel, about 250 miles south-west of Fashoda, in April of the present year. This bird, with two others from the same district, is at present living in the Zoological Gardens at Cairo. The general colouration is a dull grey, the flight feathers and the centre portion of those of the back being dark bluish grey, the irides pale golden, and the bill a dull leaden colour. The feathers of the head are very soft in texture and formed into a little curled tuft at the back, which comes out very well in one of





FOUR PHOTOGRAPHS OF A WHALE-HEADED STORK.

(Balæniceps rex.)

A rare bird that has seldom been seen alive in Europe.

Copyright ANIMAL LIFE.

"CHELSWORTH MYALL."
Mrs. H. C. Brooke's Tame Dingo.

the photographs. It was fairly tame, and eagerly gulped down the portions of fish with which it was fed, also much enjoyed having water splashed over it from a bucket. Fish is the main, if not exclusive diet of this bird, and not mollusca, as was surmised by Sir Samuel Baker, who saw it once or twice when going through the Sudd. The exact geographical distribution of *Balæniceps* is still somewhat uncertain, though the Sudd in the district of latitude 9 degrees N. seems to be its home, especially up to Bahr-el-Ghazel, at a place called Lake Ambadi. A few specimens have been seen on the Bahr-el-Gebel, which joins the White Nile at the east end of Lake Tro. This species was first brought to Europe by Mr. Mansfield Parkyns about the year 1851, and except for two living examples brought over to England by the late Mr. Petherick in 1860, and exhibited in the Zoological Gardens, this rare bird has never been seen alive in Europe. We are indebted to Mr. Loat for the above information, as well as for the interesting photographs of the bird.

The Australian Dingo.

ONE of the most beautiful of all canines, in colour and shape, and certainly one of the most intelligent, is the dingo of Australia. "Chelsworth Myall," whose portrait we give, is a first-class specimen and has won a good many prizes for his owner, Mrs. Brooke, who bred him, his sire and dam being both imported specimens. Nothing will ever persuade him to make friends with strangers; as a personal guard and watch-dog he is unequalled. In the wild state the dingo, like the wolf, is unable to bark, but when kept or reared near domestic dogs they often acquire this accomplishment, and their owner considers them then far more reliable than domestic dogs, as their senses are keener and they never cry "wolf" and bark at nothing, merely to hear themselves, as so many dogs do. Could the dingo be thoroughly trained as a sporting dog he should be invaluable, since naturally, as in all wild animals, his powers of hunting are excellent. The female dingo now at the Zoological Gardens is litter sister to this specimen.

A Lucky Brood.

MR. W. J. JESSIE writes from Mapledurham: "On 7th August, after several days of heavy rain, which was still falling, a brood of five recently hatched partridges and three eggs which he had picked up were shown me by the coachman; the eggs were all wet and cold, but the coachman wrapped them up in a piece of flannel and put them in a warm oven. After about two hours we looked at them; one had hatched out and the remaining eggs were chipped, and in four more hours' time the other two eggs were hatched; all eight birds are now quite strong."

From a photograph from life by R. B. LODGE, ENFIELD.

KITTIWAKE (*Rissa tridactyla*) AT HER NEST.

Photograph by C. Reid, Wishaw.

A FLIGHT OF GULLS.

BRITISH GULLS.

By Aubyn Trevor-Battye, M.A., F.L.S., etc.

NO group of birds taken as a whole is more easily recognisable, both by structure and habits, than the family of Gulls (*Laridæ*). This family has been divided by ornithologists into three sub-families—the Terns or Sea-swallows (*Sterninæ*), the Gulls (*Larinæ*), and the Skuas or Robber gulls (*Stercorariinæ*). Of these, the terns and skuas—since they would in justice require a separate article—are here omitted altogether; and we will consider only the gulls (*Larinæ*). We need not here concern ourselves to take the gulls in the order of their genera; indeed, perhaps a clearer way (in a popular article) will be to group them quite unscientifically, according to their distribution at nesting time—as arctic and non-arctic gulls.

We may begin with the most beautiful of all the gulls and the most northerly, Ross's or the Wedge-tailed gull (*Rodostethia rosea*). This is a true arctic gull, so much so that up to the present moment, so far as we know, its eggs have never been taken by man. Even Dr. Nansen, though evidently close to its breeding place, never got its eggs. It is an exceedingly rare wanderer to these latitudes, and then only in winter, when its plumage is comparatively tame. In its summer dress it has a black collar, and its breast is tinted with rose. Sir James Clark Ross, the great explorer, discovered it first away up in Smith's Sound, in 1823, when he was serving on one of Parry's arctic expeditions.

In the Ivory gull (*Pagophila eburnea*) we have another truly arctic gull, and one which has visited us far more frequently than the first. The plumage of an adult ivory gull in summer is entirely white, while its legs and feet are jet black. I have seen a good deal of these birds in the arctic regions and consider it one of the most strikingly beautiful of birds on the wing. Its flight is tern-like rather than gull-like, and it has the tern's pretty habit of hovering for some moments together over a given spot, with its eye on the fish below. Brilliantly white in the sunlight, the ivory gulls seem like an emanation from the icebergs about which they go. Lovely as they are to look at, they are, however, no more fastidious in their feeling than their more sombre allies; and

the odorous remains of a dead whale is among the least offensive things on which they feed. This bird ranges right round the pole.

A third arctic gull is the Iceland gull (*Larus leucopterus*), which may be fairly described as a small edition of the bird which follows. As I am not myself familiar with the bird, excepting in collections, I will here only say that Mr. Howard Saunders tells us that its summer home is Greenland and the arctic regions of America, but not in Iceland; that in winter time it is to be found about Norway and in the North Sea, where, no doubt, I have overlooked it. Only by long practice of observation can one learn to determine with certainty the species of some particular birds when on the wing.

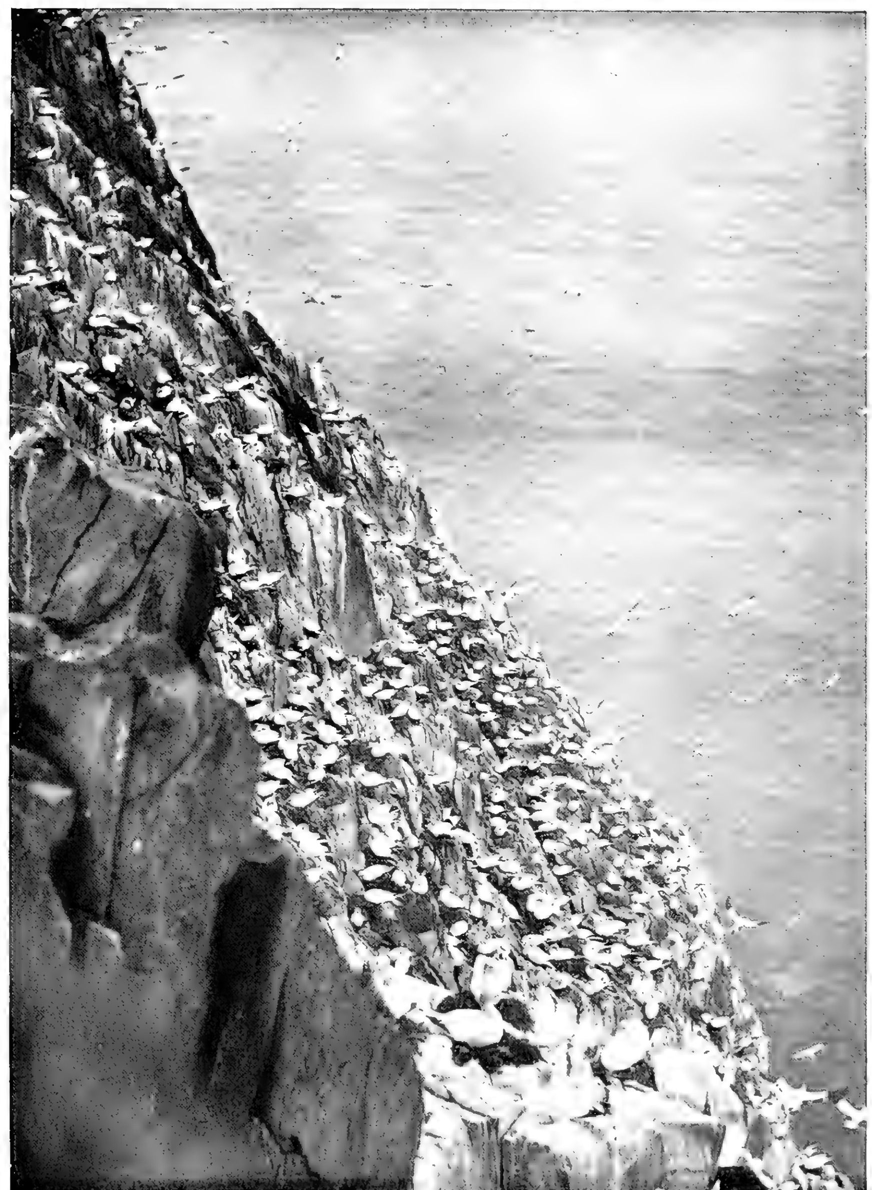
It is possible to determine by their voices and their flight the species of several of the flocked finches when flying; no one who made any pretence to being an observer could mistake a distant flight (or "stand") of peewits for a flight of rooks, a ring-dove for a stock-dove, or either for a blue-rock pigeon. Again, when once the difference has been understood, it is as easy to tell a crow from a rook as a rook from a jackdaw. And so with the sea-gulls. The Brown-headed Gull and the Kittiwake, the Lesser Black-backed and the Herring Gull, the Great Black-backed, the Common, the Glaucous Gull—all these are easily separable one from the other even at some little distance. It is possible also to make a pretty shrewd guess at some of them even in their immature plumage. But the Iceland gull—a pale version of the herring gull—must easily be mistaken for that bird unless there be some difference in manner of flight; and this I do not know.

Photograph by] GANNETS. [*C. Reid, Wishaw.*

The fourth and last arctic gull is the Glaucous Gull (*Larus glaucus*), the "burgomaster" of whaling men and the big bully of the arctic generally. Over thirty inches in length, some three feet six inches from point to point of wings, pure white except for its pale lavender mantle, pink legged, orange and yellow billed, the adult male is a very brave figure of a bird. Bold and rapacious, devouring the young of other gulls, dispatching and tearing to pieces the sick or weakly, it is daunted by few things, even little by the sound of a gun. In Wijde Bay, North Spitsbergen, I shot a little auk (*Mergulus alle*) from a boat's side, when there pounced down instantly upon it a glaucous gull—paying the penalty with its life—so instantly that the two birds fell to a "right and left." This great gull is found in both hemispheres; it is a circumpolar bird. It makes a very large nest built up of seaweeds and hydrozoa placed, in a rocky district, on the cliffs, in a flat district, on the shore. On the sand-banks of Kolguev Island you may see the nests of the glaucous gulls when a mile and more away; for they are there built up to some two and a-half feet high, and magnified by the mirage show up like martello towers along the ridge. So strong and fierce is the burgomaster that in the arctic he has but one rival, and of that one he is afraid.

All these gulls, then, visit us from the north; we now come to some which, though in some instances their nesting ground may extend beyond the Arctic Circle, are not "arctic" gulls.

There is a group of gulls known as "hooded" gulls from their heads being dark—in most cases black—in summer. One is the Little Gull (*Larus minutus*), whose



Photograph by ***J.*** *Reid, Wishaw.*

GANNETS NESTING ON THE BASS ROCK.

This picture and some of the others which illustrate this article are given because they convey an excellent idea of the appearance of a rock at sea in nesting-time. Nearly all the birds, however, are Gannets (birds allied to the Cormorants).

hood is black, legs and feet vermilion, and wings black underneath. This last peculiarity is very remarkable and characteristic. It has visited Britain from time to time, and is known to nest in Northern Russia. The Mediterranean or Adriatic Black-headed Gull (*L. melanocephalus*) is familiar enough to voyagers in the Mediterranean, and nests on the islets at the mouth of the Guadalquivir. It is as a visitor just on the British list, and that is all. The next member of the group, the Great Black-headed Gull (*L. ichthyaëtus*), had up to 1889 only been once recorded in Britain. I have never seen this bird alive, to my knowledge (I have never been in the Levant, where its chief home is); but it is a big bird, nineteen inches in length. So we come to the Brown-headed Gull (*L. ridibundus*), sometimes from its voice called the Laughing Gull. Both in summer and winter this gull is with us, and Londoners know it well. The breasts of several gulls, which are not strictly "roseate," like Ross's Gull, have a tendency towards that colour, and the breast of the Laughing Gull is rose-tinted in the nesting season. It is indeed a lovely little gull. In the summer its head is dark chocolate-coloured, its back a blue-grey, its wings white and black, its tail white, its breast blush-white, its bill, legs, and feet brilliant flamingo-red. In winter it loses some of these striking points. Unfortunately in its winter dress it comes to London; its hood gone, or reduced to a simple eye-spot, its legs and bill less bright—in colour it is then very different from the summer bird. I think it was the tremendous winter of 1896 which brought these birds to shelter in the Thames—the Thames which that winter was packed with ice-floes like an arctic sea. They have come every autumn since, and seem to come in increasing numbers, contesting every bit of bun or bread with the wild-fowl about the bridge in St. James's Park.

Photograph by] HERRING GULLS FLYING. [*C. Reid, Wishaw.*

This little gull does not breed on cliffs or uplands, like most other gulls. It nests on marshes or quite inland on pieces of fresh water. Here it makes a nest of reeds or flags, which rests upon the rushes or bog-bean or any other flat vegetation. I have visited several of these gulleries, and it is a most beautiful sight to see the white birds rise in hundreds and drift about the reed-beds like thick-driving snow. In Northumberland is one small breeding place—Pallinsburn; others are in fresh water hollows on the remarkable series of old beaches at Dungeness; but perhaps the most celebrated is the gullery of Scoulton Mere in Norfolk. A regular trade is done in the brown-headed gulls' eggs there. Something like two thousand are taken there in the week. One very hot dry summer the gulls there took to catching field-mice—mostly, I fancy, bank voles. They brought them in to their nestlings, and I saw them drop them from a height on to the ground to kill them, much as you may see the grey crows dropping mussels to crack their shells.

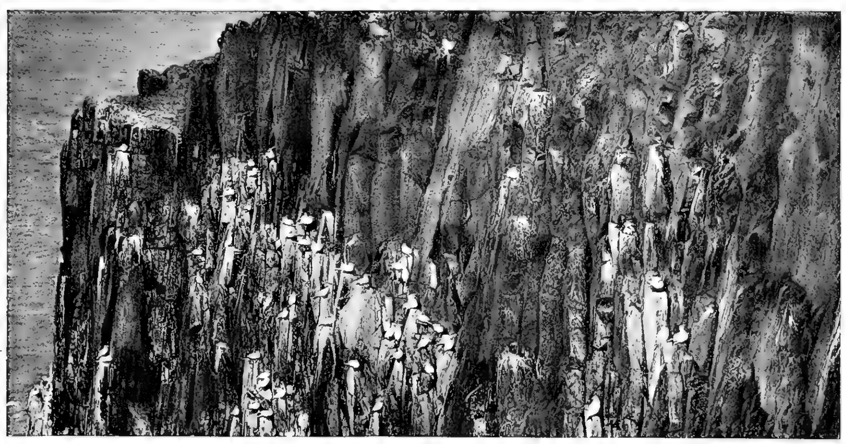
We come now to the Common Gull (*L. canus*), common only in winter. Then you may see them anywhere round the coast, and see them following the plough. Often they fly for this purpose very far inland, and return to sea in the V-shaped

formation of a skein of geese. They breed in the north of Scotland on the grass by the sides of lochs. Their plumage in summer is pure white, excepting for the black-tipped wings and the blue-grey of the back. I saw many common gulls associating with the kittiwakes on the Blackwater River when fishing in Ireland this year.

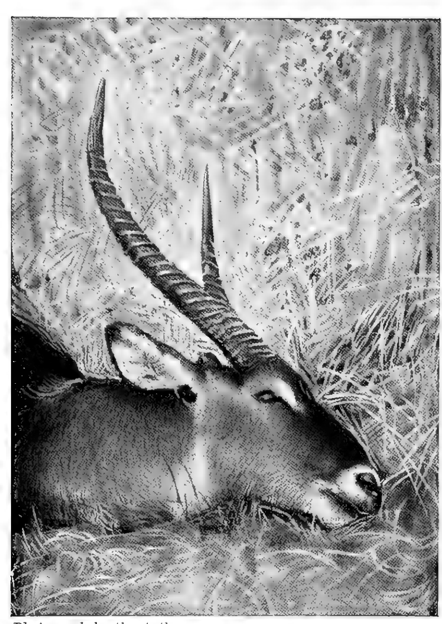
The Kittiwake (*L. tridactyla*), which we will take next, seems to be a favourite with everybody. As far as Britain is concerned this little gull is found everywhere, and is one of the most companionable of birds on the high seas. The kittiwakes come with you, flying round the steamer, and with the greatest ease keeping up with the vessel's speed. As may be seen from the coloured plate, they are cliff-breeding gulls. They nest colonially, often in immense numbers together. There are large colonies of them in Ireland and on Lundy Island. In the Farne Islands they nest in the entrance to caves and in the passages between the rocks, sometimes so low down that you can put your hand into a nest. The most immense colonies of kittiwakes I have ever myself seen are in Spitsbergen, and also near the North Cape of Norway. The effect of firing a shot under these gulleries is surprising. The kittiwakes leave their nests in myriads, a dense cloud of waving wings and screaming throats.

The Great Black-backed Gull (*L. marinus*), familiar to us all in our own seas, is certainly one of the grandest birds that fly. Almost as large as the glaucous gull, and rapacious to a degree, it is a terrible foe to any sickly or wounded creature it may come across. In the Hebrides, where it nests, I have seen this bird quartering the high moors with great regularity, apparently looking for wounded grouse or hares. The legs of this bird are pink in colour, in contradistinction to those of the Lesser Black-backed (*L. fuscus*), which are coloured yellow. It measures over three feet across the wings.

The last of the gulls to which we shall refer is the Herring Gull (*L. argentatus*). It is found all about our seas, and nests on cliffs and stacks of rocks all round the coast. It goes inland, too, and hunts for earthworms, and picks up the corn when freshly sown. With us it has flesh-coloured legs, but in arctic Russia, and eastwards thence, its legs are yellow and its back a dark slate-black, and there the monks of the White Sea Islands make of it a sacred bird. The Archimandrite allowed me as a great favour to bring back one alive to England some years ago, and this bird lived in a Northumberland garden for several years, and for all I know to the contrary may be living there now.



GANNETS.



Photograph by the Author.
HEAD OF WATERBUCK (*Cobus defassa*).

WILD BEASTS AND THEIR WAYS.

A series of articles on popular Zoology.

By Sir Harry Johnston, G.C.M.G.

III.—ANTELOPES (PART II.)

Illustrated with original drawings, paintings, and photographs by the Author and others.

TO conclude my review of the Gazelles: the swelling of the nasal cartilage exists laterally in another remarkable aberrant gazelle—the Chiru (*Pantholops*). The *Pantholops* is an inhabitant of Tibet. It is of considerable size and more typically gazelline in build than the Saiga, to which it is, however, most nearly related. The horns, present only in the male, are very long (often over two feet in length). They rise very nearly uprightly from above the orbits, but have a graceful backwards and forwards sweep. The hair is thick and woolly, as is natural to its habitat (the extremely cold Tibetan plateaux). There are something like the gazelline dark markings on the face and the outer edges of the limbs. The sides of the nose and muzzle are very swollen and inflated.

The Chiru is also in all probability allied in origin to another isolated and aberrant type—the Blackbuck or Indian Antelope (*Antilope*), the scientific name of which, a Greek word, is the origin of the term antelope. In this animal the gazelline markings about the face have run together, so to speak, till the whole of the face is black (in the males) or brown (in the females), leaving a large white circle round the eyes, ears, and muzzle. The neck and upper parts of the body and outer aspects of the limbs are black and brownish yellow in the male and golden-brown in the female, leaving the lower part of the throat, brisket, belly, rump, and under sides of the limbs snowy white. The most extraordinary feature, however, in the blackbuck is its long and twisted horns (in the male only). Occasionally the female Indian antelope or the castrated male grows horns of an abnormal and no doubt more primitive type. These sometimes curve downwards like a ram's, and are but slightly spiral. On the whole it would seem as though in its horns the blackbuck is most nearly allied to the chiru. Its horns early in their evolution grew no doubt to great length and then assumed a spiral form—a tendency which crops out again in the goats and sheep, in one of the Orygine antelopes, and in the very distinct sub-family of the tragelaphs. The horns of the Indian antelope, like those of the saiga, are also remarkable from the fact that they are ringed almost to their tips. Nearly all other antelopes have a smooth space towards the ends of the horns.

Allusion has already been made to the *Bahra* antelope (*Dorcotragus*) of Somaliland as being a somewhat puzzling type which may perhaps be classed as an offshoot from the gazelles at an earlier stage of their descent. The coloration of the face recalls the Indian

antelope. The ears are white, very large and broad. The upper part of the face across the eyes is broad as compared to the pinched muzzle and nose. The animal in standing poises itself on the edges of the short, rounded hoofs, recalling a similar peculiarity in the klipspringer. The structure of the face-bones suggests affinity with the dik-diks, and the horns are erect, straight, and not very long, like those of the steinboks (*Raphicerus*).

We now come to the consideration of a somewhat isolated type of antelope of puzzling affinities—the Pallah (*Æpyceros*). This beautiful creature, which is found in two forms all over the southern half of Africa, from the Egyptian Sudan and Lake Chad regions to South Africa, bears, in the male only, horns which rising almost perpendicularly from the top of the skull bend boldly backwards and then curve upwards once more towards the tips. The horns are remarkable for the exaggerated bosses or rings which, with the exception perhaps of certain goats, are more ruggedly developed in the pallah than in any other antelope. In its horns the pallah offers a strong resemblance to the Bubaline group; indeed, judging from horns alone (as will be seen by my illustration "Heads and Horns"),* the bubalines might well be derived from some pallah-like type, passing through such intermediate forms as Hunter's Topi and Swayne's Hartebeest (which again in its horns shows affinities to the Gnus). The pallah has lost the false hoofs which are present in the bubalines, and the anteorbital glands ("tear-bags"), which, though small, nevertheless exist in the hartebeests and gnus, and it has only *two mammæ*, whereas *four mammæ* are present in the gnus, and must therefore have been in existence in the primitive bubaline stock. It would be quite possible to derive the pallah from a Cervicaprine type. The present writer is inclined to dispute its near connection with the Gazelles, and to place it in a group by itself as the modified descendant of some development of cervicaprine antelope, which in other directions gave rise to the gnus and hartebeests.

MRS. GRAY'S WATERBUCK.

Drawing by Author.

The Cervicaprines are a group of antelopes wholly African in its distribution at the present day. They include—if one is to leave out the pallah—the Reedbucks and Waterbucks, the three genera *Pelea*, *Cervicapra*, and *Cobus*. The Cervicaprines may well have arisen from some primitive Neotragine or Cephalophine type which retained its gall-bladder, four *mammæ*, a long tail, and false hoofs. Curiously enough, however, the whole group of Cervicaprines, like the pallah, has lost entirely the anteorbital glands or "tear-bag," which is a characteristic of so many antelopes and deer. This to a certain extent militates against their being the basal stock from which the hartebeests have descended; though, of course, it is always possible that some lateral form of Cervicaprine may have continued to retain these glands and have been the parent form alike of the pallah and the bubalines. It would be, for instance, very interesting if a further examination of the Rhebok (*Pelea*) of South Africa revealed any traces of anteorbital glands, as with its very naked muzzle and its nearly straight (though slightly recurved) horns, the rhebok suggests marked resemblances to the Oribis

* This will appear with Part III. in the next number of ANIMAL LIFE.

and True Duikers. In no species of the Cervicaprines are horns developed in the female. There is a great range of variation in type amongst the horns of the male, from the simple, nearly straight, and vertical horns of the rhebok (*Pelea*) (which animal, by-the-bye, is confined in its distribution to Africa south of the Zambezi), to the long, splendidly-curved, backward-directed and almost hippotragine horns of Mrs. Gray's Waterbuck (*Cobus maria*). In the reedbucks (*Cervicapra*) there is a completely concave curve of the horns, the tips being directed sharply forwards. In the typical "Waterbucks" of the genus *Cobus* (such as *Cobus singsing*, *C. ellipsiprymnus*, *C. defassa*, etc.) the horns (as may be seen in my illustration) are long and sweeping and somewhat widely spread at their points, but still have a concave curve. In the smaller species of Cobus, of which *C. thomasi* is a good example, the horns rise more vertically and with greater convexity above the orbits, and their curve is more graceful and lyrate. This development attains such an extreme form in *Cobus maria* that the horns have but little recurvature at the tips, and are almost hippotragine in outline. At the same time in *Cobus maria*, and in the smaller but allied *Cobus leucotis*, the outline of the face begins to resemble the Orygine group, while its coloration offers a distinct approximation to the face-markings so characteristic of the Sable, Roan, and most of the Oryx antelopes. In many of the larger Cobus antelopes there is a somewhat heavy growth of hair along the lower part of the neck which recalls the same appearance in the sable, roan, and addax antelopes. In all the larger Cobus antelopes the tail is long and tufted,* the ears also tend to become long and to have black tips. The false hoofs are well developed, and there are four *mammæ*. The large waterbucks, like *Cobus ellipsiprymnus*, *C. singsing* (West Africa), *C. penricei* (Angola), *C. crawshayi* (Tanganyika), are exceedingly hairy, especially in the female. A good example of the extravagant growth of hair about the face of the female waterbuck may be seen in my work on British Central Africa. In *C. defassa* the hair is shorter and less abundant. I have seen examples of this animal on the eastern borders of the Congo Free State, where in the males there was a distinct tendency towards loss of hair, just as one observes in buffaloes. *Cobus defassa* is much redder than the other big waterbucks (which all tend towards a grey coat in the male). The forehead of *C. defassa* is almost vermilion-red in some examples. The smaller Cobuses, of which Thomas's Kob may be taken as an example, have a coat of golden-yellow with dark markings on the limbs and a little white about the face and throat; but a variety of Thomas's Kob is occasionally met with in Uganda with a remarkable "mantle" of whitish-grey over the back and hind quarters. The White-eared Kob of the White Nile is a handsomely-painted animal, with a short coat of rich blackish-brown, variegated with bold white markings about the face, throat, chest, belly, limbs, and feet. Most splendidly marked, however, of this handsome group, and perhaps one of the most beautiful animals in the world, is

Photograph by Author.
HEAD OF THOMAS'S KOB (*C. thomasi*).

* This is particularly the case in *Cobus maria*, where the tail is remarkably oryx-like in appearance.

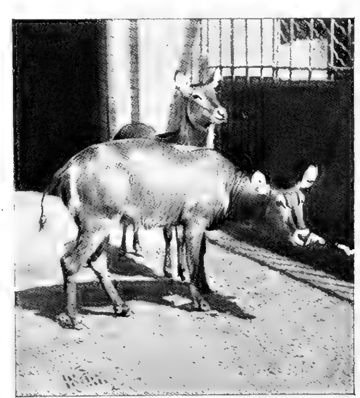
Drawing by Author.
REEDBUCK (*Cervicapra arundinum*).

Mrs. Gray's waterbuck (*Cobus maria*), to which I have already made allusion as being a possible stepping stone between the Cervicaprines and the Oryx group. The greater part of this animal's coat is a warm sepia or chocolate-red, tending here and there to black. The lips, chin, ears, and a long streak between the eyes and forehead are creamy-white. Behind the ears begins a bold white patch at the base of the skull, which narrows into a white line down the ridge of the neck and broadens into a bold patch over the shoulders. There is a broad white line on either side of the spine on the hind quarters which extends to the black tuft at the tip of the tail. There are also bold white markings along the sides of the stomach and the knees.

The reedbucks, which I have already described as having such sharply recurved horns, are by no means so beautiful in coloration, the West and Central African forms being mostly golden-yellow with a little white on the under parts. The Common reedbuck (*Cervicapra arundinum*) inclines rather more towards grey in the male, as does also its dwarf forms in South and East Africa (*C. fulvorufula* and *C. bohor*). In the reedbucks the tail is much shorter than in the kobs. It tends to be very bushy, however. The ears in some of the smaller species are very long, though not of such an extreme length as in the rhebok (*Pelea*). In all the reedbucks (but not in *Pelea*) there is a more or less naked gland below the base of the ear. This gland is also present in some of the waterbucks, as may be seen in one of my photographs. On the whole it would seem as though the reedbucks are to some extent independent variations of the Cervicaprine type which do not lie along the main line of ascent towards the Orygine group.

The Oryxes and the Hippotragines are the handsomest and most notable development of antelope, with the possible exception of Mrs. Gray's waterbuck. What a noble creature, for example, is the South African Gemsbok, with its splendidly bold coloration of black, white, and warm mauve-grey! It is lamentable to think that this fine animal is now not far off extinction, after a century's persecution at the hands of British and Boer sportsmen, a combination which history will subsequently brand as one of the most destructive agencies in the reduction of the African fauna.

The Oryx, Addax, Sable and Roan antelopes and their allies form the sub-family of the *Hippotraginæ*. Of all the other antelopes they are most closely connected with the Cervicaprines, from which they differ only in the following features: the muzzle is hairy and not naked and wet as in the Cervicaprines; the molar teeth are taller, broader, and have developed accessory internal columns; they are therefore more complex than the teeth of the Cervicaprines, and offer a purely accidental resemblance to a similar development in the Oxen, with which group, however, the hippotragine antelopes have no connection. A



Photograph by C. Knight
FEMALES OF WATERBUCK
(*Cobus ellipsiprymnus*).

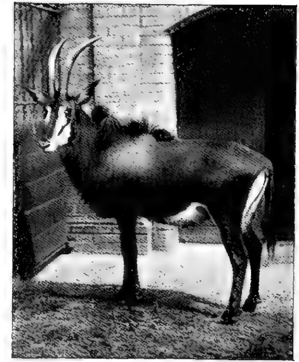
further point in which they differ in development from the cervicaprines is that in three species of *Hippotraginæ* the females bear horns. The horns, which tend to be very long, do not exhibit in any existing form any tendency to a Cervicaprine recurvature at the tips. Like the Cervicaprines, the Oryxes have retained their accessory hoofs, four teats, and a long tail, while they have entirely lost the anteorbital glands.

The most remarkable form of this group—very cervicaprine in appearance—is the now extinct Bluebuck (*Hippotragus leucophæus*). This animal was formerly an inhabitant of Cape Colony, but was successfully exterminated by the Dutch settlers without any aid from British sportsmen at the end of the 18th or beginning of the 19th century. Its coloration was mainly a bluish-grey tending to brown on the upper parts of the body, with a chestnut frontlet that extended some distance down the nose and round the eyes. The horns rose vertically from above the orbits, and then sloped backwards and resembled those of the roan antelope. There is a good deal about the build of the bluebuck and the shape of its horn-cores to suggest affinity with the extinct antelope *Tragoceras*, the fossil remains of which are found in Greece and Asia Minor, and which may have been somewhere near the common stock of the Cervicaprines and Oryxes. The Roan antelope is a splendid beast, with a horse-like mane on the ridge of the neck and a cobus-like mane along the throat. Its face is boldly marked in black and white, and the rest of the body in reddish-grey or chestnut-brown and white. The ears are very long and curved downwards at the tips, which are black. In a West African form of the Roan antelope, as also in one oryx, the ears grow to extravagant lengths, and are shaped like the segment of an orange. The Roan antelope is the most widely distributed of all the hippotragine group, being found in several sub-species in South, Central, West and East Africa, extending, in fact, from the southern borders of the Sahara Desert to (formerly) the vicinity of Cape Colony. The Sable antelope has a more restricted range, extending southwards from the vicinity of Kilimanjaro in East Africa (on the north) through German and Portuguese East Africa, and British Central Africa across the Zambezi to the Transvaal and Zululand. It is found also in the Barotse kingdom. The horns of this antelope have a noble sweep. They are rather broad laterally at their bases and perform a crescent-like, convex curve backwards to their very sharp tips. The horns of the female are less broad at the base, much less curved and more oryx-like in appearance. The sable antelope as a calf is born a yellowish-brown with a small black fringe to its tail, and somewhat vaguely defined white cheeks and lips. If it is a female the white markings over the eyes and the black streak right down the nose and again right over the eyes along the side of the cheeks will become intensified, as will also the white belly and rump; but the rest of the hide may (as in Nyasaland) remain a golden-brown, tending in some old examples towards sepia and even black. But the

Photographs by W. P. Dando.

HORNS OF ADDAX ANTELOPE (Male and Female).

adult male sable antelope is absolutely black and white, the black being of the blackest and the white of the whitest, except perhaps for a slight brown touch about the ears. The sable antelope is a little short in the legs in proportion to the rest of its bulk, nor are the legs as finely shaped as is the case in most pictures of this animal. But for this it would be one of the most perfectly beautiful of living forms.

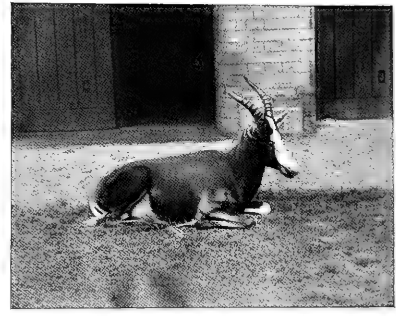


Photograph by W. P. Dando.
SABLE ANTELOPE
(*Hippotragus niger*).

Intermediate to some extent, perhaps, between the Oryxes and the Roan antelopes is the curious Addax, a creature confined in its distribution to the northern half of Africa, to the Sahara Desert, and the more fertile countries on the northern and southern fringes of that waste. The Addax also offers points of resemblance to the Cervicaprines. Its ears do not attain the same extravagant length as is characteristic of the Roan and some oryx antelopes. The orygine markings about the face are reduced to a frontlet of thick black hair over the forehead and bold white marks at the corners of the eyes, extending towards the cheek. The hind quarters, belly, and all four limbs and tail are also white or whitish, the rest of the body being buff or greyish-brown. There is little or no mane along the ridge of the neck, but there is a heavy cobus-like mane along the throat. The horns appear to have once resembled in shape and general direction the horns of the Leucoryx, that is to say, to have grown backwards in a continuous line with the profile, and then to have assumed a convex curve with, perhaps, just the slightest tendency to turn up at the tips. But in course of time the long and slender horns acquired first one spiral twist and then a second, and finally, in adult males at the present day, a third; so that the adult male addax offers a curious resemblance in his horns to the totally distinct Kudu. The Addax, which was once very common in Tunis, Algeria, and Tripoli, was known to the Romans, and is represented (curiously enough with but slightly spiral twists to the horns) in the Roman mosaics and frescoes found in North Africa; yet it appears to have made less impression on the mind of the Afro-Roman artist than the Leucoryx, a creature which is now wholly extinct in fertile North Africa, but which constantly appears in designs of Roman art in Tunisia. The Leucoryx (*Oryx leucoryx*) is an intermediate form between the roan antelope group and the true oryxes. It has a heavily-tufted, cow-like tail, the usual oryx markings in brown and white on the face, white ears of moderate length, a white stomach, and the rest of the body pale buff to reddish-brown in colour. The horns

Photograph by Norman B. Smith, Esq.
BEISA ORYX (*Oryx Beisa*).

are long, and moderately convex in backward curve. This animal was well-known to the Hebrews, Egyptians, and Greeks. Its range of distribution formerly included the greater part of North Africa in addition to the Sahara Desert and Egypt. At the present day it is found in Senegal and along the northern bend of the Niger, in many parts of the Sahara Desert, and the Egyptian Sudan. Its range would appear to extend still northwards across the Sahara Desert to the vicinity of the fertile regions of Tripoli, Tunis, Algeria, and Morocco. It is still reported occasionally to be met with to the south of the dried-up salt lagoons—the region of the Shats—in the interior of Tunis.



Photograph by J. W. McLelan.

BLESBOK ANTELOPE.

In Arabia a closely allied animal is the Beatrix antelope (*Oryx beatrix*). This handsome oryx is nearly pure white in coloration, except the limbs (which are brownish-black, the pasterns being white), the cheeks, the frontlet, and the nose-ridge, which are blackish-brown. The white tail has a heavy brown tuft. The horns are fully as long as those of the leucoryx (say, a little over two feet in length), but are much straighter and with less of a convex curve. The present range of this animal is restricted to the more southern portions of Arabia and the western shores of the Persian Gulf. The noblest development of the oryx is the glorious Gemsbok (*Oryx gazella*) of Africa, south of the Zambezi. In this animal the horns, which as in all other oryxes make no angle whatever with the profile of the nose, but continue along the same straight line, have absolutely no convex curve, are not very broad laterally at their base, and are extremely sharp at the tips. The horns often attain a length of more than forty inches in the male, and, strange to say, an even greater length in the female, in whom, however, they are much slenderer and not always so straight in turn. This animal is almost eccentrically pied in black and white, with a third element of mouse or mauve-grey. The ears of the gemsbok are cobus-like in shape and length, and do not attain the same extravagant length as is the case with the tufted Beisa (*Oryx callotis*) of East Africa. The gemsbok is also remarkable for a black tuft of hair on the under part of the throat in the male, which is perhaps all that remains of the cobus throat-mane; the tail also is heavily tufted. It is not, however, much use describing this handsome beast, because, at the time of writing, it is very scarce and not far off extinction. It is difficult for the British authorities in Southern Africa to enforce in the far interior the regulations for the preservation of large game. Our only hope for the retention on this earth

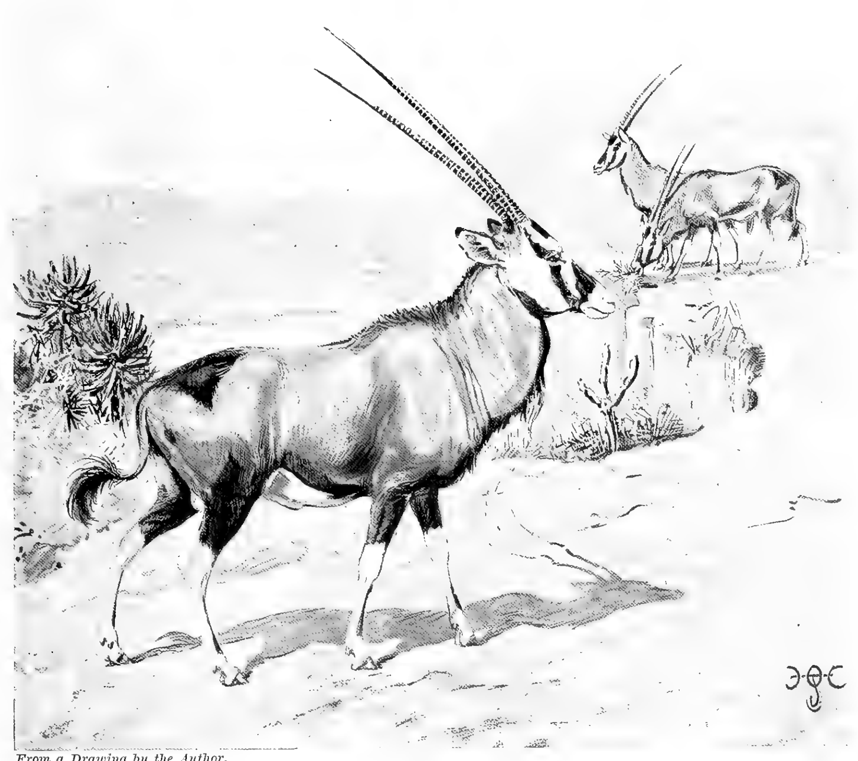
Photograph by W. P. Dando.

CAPE HARTEBEEST

(*Bubalis caama*).

of the most beautiful of the oryx group lies in the fact that some of these animals still linger in inaccessible parts of Portuguese and German South-West Africa. At one time they were fairly numerous about fifty miles to the south of Mossamedes, where the present writer saw them (and also on the Upper Kunene River) in 1882.

In Eastern Africa (Somaliland north of the Tana River), and in the Egyptian Sudan east of the Nile and west of the Red Sea, the Beisa oryx is found. This form is obviously a more primitive type than the gemsbok. The long, straight horns however, grow closer together at the tips, and the body markings are not nearly so



From a Drawing by the Author.

GEMSBOK (*Oryx gazella*).

bold in their abrupt contrast of black and white. In the photograph on page 171 of the Beisa, it will be seen that the horns have a slight convex curve, more like those of the Leucoryx. The fact is that there is more variation in the shape of the oryx horns than is generally thought, and a constant tendency for them to revert to a more curved condition. In Eastern Africa south of the Tana river and between Lakes Taganyika, Victoria, and the Indian Ocean is found another form of beisa which is remarkable for its long and black-tufted ears which recall those of the roan antelopes.

(To be continued.)

HE KNOWS HIS FIGURES—

AND A LITTLE ZOOLOGY.

A THOUGHT-READING DOG.

Illustrated with Photographs taken especially for this Magazine.

"BOB," the hero of this little article, is no longer in his first youth, being nine years old. He shows, however, no signs of advancing age, and is as keen a sportsman as ever. No sport comes amiss to him. He once unearthed a stoat, digging it out of a deep hole in which it was reposing surrounded by a colony of snails, on which it intended, presumably, to make a meal. It had, however, reckoned without its host. One nip from "Bob's" sharp teeth—a faint squeak from the unlucky stoat—and all was over. He is equally expert as a mole-catcher, and while running after a carriage in Brittany, where they abound, lagged behind for a moment, then came racing along and caught up to it with a mole in his mouth. He becomes quite wild at the sight of a hedgehog, and, alas! does not hesitate to kill one when he sees it, and that, moreover, without drawing a drop of his own blood.

"Bob" came into his present owner's possession when a puppy of a year old. His original master, who was also his breeder, was obliged to part with him as, notwithstanding his youth, he tyrannised unmercifully over the other two dogs, who stood to him in the relation of father and brother. From the very beginning he gave proof of marked intelligence, learning first easy then more difficult tricks with surprising rapidity; while his retentive memory enabled him to recollect anything he had been shown, if only once, even after the lapse of weeks. The first trick of any consequence he learned was to pick out cards. This he was taught by laying one down, placing upon it a bit of biscuit, and then calling out its name. He thus learned to connect the one with the other; but he soon picked out the cards without any reward until after the trick was done. The next stage in his education was to teach him the alphabet; he learned to spell some short words, as well as his own and his owner's name, going afterwards to their photographs. Notes of music followed, in which he could distinguish even the slight difference which exists between the crotchet and the quaver. He has become equally an adept in coins. When a peseta, franc, and shilling, with the heads of the young King of Spain, of the Emperor Napoleon, and of Queen Victoria, are laid down before him with the heads uppermost, he points to each one as it is called out, making no mistake, even when their places are changed. He can also discriminate between a Belgian, Swiss, Greek, and French 50c. piece, and, from amongst them, pick out an English sixpence.

He knows his multiplication table, and can also add together any combination of four figures, such as three times ten and two—further he has not been tried. Within the last few years he has made great strides. Whereas he formerly, after seeing it only once, learned anything new, he now, wonderful to relate, never requires to be taught anything. For instance, photographs of our distinguished Generals are stood upon the floor, a question concerning one of them is asked, on the spur of the moment, by any one present. This question, such as "Who defended Mafeking?" or "Which are the V.C.'s?" is then repeated to "Bob" by his owner. He immediately, without having ever been taught it, puts down either his head or his paw on the photograph in question. As to the progress he has made in his spelling—the letters composing the Christian or surname of a visitor (or any other short word) are mixed up together. He is told to spell the word, of generally six or seven letters—without even hearing it—and this feat he accomplishes successfully. Or again cards, with the names of European capitals, or of countries, India, China, etc., are brought forward in the same manner, and he answers any questions put to him concerning them. On one occasion he was asked, "Where are the Boxers?" when he at once went to China. "Where is Lord Curzon?"—to India—and so on, *ad libitum*. The question now arises—Is it possible for a dog to do such things? and some who have seen "Bob" vote him "uncanny." His owner has come gradually to the conclusion that the only possible explanation is—thought-transference. This seems to be further carried out by the fact that he does his *tours de force*—to call them tricks would be an insult—equally well when not a syllable is uttered. His owner, while keeping the eyes fixed steadily upon him, merely repeats mentally what he is required to do, and the result is the same. Some letters from Mr. Edmond Selous on the subject of thought-transference amongst birds appeared last autumn in the "Guardian," but we are not aware of any similar instances (as the above-mentioned) of mental telepathy between a dog and its master. Strangers who have not seen for themselves invariably smile incredulously when told these wonders; indeed so extraordinary did such a performance seem that a representative of ANIMAL LIFE paid a special visit to the West of England this summer in order to see for himself, and "Bob" gave a séance exactly as recorded above, with the addition that when asked which animal most resembled the "Okapi," went at once to a picture of the zebra, picking this out from among others of the tiger, lion, ostrich, and elephant.

SALUTING LORD KITCHENER.*

DYING FOR THE KING.

* A copy of this photograph was presented to and accepted by Lord Kitchener at Ballater Station, on the nineteenth of September, of this year (1902), after his visit to the King.

THE CARE OF DOMESTICATED ANIMALS.

By W. M. Freeman.

Photograph by J. Peat Millar, Beith.

A TAME COCK ROBIN.

The Aviary.

Many bird lovers are fond of keeping talking birds, these being the magpie, the jackdaw, the jay, and the starling, which last-named little fellow is one of the most interesting of all birds to keep. It is worthy of note that all these birds are carnivorous and insectivorous in their diet, although none of them particularly object to anything edible that comes in their way. The starling is very widely kept as a pet, but a great many of them die in the hands of inexperienced people for want of more of the kinds of food they get in their wild state. Finely-chopped fresh meat is one of the best foods for a starling together with worms, beetles, and any other insects that are obtainable. They do not as a rule live very long in small cages, but in a large roomy out-door aviary where they can have plenty of exercise they will thrive very well.

During the moulting season, which is not yet over, all aviary birds need a little extra attention in the direction of stimulating food. Hemp seed can now be given liberally with good results, whereas it should only be given in very limited quantities (if at all) at other times. A little syrup of hypophosphites added to the water will be a safe and useful tonic, helping out the new feathers. The aviary during moulting time will require to be kept even more scrupulously clean than at other times on account of the number of old feathers littering the floor. Protection from cold winds should be arranged without interfering with the complete open-air system of ventilation which ought to prevail in every aviary. Do not neglect, now in particular, the grit boxes. Every aviary ought to have a little box or other receptacle set

Photograph by Hutchinson & Co.

THE BEST WAY TO KEEP RABBITS.

Snapshot of young rabbits at the mouth of an artificial "bury" in a large tomatoe "frame."

apart for the supply of grit of suitable size according to the birds that are kept. The best grit is a mixture of flint and crushed limestone, and it is far better to provide this in a receptacle to which the birds can have access when Nature tells them they require it than to scatter it all about the floor. Aviary floors should of course be nicely sanded, but sand is not the sort of *grit* that birds want.

The Rabbitry.

Rabbits are liable to one particular disease known as "snuffles," which corresponds to "distemper" in dogs, "influenza" in cats, and "roup" in poultry. Some authorities consider that these are one and the same disease taking different forms in these various animals, but whether that be so or not it is certain that "snuffles" is a veritable scourge amongst pet rabbits. It is a catarrhal affection, the rabbit constantly sneezing and having a running at the nostrils. Accompanying this there are often feverish symptoms, the animal being very thirsty and refusing its food, with the result that in a short time it becomes reduced in condition and is likely to die. There is no doubt whatever that it is highly contagious, and, therefore, whenever a rabbit shows signs of a cold it should be isolated from the others, and not be allowed to return to them until the symptoms have disappeared. The best course of treatment for a rabbit with "snuffles" is to sponge its nostrils frequently with warm water to which a few drops of coal tar antiseptic have been added, and for internal medicine give it a little jalap, which a rabbit will readily take if it be mixed up with barley meal into a paste, a few grains of sugar being added to sweeten it. Be sure the animal is kept in a warm but well-ventilated room, and if the attack be very severe let a bronchitis kettle be used, adding a teaspoonful of pure carbolic acid to the water therein before starting it to steam. This often has a wonderful effect upon any animal suffering from bronchial and catarrhal affections.

FOX TERRIER.
"Bob," the thought-reading dog, in mufti.
(See pp. 174-175.)

The Kennel.

Nearly all dogs are liable to skin disease in some form or other, and when a dog suffers from an eruption the generality of people say that he has "the mange." As a matter of fact nineteen cases out of twenty of skin irritation in dogs are not mange at all, but eczema. Eczema is brought about by impurities in the blood as contrasted with mange, which is caused by a parasite burrowing under the skin and setting up a pustular eruption which cannot be mistaken. Mange only occurs in dogs kept under very filthy conditions; dogs well attended to never have it—unless they happen to become infested with parasites by contact with a mangey cur. The treatment for eczema or ordinary skin irritation consists of using a mild lotion made by diluting the "Glycerine of Carbolic Acid" of the British Pharmacopeia to about one-tenth of its ordinary strength with water. This makes a nice clean lotion with which the irritated parts can be sponged; then it can be dried off with a soft towel and the places dressed with a little carbolized vaseline, which will keep the skin soft and allay irritation. Treatment like this morning and night with some alterative medicine will generally effect a cure.

ANIMAL ANECDOTES.

A Life-Saving Dog.

A vessel was driven on the beach of Lydd, in Kent. The sea was very high. Eight men clung to the wreck, which was every moment in danger of going to pieces. No boat could be got off through the storm to help the despairing sailors, and it looked as if they would drown before the eyes of the watchers upon the land.

Presently a gentleman came along the beach accompanied by his Newfoundland dog. The gentleman directed the animal's attention to the vessel, and then put a short stick in his mouth. The dog at once comprehended his master's meaning and plunged into the sea.

Bravely he fought his way through the angry waves, but he could not get close enough to the vessel to deliver that with which he had been charged. The crew, however, understood what was wanted, and making fast a rope to another piece of wood, they threw the wood toward the dog.

Then he started for the shore.

The intelligent animal at once dropped his own piece of wood and seized that which had been thrown to him. Then he started for the shore. Again and again he was lost under the waves, but with almost incredible determination he held on to the stick and dragged the rope through the surf till he delivered it to his master. A line of communication was thus made with the vessel, and every man on board was saved.

Tiger v. Lioness.

We take the following from "The Golden Penny":—"We recently published an extract from Animal Life, describing a duel between a lioness and a donkey. A fight of a somewhat similar character has just caused great sensation in Western Australia. A fine lioness had been suffering from a persistent nervous ailment. It was decided to place a tiger with her for company. At first it seemed as if the animals would agree all right, as they purred and rubbed each other's heads through the bars with great friendliness. But afterwards the lioness began to get snappy, and dealt the tiger some blows that would have broken the head of any other beast, and when she gave him a sharp bite he seized the lioness and bit her through the throat, lacerating the neck in a frightful manner. He dragged her round the cage, and once threw her right over his back. The lioness showed great pluck, and fought with all her strength, but the tiger was her master. Eventually the tiger was induced to drop his antagonist and crawl into an inner cage. The victor bore few marks of the encounter, although he received some terrible blows, each one, according to an eye-witness, sufficient to smash the head of a man. Half an hour after the tiger had been driven off the lioness died."

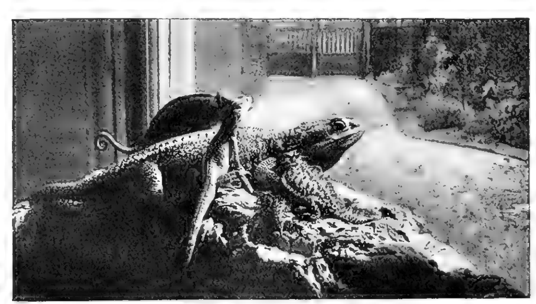
LIZARDS FROM LIFE.

STUMP-TAIL, SPINOUS, AND FRILLED LIZARDS.

Written and illustrated with photographs by W. Saville-Kent, F.L.S., F.Z.S.

THE reptile house at the Zoo represents beyond question one of the most attractive departments of that perennially popular institution. That prominent increment of the mystic and the uncanny that has been interwoven from the earliest ages with reptilian organisms—from the "old serpent" downwards—invest these creatures with a never-failing element of interest and attraction to the wonder-worshipping public. Have we not among the reptiles, moreover, in the unwieldy crocodiles and their slim relations the diversely modified lizards the direct descendants of the terrible dragons and monster saurians that lorded it over creation, and that flew or swam or even walked erect, leaving their "footprints on the sands of time," long before puny man appeared upon earth's shifting stage. Here, surely then, there is to be found abundant *recherché* manna for the mind of the philosopher as well as coarser and more highly-spiced pabulum for the palate of the proletariat.

The lizard section, which is the immediate *raison d'être* of this article, is a somewhat aggrieved community at the Regents Park, and is looking forward anxiously to the happier days of roomier cages and a modest apportionment of outside space wherein, like the big felines in the adjacent department, they can stretch their limbs and take natural exercise in the genial sunshine. As year follows year they have disconsolately witnessed cage after cage filched from their heritage for the accommodation of their unscrupulous cousins the snakes; while a crowning injustice, in their opinion, was the annexation of one of their most commodious compartments for a pair of Australian lungfishes.



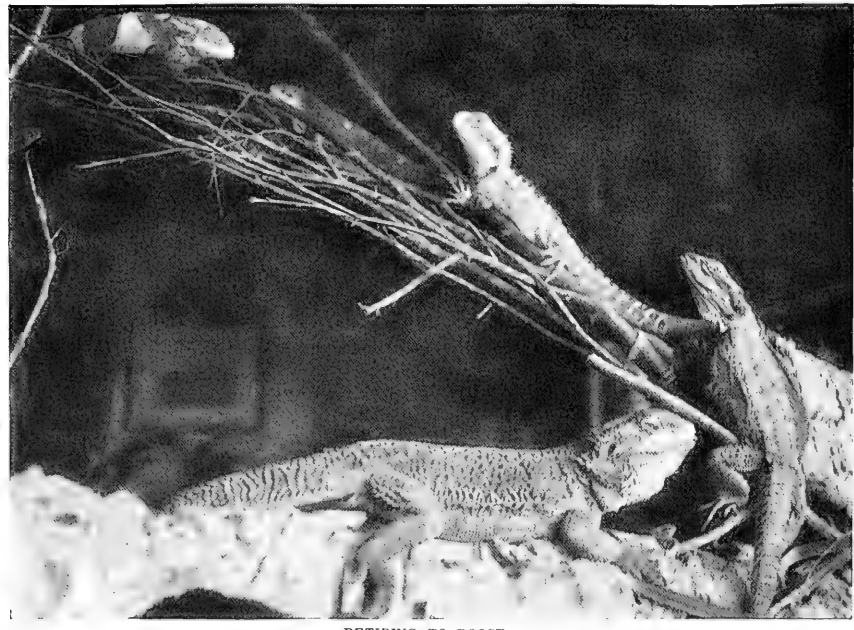
A FAMILY PARTY.

Chameleon, Jew Lizard, Horned Lizard, and Tree Lizard.

The reptile house in its entirety as it now exists would, as a matter of fact, be none too large for the adequate housing of the lizard tribe alone, of which many hundred interesting types, now unrepresented, might be

appropriately added. Pending the establishment of the new up-to-date lizard house, where all the peculiar locomotive traits and other equally interesting life habits of the lizard tribe may be intelligently observed, much new knowledge concerning them and a vast amount of pleasurable recreation may be gained by the hospitable entertainment of a few suitably selected lizard guests in the home circle. Experimental essays in this direction instituted by the writer yielded a rich harvest of material for both the quill and camera, of which but a few gleanings can be included in the present article.

The most favourable conditions for observation were probably established when the writer adapted his ordinary study, a large bow-windowed room facing south, for the requirements of his lizard guests. A simple arrangement of rough virgin cork cylinders



RETIRING TO ROOST.
Green Fiji Iguanas, Australian Water Lizard, Jew or Bearded Lizards.

around the window-sill constituted an ideal basking ground for these sun-loving creatures, into the hollow recesses of which many of the individuals would retire and pass the night. A few palms and other shrubs were provided for the essentially tree-frequenting varieties, and a shallow tank for the recreation of semi-aquatic species. A suitably located box of earth was intelligently used by the majority of the larger forms for sanitary purposes.

It was interesting to find on what amicable terms quite a large assemblage of unrelated species would settle down together and so constitute a veritable happy family. Skinks, represented by the grotesque Stump-tails, Blue-tongue and other varieties, Iguanas, Agamoids, with occasionally a Chameleon, would lay basking together for hours

PUTTING THEM THROUGH THEIR PACES.

A snapshot of the Author and some of his lizards in their bipedal attitudes.

"ROBIN," THE AUSTRALIAN WATER LIZARD.

cheek by jowl in the morning sun. Certain species, however, having eminently aggressive qualities it was found necessary to exclude from this select family circle. The Old World Monitors, the American Teguexins or Tejus, and the beautifully variegated European ocellated lizards are not safe companions of species inferior to themselves in size and strength, and if kept should be provided with separate apartments.

The sleeping idiosyncrasies of the various species under observation were varied in a marked manner. The chameleons, natural tree-dwellers, habitually clung to the branches, the tail sometimes assisting prehension, but more often being spirally coiled upon itself like the proboscis of a butterfly. Other forms that chiefly frequented the ground during the day would also resort to trees at night, the quaint Jew or Bearded lizard of Australia was one of these. Young examples would ascend as high as their weight would allow towards the apex of a slender sapling, and there cling tenaciously with interlocked claws until the morning. An altogether sociable night-camping party was commonly composed of two beautiful green long-tailed Fijian iguanas, one or more of the Australian Water lizards, with an occasional chameleon or larger Jew lizard, all of which would spread themselves close together in the happiest abandon along the horizontal branches among which the Fijian varieties were accustomed to spend the greater portion of the day. The clumsy, unwieldy stump-tails and blue-tongues would retreat within the hollow recesses of the virgin cork, while another more slender spine-tailed skink would habitually creep for his night shelter into the centre draw of the writer's desk, to which it gained access by scaling some specimen boxes that lay beside it. One member of this colony, a New Zealand Hatteria, having nearer relations with the fossil reptiles than existing lizard species, chose for its harbour of refuge and habitual abiding place the space underneath one of the pedestals of its owner's writing table, which, the better to suit its pronounced proclivities, was boarded round with the exception of a hole for exit. This individual, while at all times most amiable to its human friends, was distinctly jealous of certain of its companions in captivity. A Red-breasted Water lizard, appropriately christened "Robin," seemed more especially to excite its ire in the vain pursuit of which the hatteria would rush out from its lair with angry gruntings whenever that lizard chanced to trespass too closely upon his preserves. "Wrinkles," the New Zealander, so called on account of his beautifully wrinkled skin, was somewhat of a hermit. Except for an occasional bask in the morning sun, he usually kept very closely in his den all day, but towards evening wandered about the room or enjoyed his bath in a most lively manner. As shown by their large lustrous eyes, the pupils of which, like those of a cat, are reduced to a mere slit in bright

AUSTRALIAN JEW OR BEARDED LIZARDS.

daylight, the hatterias are essentially nocturnal in their habits. Even in the daytime, however, "Wrinkles" could generally be coaxed from his retreat by the deposit of a wriggling worm a little distance outside its entrance, more especially if "Robin" was hovering in the vicinity with the chance of carrying off the prize. It was quite a revelation to find how useful a role as an extirpator of garden pests "Wrinkles" was qualified to fulfil. Huge field slugs several inches long constituted a favourite *bonne bouche,* while snails, caterpillars, beetles, and such-like "small deer," represented his more habitual *hors d'œuvres.* Not only this species, but many other members of the lizard tribe will, in fact, render yeoman service in the garden and greenhouse in return for their hospitable entertainment. Like many another much cherished pet, poor "Wrinkles" came to an untimely end, getting accidently crushed by the opening of a greenhouse door, behind which he had apparently been chasing some attractive quarry. The writer would be greatly indebted for the opportunity of cultivating the friendly acquaintanceship of a second "Wrinkles." Perhaps a sympathising New Zealander will assist him!

Quite the most fascinating and exciting of the subjects investigated concerning the lizard menage was that of their peculiar methods of locomotion. The writer had brought home with him from Australia the singular Frilled lizard, and successfully demonstrated the reported but hitherto unproven bipedal locomotive faculties of that species. The evidence yielded by that form stimulated experimental investigation relating to the possible possession of a like accomplishment by other species. As a result various lizards, some belonging to the same family group as the frilled species, and others having entirely distinct relationships, were found to possess the same remarkable locomotive peculiarity. "Robin," the large red-breasted Australian water lizard, and his kinsfolk proved themselves to be especially agile on their hind limbs, as also the small Australian tree-frequenting species. It was more especially interesting to find that the tropical American teguexins, large predaceous species somewhat resembling the Old World monitors, also possessed bipedal proclivities. From information recently communicated to the writer, it would appear likely that a large number of the American iguanas share the same habit. Although unrecognised by science, through specimens having been kept in too confined quarters to exhibit this peculiarity, the bipedal habit of locomotion of the teguexin, or Diamond lizard, as it is locally called, was long since known to the natives of the districts it inhabits, and is a subject among others of rough rock carvings that have been executed by them—probably many centuries ago—on the banks of the Orinoco. To obtain demonstrations of their possible bipedal proclivities and a photographic record of the phenomenon, the lizards experimented with by the writer were liberated upon a

"WRINKLES," THE NEW ZEALANDER.

smooth tennis lawn, sheets being spread over the area included within the purview of the camera, and across these sheets the animals were induced to run. The photographs on page 181 will assist better than words to illustrate the quaint attitudes assumed by the running lizards. In these racing records the relatively small Australian tree lizard was notable for maintaining the most nearly vertically erect carriage. "Robin" at his best assumed the *distingué* airs of a Piccadilly dandy, while "Frills" put in a sprint with an accompanying comportment that might excusably bring tears of envy to the eyes of Mr. Murdoch or any other member of the champion Australian cricket team. In face of the demonstrated extensive prevalence of bipedal locomotion among various distinctly organised lizard groups, it is scarcely possible to get away from the conclusion that the habit has been handed (or should it be "footed"?) down to them from their primœval ancestors the Mesozoic Dinosaurs, reptiles which to a very much wider extent were accustomed to walk erect. A restored skeleton of one of these huge extinct creatures, the Iguanodon, some thirty feet in length, with an example of the frilled lizard brought from Australia by the writer and set up in its bipedal attitude from one of the photographs from life here reproduced, will be found side by side in the geological galleries of the Natural History Museum. They constitute there an appropriate illustration, notwithstanding the disparity in bulk, of the bond of affinity in the matter of a singularly developed method of perambulation that subsists betwixt the reptiles of to-day and those of the fossil past.

THE OCELLATED LIZARD.

"Punch," a few years since, treated us in his "Comic Almanack" with a set of humorous cartoons representing what might have happened if the Dinosaurians had perpetuated and more fully developed their bipedal attributes in place of evoluting into quadrupeds. Man under these conditions was a very inferior animal. Had Mr. Punch been a little more up-to-date in reptilian lore he might have "pointed the moral and adorned his tale" with a reference to some of those eccentric yet old-fashioned living lizards that continue to tread in their ancestors' footprints.

[In the next number of ANIMAL LIFE will begin a series of practical articles on the keeping of "Uncommon Pets." The articles will have the advantage of being written by a naturalist who has had personal experience of all the animals with which he will deal.]

ZOO NOTES

Described and Illustrated with Photographs by W. P. Dando, F.Z.S.

The Stillborn Elephant.

The accompanying photograph of the elephant that was born dead at the Zoological Gardens, on 31st August, was taken in the Society's mortuary soon after the event took place. As particulars of its size, etc., were given in last month's Animal Life, it is unnecessary to say more here, except to repeat the regret that the Society should have been prevented from realizing their hopes of getting a profitable and highly interesting addition to their collection.

"Guy Fawkes."

Just thirty years ago, all the press were chronicling the birth of a hippopotamus at the Zoo, for "Guy Fawkes," as the name will suggest, was born on the 5th November, 1872, and when one considers that after thirty years of captivity the animal shows every sign of good health, it speaks well for the care and attention bestowed upon the animals by the officials. As confusion as to sex has often been made with regard to "Guy Fawkes," it should be noted that *she* is a *female*. The name was chosen as a record of the date, and not on account of any exhibition of a revolutionary spirit like her namesake, for when young she was considered by some (very few, I should think) a beautiful little thing, and has given very little trouble since, but hippopotami have never been popular with the public, like their equally massive neighbours the elephants, and very little of the public food offerings finds its way inside the hippo. They are not, however, so wanting in intelligence as some persons imagine, and it is even recorded that they are fond of music. The specimen deposited at the Zoo in 1854 was brought over by an Arab snake-charmer, who was in the habit of exciting the attention of his charge by a kind of musical call, which she answered by vibrating her enormous body to and fro with evident pleasure, keeping time to the measures of the performer's tune; and whenever the band played on board the vessel which brought her over, she would invariably raise her head in the attitude of listening.

STILLBORN ELEPHANT.

Sea Lions.

What a fine exhibition and attraction to the Gardens could be made if a sufficient number of the public at holiday times could only witness the sagacity of the sea lions in the Zoo. The pond is most unfortunately situated on an eminence, and the public can only get about half round it, and when two or three deep, completely shut out all possibility of others seeing anything. The feeding of the sea lions may be considered one of the most enjoyable sights at the Zoo, and the amount of intelligence displayed by them is remarkable. The Cape sea lion is very devoted to his keeper, and his affection is of quite a different kind from that displayed by his companion the Californian sea lion, whose sole object in shrieking after the keeper is for

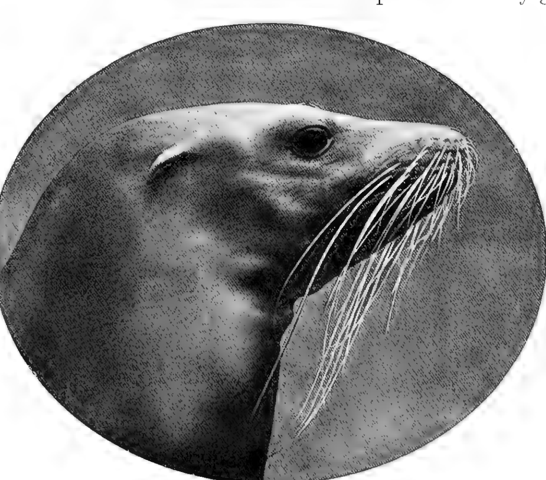
A STUDY IN GAPES, OR MANY HAPPY RETURNS.

"Guy Fawkes," whose yawning capacities are shown above, was born and bred in the Zoological Gardens. The fifth of November of this year (1902) was her 30th birthday.

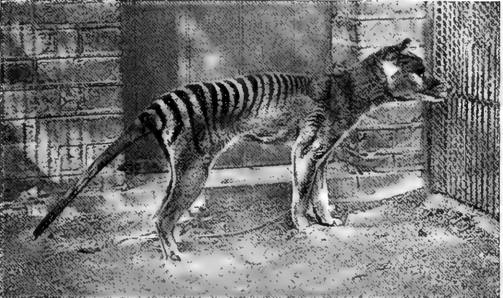
more food, whereas the Cape specimen shows real affection, which the keeper reciprocates. Strange to relate, the Society have not had a seal in the collection for years, although a good specimen, which should not be difficult to get, would be a great attraction.

Thylacine or Tasmanian Wolf.

FOR some time the Tasmanian wolf was housed in the small mammal's house, but it has now been placed with the other marsupials or pouched animals in the kangaroo sheds. This strikingly-marked animal is becoming very rare, and at the present moment is only found in the very remote parts of Tasmania. It is the largest carnivorous marsupial at present living. The Colonists used to call it "Tigie" on account of the series of transverse black bands on the hinder part of the back and loins, to show which a special photograph was taken, after a weary waiting. To-day it is commonly called "Wolf," and by reason of the havoc it commits among the sheep-fold, has become nearly exterminated in those parts of the island where there is a fairly large settlement. In the shelter of the almost impenetrable rocky glens and caverns of the mountainous regions of Tasmania, specimens may still be discovered, but the fact that the animal is a *very* scarce one, should not be lost sight of by anyone who delights in seeing something alive which may soon become extinct.



CALIFORNIAN SEA LION.



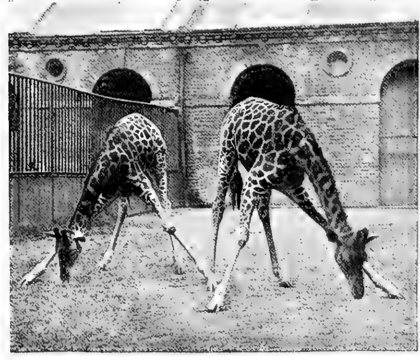
THAT the Zoological Society has been more unfortunate with its giraffes than with any other specimens in its vast collection there is no doubt, and the losses sustained must have amounted to many thousands of pounds. All visitors will remember the fine male that died this spring. It suffered from a sort of neck dislocation, which was most probably caused by the manner of its capture. These animals are mostly caught by the lassoo, and then are immediately taken to the nearest tree, tied up by the neck and allowed to "kick themselves out" for twenty-four hours. If when their captors return they have not strangled themselves or broken their legs, they are at least tractable, and are then led down country. In 1866, the giraffe house caught fire, and two of the inmates succumbed to the flames, another one dying shortly afterwards from shock.

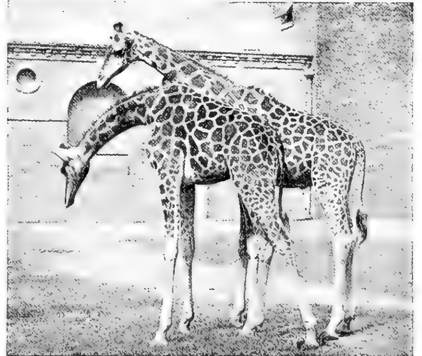
Giraffes.

TASMANIAN WOLF.

All these misfortunes look like being altered now, for instead of the Society having to give nearly £1,000 apiece for giraffes, thanks to the generosity of that gallant soldier Colonel Mahon, C.B., D.S.O., who by relieving Mafeking gave London, or I should say Greater Britain, the opportunity of celebrating the relief of General Baden-Powell's world-renowned stand, has given to London second cause for joy and delight, by presenting a pair of young (adult) giraffes from Kordofan to the Society.

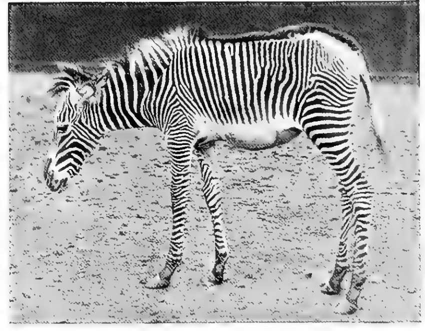
England can boast of being in possession of the only pair of giraffes (in captivity) in the world. Several single giraffes exist in other zoological collections, but like the female that now towers above the two-year-old filly and twenty months male housed beside her, they are "on the shelf," and until the advent of Colonel Mahon's princely gift, it seemed as though





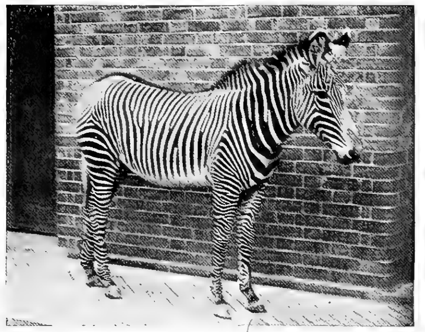
THE NEW GIRAFFES "SELIM" AND "FATIMA."

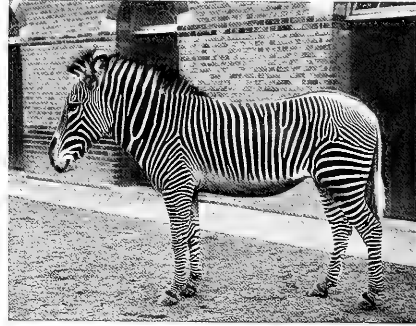
all attempts to breed the giraffe at the Zoo was a most costly and vain pursuit; but as the pair are in the best of health and still growing, there seems every possibility that we shall in time have the pleasure of recording a most important and unique addition to the Society's collection,



Gifts from H.M. the King.

THERE are at the present moment three magnificent specimens of the Grevy zebra deposited in the Zoo by H.M. the King; only one other exists in Europe, and that one on the estate of the Duke of Bedford. All four are, unfortunately, females, and





GREVY ZEBRAS. THE GIFT OF THE KING.

labelled *Born in the Menagerie*. Colonel Mahon has given the female the Arabian name of "Fatima," which seems most appropriate, as a more typical personification of female curiosity it would be difficult to find among the female animals at the Zoo; and it was no doubt from observations of a similar nature that induced the Colonel to name this beautiful specimen after Bluebeard's seventh wife. The male he has named "Selim," after one of the Sultans of Turkey, anticipating many wives for this choice beast.

the giraffe trouble (fortunately solved) applies equally to these beautiful animals. The largest specimen, which was presented to the late Queen Victoria by Emperor Menelik, is about eight years old and is a very fine shaped mare, and the other two will, no doubt, make equally graceful beasts. The markings on each of the animals are dissimilar so far as design is concerned, and although each have their points of beauty, it is generally admitted the late Queen's animal is the most beautifully marked.

NOTES AND COMMENTS.

Chestnut Partridge.

The Chestnut-bellied Scaled Partridge is a favourite game bird in the region where it is found (North Eastern Mexico and Lower Rio Grande Valley in Texas).

These birds raise two broods to the season, and fifteen seems to be the average number of eggs they lay. The nest is simply a slight hollow scratched out in the sand, commonly under a clump of grass or close to a prickly pear bush. These birds are often found miles away from water, and in the most arid districts imaginable. They are very difficult to flush, and often elude the sportsman by their rapidly running over the ground through the scanty vegetation without taking flight. To some extent their sombre plumage also protects them, simulating as it does the colour of the ground most frequently chosen for their habitat. Sometimes as many as thirty or forty birds occur in a single bevy, in rare instances as many an hundred or more. As in the case of all partridges, the young, when first hatched, are very beautiful little things, and very active. The food of the chestnut-bellied scaled partridge consists principally of certain seeds, berries, tender buds of plants, and a variety of insects. We are indebted to Dr. R. W. Shufeldt for the above information and for the photograph of the bird.

CHESTNUT-BELLIED SCALED PARTRIDGE.

(Callipepla squamata castanogastris.)

Mexican Hairless Cats.

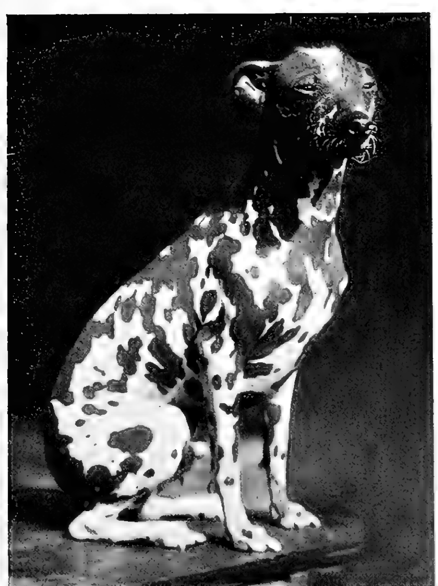
UNDOUBTEDLY the most curious of all the feline tribe, and the rarest also, are the curious looking creatures represented in the accompanying photograph, lent us by Mr. H. C. Brooke, to whom their owner, Mr. Shinick, of Albuquerque, New Mexico, gave the following description :—"These cats were obtained from Indians a few miles from here. The old Jesuit Fathers say they are the last of the Aztec race and known only in New Mexico. They are exactly like a child's. 'Nellie' weighs about 8 lb. and 'Dick' 10 lb." Later, Mr. Shinick wrote:—"Dick was a very powerful cat, and could whip any dog alone; his courage no doubt was the cause of his death. He was a sly rascal and would steal out, and one night he got out and several dogs killed him. His loss was very great, and I may never replace him. The Chicago Cat Club valued him at 1,000 dollars. I have sent all over the country and endeavoured to get a mate for 'Nellie,' but I fear the breed is extinct."

MEXICAN HAIRLESS CATS.

marked exactly alike, with mouse-coloured backs, the neck, stomach and legs a delicate flesh tint; their bodies are always warm and soft. In the winter they have a light fuzz on the back and ridge of tail which falls off in the warm weather. They stand the cold as well as other cats; their skin is very loose. 'Nellie' (the female) has a very small head, large amber eyes, and long whiskers and eyebrows; her voice now is a good baritone, when young it sounded

Mexican Hairless Dog.

SIDE by side with the hairless cats it will be interesting to compare the hairless dogs from the same country. These animals are found not only in Mexico, but also in China and Japan. "Paderewski, Junior," whose portrait (by kind permission of its owner, Mrs. H. C. Brooke) we give, is, with the exception of a very few straggling hairs on his head, perfectly hairless; other specimens have a more or less thick crest or top-knot; others, again, have a

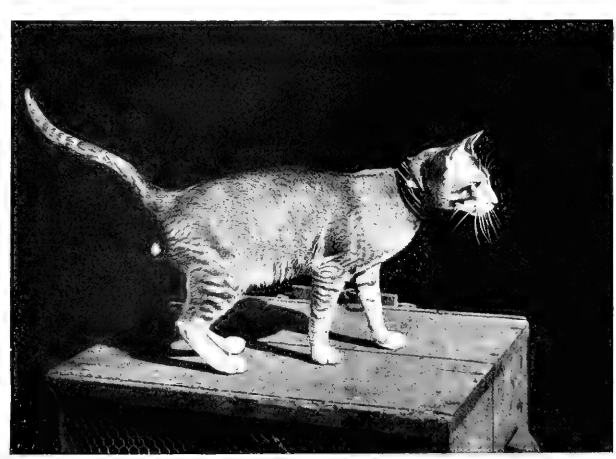


MEXICAN HAIRLESS DOG.

tuft of hair on the tip of the tail. They vary greatly in colour: black, slate colour, pink, with or without brown or black patches, mottled brown, are all admissible colours. They are usually very affectionate and intelligent. In size and build they should resemble a small or medium-sized, well-built terrier. The dentition of these dogs is curious, they usually only possessing the incisors, canine, and one molar tooth on each side. Nevertheless, they can gnaw bones well, and many are good sporting dogs; "Paderewski" possesses an excellent nose and is a good ratter, whilst his sire, the "Hairy King," also a great winner at shows, used to hunt with beagles, and bore many a scar testifying to his prowess in charging through thorns in pursuit of Bunny.

The Indian Cat.

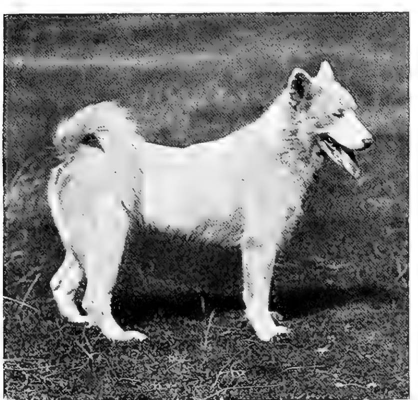
SOME of the varieties of the domestic cat of India are evidently derived from the smaller wild breeds of that country. From what variety is derived the peculiar cat whose photograph we give (lent us by Messrs. Harmsworth) it is hard to say. The colour of this cat above is a beautiful light chestnut red, fading through various shades of golden yellow to white underneath. On the sides he is beautifully pencilled, and faintly striped on the legs. The forehead is wrinkled like that of a Chow dog; head, long, shallow and pointed, legs very long and slender, the tail of great length and tapering like that of a pointer. The coat is extremely short; ears thin, large and mobile; eyes, piercing in expression, of clear amber colour. His calls are varied, and somewhat resemble the raucous voice of the Siamese cat. The most careless observer will at once note certain structural features in which this cat differs from the common cat. He has won many first prizes, and is the property of Mrs. H. C. Brooke, of Welling.



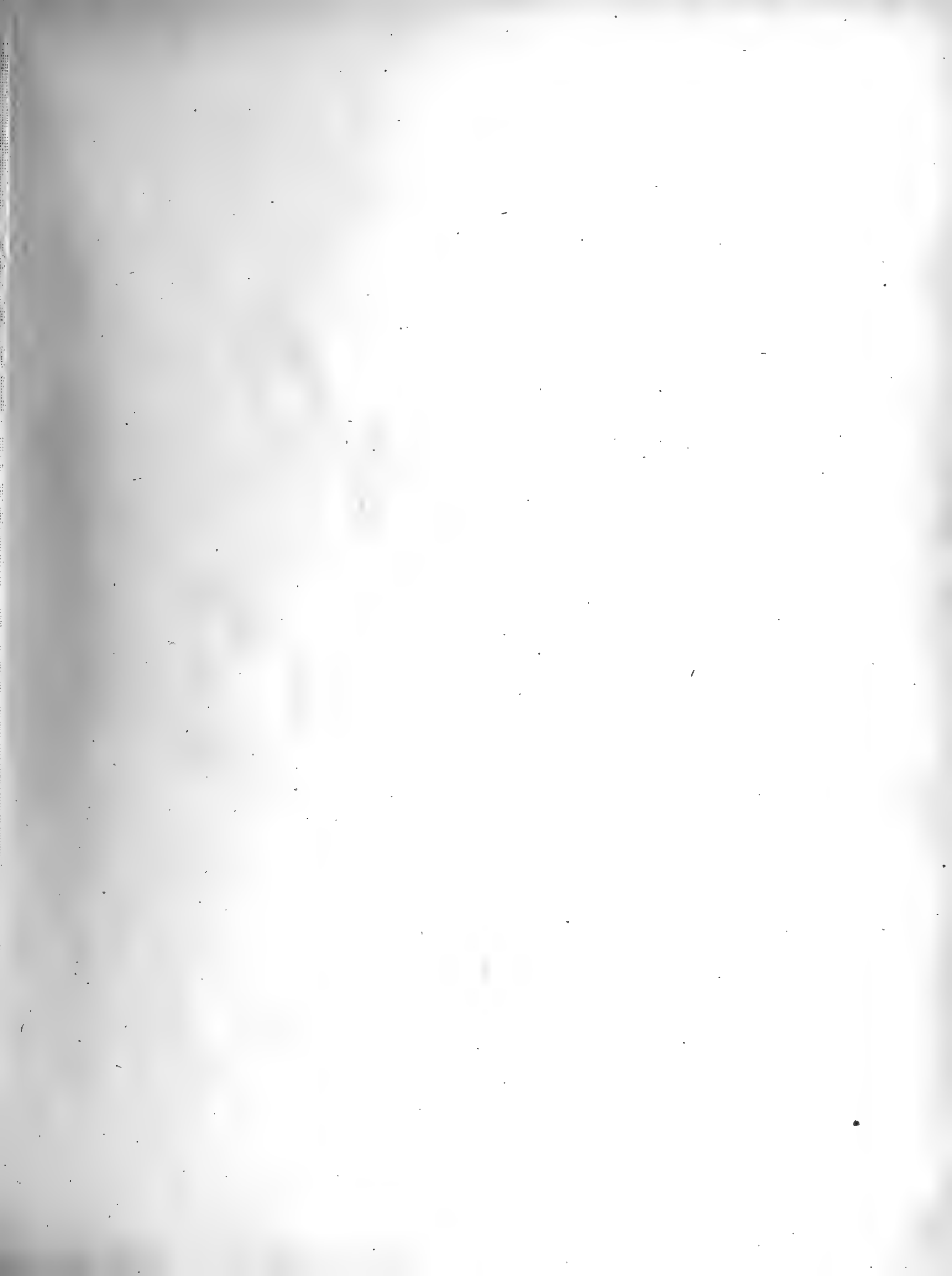
INDIAN CAT.

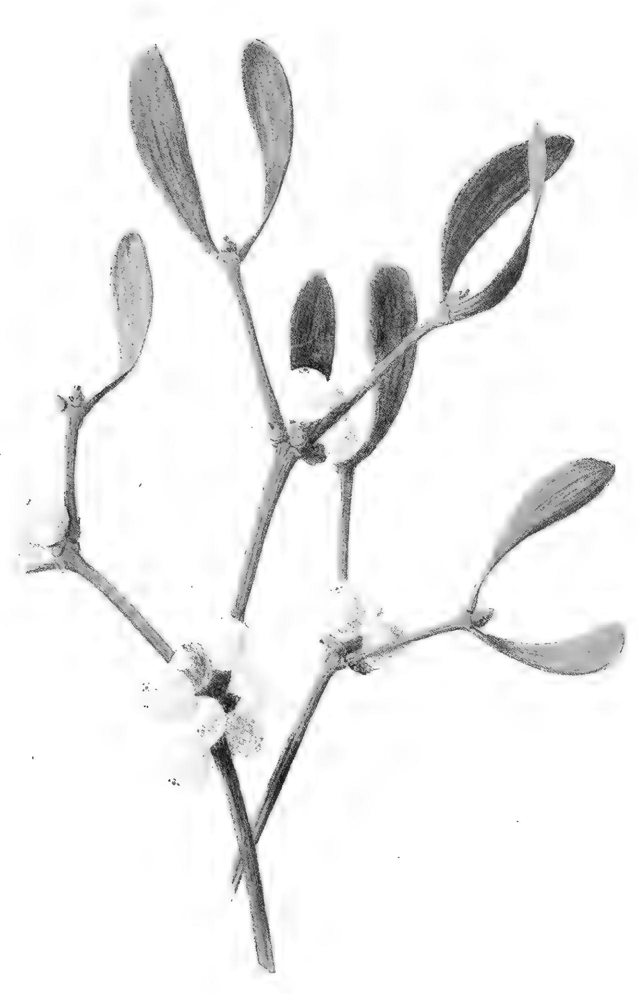
Esquimaux Dogs.

About twenty years ago there used to be exhibited in the Bears' Den at the Zoo a white Esquimaux dog which, if we remember rightly, was brought to this country by one or other of the Polar Expeditions. Since then, we believe no pure white specimen has been seen in this country, except the young bitch here portrayed, which was imported by Mr. H. C. Brooke from Greenland, and is the joint property of that gentleman and of Mr. A. P. King, who now owns "Arctic King," whom he purchased from Mr. Brooke two years back. Mr. Brooke also owned "Farthest North," who at the time of his death was the last member left of the pack used by Lieutenant Peary in his Polar expedition. "Farthest North," who is now stuffed in the Natural History Museum, was the subject of Miss Maud Earl's painful Academy picture, "The Last of the Expedition," in which he is portrayed, gaunt and starving, gazing wearily into the fathomless waste of snow, his companion in misery lying dead beside him in harness. But our knowledge of the breed leads us to think the picture, beautiful though it be, somewhat improbable, for we are sure the survivor, ere giving himself up to despair, would have partaken of a chop from his late mate, and then have proceeded to free himself by gnawing through the rawhide harness which fastened him to the sledge. We are also able, thanks to Mr. H. C. Brooke, to give a portrait of "Arctic King," mentioned above. This dog was imported from Hudson's Bay, and whilst in its original owner's possession attained a record never equalled by any other foreign dog of any variety, having won nearly one hundred first prizes at leading shows all over England, Scotland, and France. The dog is still alive, but is now never shown, his owner having not unnaturally been exceedingly annoyed at his having on the last occasion been placed behind an inferior dog by a judge who had never owned, bred, or even judged an Esquimaux dog in his life. He possesses a wonderfully dense coat of two kinds, a thick underwool and a stiff outer coat, together forming an admirable covering. When deep snow was on the ground it was his delight to scratch out a hole in which he would lie, dreaming, maybe, of the days of his youth spent in Arctic climes. Imported dogs of this variety, if given a cod's head, usually succeed in separating all the flesh from the bones as neatly as might be done by a surgeon with his dissecting knife, a task which, if set to an ordinary dog, would probably result in his death from choking.



ESQUIMAUX DOGS.
A pure white specimen and "Arctic King," the winner of nearly 100 first prizes.





MISTLETOE.

From the original painting by F. EDWARD HULME, F.L.S.

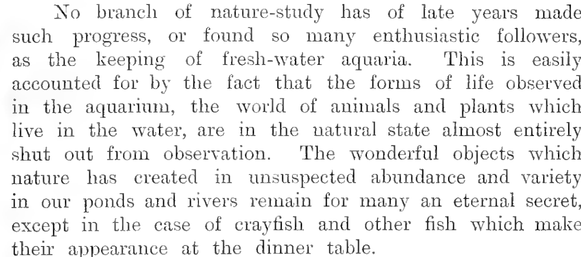
THE HOME AQUARIUM.

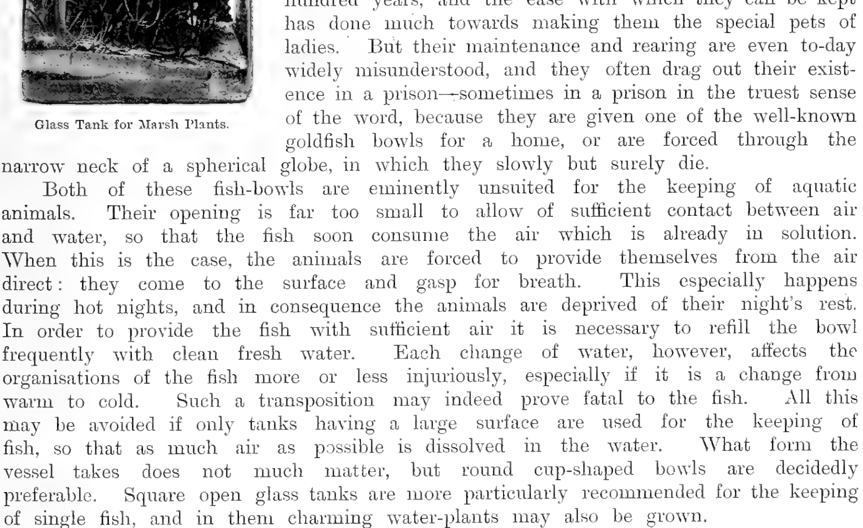
By Dr. E. Bade.

Illustrated with photographs by the Author.

THE keen business competition of to-day compels most of us to live in town during the greater part of the year, and we are consequently restricted to a very few weeks in which to contemplate nature. A vague force is, however, continually urging man to keep in touch with nature, and so nature must come to him, since it is denied him to go and study her in freedom; he instals in his home a small fragment of nature.

No branch of nature-study has of late years made such progress, or found so many enthusiastic followers, as the keeping of fresh-water aquaria. This is easily accounted for by the fact that the forms of life observed in the aquarium, the world of animals and plants which live in the water, are in the natural state almost entirely shut out from observation. The wonderful objects which nature has created in unsuspected abundance and variety in our ponds and rivers remain for many an eternal secret, except in the case of crayfish and other fish which make their appearance at the dinner table.



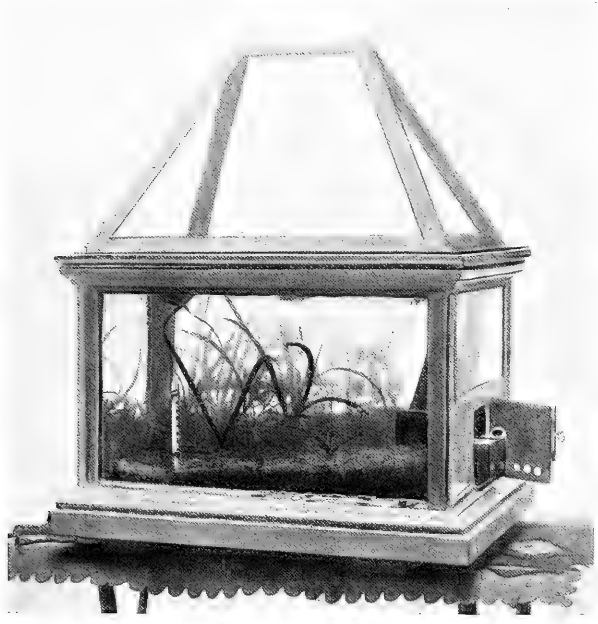


Glass Tank for Marsh Plants.

Goldfish are in the first place largely responsible for the extension of the custom of keeping aquaria. They have already been employed as ornamental fish for over a hundred years, and the ease with which they can be kept has done much towards making them the special pets of ladies. But their maintenance and rearing are even to-day widely misunderstood, and they often drag out their existence in a prison—sometimes in a prison in the truest sense of the word, because they are given one of the well-known goldfish bowls for a home, or are forced through the narrow neck of a spherical globe, in which they slowly but surely die.

Both of these fish-bowls are eminently unsuited for the keeping of aquatic animals. Their opening is far too small to allow of sufficient contact between air and water, so that the fish soon consume the air which is already in solution. When this is the case, the animals are forced to provide themselves from the air direct: they come to the surface and gasp for breath. This especially happens during hot nights, and in consequence the animals are deprived of their night's rest. In order to provide the fish with sufficient air it is necessary to refill the bowl frequently with clean fresh water. Each change of water, however, affects the organisations of the fish more or less injuriously, especially if it is a change from warm to cold. Such a transposition may indeed prove fatal to the fish. All this may be avoided if only tanks having a large surface are used for the keeping of fish, so that as much air as possible is dissolved in the water. What form the vessel takes does not much matter, but round cup-shaped bowls are decidedly preferable. Square open glass tanks are more particularly recommended for the keeping of single fish, and in them charming water-plants may also be grown.

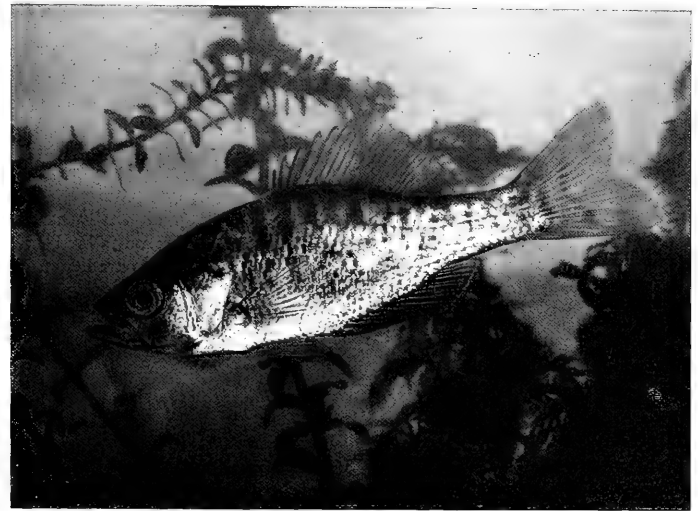
Water-plants, especially those that grow *under* the water, have a great influence on the health of the animals. They give up oxygen to the water, and assimilate for their own growth the carbonic acid which the fish exhale. They only do this, however, when they are growing in soil. For this, peat-earth mixed with sand and loam, or the earth of a molehill, is employed. The layer of earth should be placed in the aquarium so that it slopes slightly towards one corner. Where it is deepest, well-rooted marsh-plants should be planted. Above the layer of earth is placed a layer of clean, well-washed river-sand about ¾-inch deep; this prevents the earth from penetrating. In the sand may be set water-plants, such as water-moss, which possess no roots, or seedlings of foreign plants with sprouting roots. These seedlings are buried deep in the sand, so that only their tips project, for only that portion which afterwards grows in the aquarium retains its fresh green foliage. Other plants are *Cabomba cariolana*, the various varieties of millfoil, etc. Subaquatic plants whose roots are only small should also be placed here. After the bottom has been planted, the aquarium may be filled with water. Where the sand is smoothest, a piece of stout paper should be spread and the water carefully poured in over this until the vessel is full.



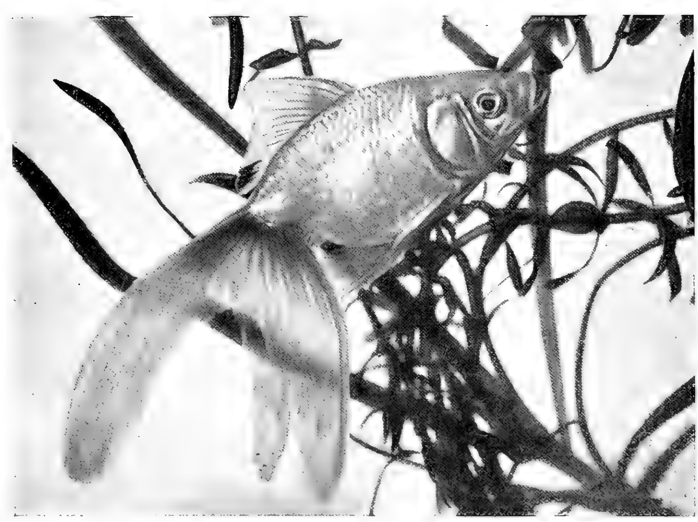
AQUARIUM FOR TROPICAL FISHES.

Only animals which live permanently in water are eligible as inhabitants of the aquarium. Frogs, newts, lizards, tortoises, etc., cannot pass as such, and must be excluded from the list.

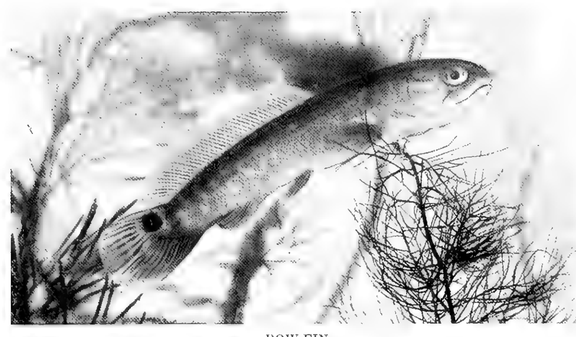
For the beginner, the most suitable fish is the paradise fish, a native of China which has been imported for many years, and willingly breeds in the aquarium, building for this purpose a nest of froth on the surface of the water. Other delicate fish are the various kinds of perch imported from North America, and the canchito, which hails from Brazil, whence, of late, its beautifully-coloured cousin, the Brazilian fish, has been imported. These both breed in aquaria of larger size, and present a charming family picture during the rearing of the brood. More difficult of cultivation are the different derivatives of the goldfish—the beautiful veil-tailed goldfish, with its widely-expanded, ornamental appendage, and the quaint telescope veil-tailed goldfish, with its tubular eyes standing far out of its head. Highly interesting but quite small fish, newly-imported, are the lively and prolific *Girardini*, a small variety of carp, of which the female is larger than the male. From these a cross has been obtained between



NORTH AMERICAN ROACH.

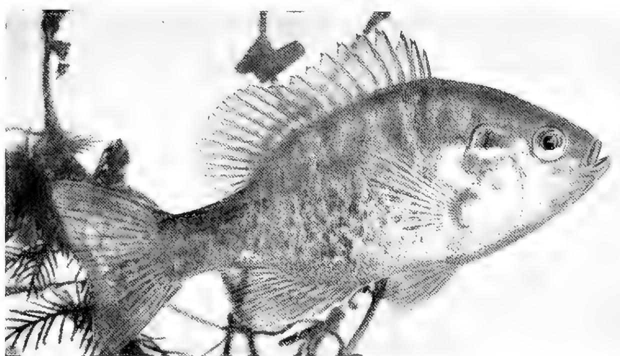


VEIL-TAILED GOLDFISH.

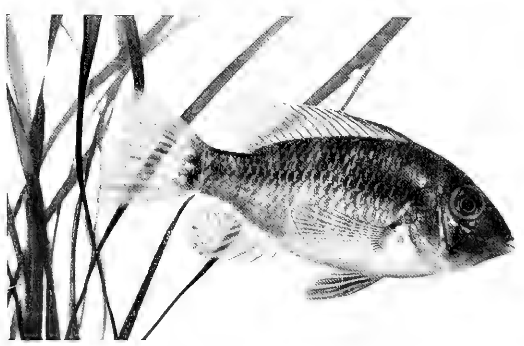

BOW-FIN.

Girardinus unitotatus and *Gambusia Holbrooki*, which is distinguished for its elegance and small size. The *Girardini* also breed in the aquarium.

Of native fish, both varieties of the stickleback, and the carp, are profitable and interesting inhabitants of the aquarium. Both are comparatively easy to rear, and the student who has already bred with success the paradise fish, which is very easily brought up in confinement, will find great pleasure in the rearing of stickleback and carp. The former build a nest of vegetable matter for their eggs, whilst the carp lay their eggs in the crevices of shells of the fresh-water mussel, which the young afterwards quit, to exhibit themselves as quite large fish in the aquarium.

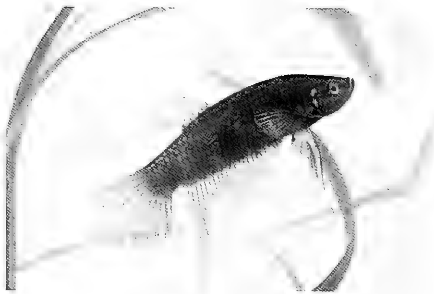

NORTH AMERICAN GOLDFISH.

Whilst the fish so far mentioned may be kept during the winter in an unheated aquarium, provided it is placed in a room of even temperature, it is necessary for the keeping of tropical fish to provide the tank with a heating appliance. The illustration on page 194 shows a simple form of aquarium with heating apparatus. In this, half of one pane of glass in the smaller side of the receptacle is replaced by a sheet of zinc, which forms one side of a closed water-tight zinc box, from which a broad slanting tube leads to the surface of the water. The heating is accomplished by means of the small flame of a spirit-lamp. Such a tank is suitable for the Indian fighting fish (one of the most brilliantly coloured fish hitherto imported), the

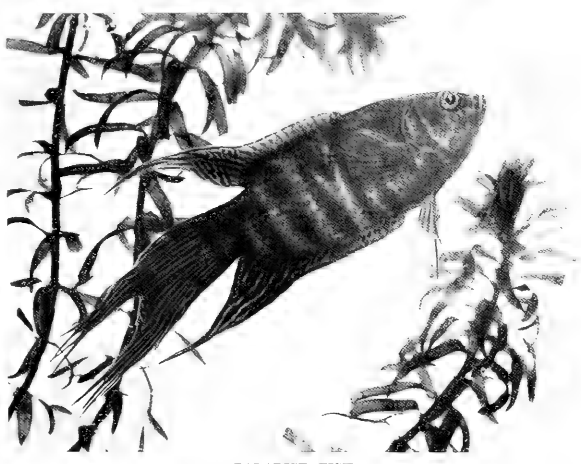

BRAZILIAN FISH.

different varieties of *Gurami*, and the climbing perch, etc. The fighting fish and the *Gurami* both breed easily in such an aquarium.

In the stocking of an aquarium one needs to be careful that peaceable fish are placed only with peaceable, and fish of prey only with those capable of defending themselves. A sharp line, however, cannot be drawn, for large fish attack small ones indiscriminately, but small fish, even if they are pugnaciously disposed, do not annoy large ones. Fish should be fed on varied food, but it must not be too rich. They may be given lean beef and veal chopped fine, small worms, insects, etc., but ants' eggs, bread, biscuits, etc., are entirely unsuitable foods for fish.



SIAMESE FIGHTING FISH.



PARADISE FISH.

The water never requires changing in a naturally purified aquarium. The longer such a vessel stands the clearer and sweeter it becomes: only the evaporated water need be replaced.

It is to be hoped that the practice of keeping aquaria will become even more widely popular than at present, for an incentive to the study of nature is especially valuable to children who live in large towns.

HOLLY.

"Even before the days of Christianity we find the Romans adorning their homes with holly and other evergreen foliage, since the great feast in honour of Saturn fell in the Winter season; neighbour presenting to neighbour great bunches of holly in token of good-will, thus antedating in their religious worship and kindly greeting something at least of the spirit of the glorious song of the angels at the birth of the Messiah. The early Christians instead of striving to abolish ingrained customs, confirmed them, but diverted their meaning, and so the evergreen boughs became the symbol of immortality, the expression of rejoicing in the birth of Christ; while the sharply-pricking leaves and blood-red berries foreshadowed, in an age of symbolic teaching, the ensanguined cross of thorn, the ultimate triumph won through suffering and death."—F. Edward Hulme, in "Wild Fruits of the Country Side."

UNCOMMON PETS.

The first of a series of articles on the Care and Keep of Animals in Captivity.

By P. Wellington Farmborough, F.Z.S., F.E.S., etc.

I.—JERBOAS, KANGAROO RATS, AND RAT KANGAROOS.

THE keeping of pets is almost as old as the existence of mankind. It is a natural tendency of the human race to subjugate to its will, either by force or kindness, captive animals of all kinds; and even to-day, where civilization has not as yet made any progress, explorers have found that many savage races have in their villages or habitations tamed animals caught in the neighbouring plains or jungles which have no uses in the scale of domestic economy as sources of food supply or of services as beasts of burden. The writer, in the early years of his attempts at keeping what—for want of a better term—may be described as "uncommon pets," had many failures and disappointments by reason of there being no literature on the subject to which he could refer for information; there were plenty of manuals on rabbits, guinea-pigs, pigeons, fancy mice and such-like, but nothing whatever on animals non-indigenous to this country, and his only means of obtaining information was by making enquiries at the various Zoos—both at home and abroad, principally the latter—when visiting them, and also by asking questions from travelling menagerie people, who, however, seldom gave any information of a reliable character.

It is with a view of assisting would-be owners of animals not often seen in captivity, excepting in zoological gardens, that this short series is being written, that they may be enabled to know where to obtain uncommon pets, how much they will have to pay for them, how to keep them, and on what to feed them, besides their management in general.

There are several species of Jerboas, but the one most often imported, and therefore the most familiar of these little animals, is the Egyptian jerboa *(Dipus jaculus)*. As a pet it can be most strongly recommended. It is gentle and playful, of quaint appearance, prettily coloured, and attractive in its movements, hopping about with bird-like actions. They possess the uncommon merit among foreign animals of being cheap—three half-crowns being about a good average price—and are not as a rule so difficult to procure as are some other mammals, Hagenbeck, of Hamburg, Harris, of Newcastle-on-Tyne, and Hamlyn, of St. George's Street East, usually having specimens on hand. For its size the jerboa requires a rather large cage, certainly not less than three feet in length by two feet in depth, and the same in height; if more room can be spared and the cage made larger in the same proportions, so much the better. There is no need for a partitioned-off space as a sleeping apartment, a small wooden box about ten inches square, with a three-inch circular hole cut in one side, being equally, if not more, serviceable. Jerboas being true rodents, it is as well—as a precautionary measure—to cover all projecting edges of woodwork with thin sheet zinc. The front of the

EGYPTIAN JERBOA.

RAT KANGAROO.

cage may be of half-inch mesh galvanised wire netting; but bird-cage wire has a neater appearance and gives a better view of the inmates, and by some is to be preferred on that account. The floor of the cage must be covered with an inch or two of sand, as the natural habitats of jerboas are the arid and desert districts where, so exactly does the colour of their fur harmonise with their surroundings, that they are seldom noticed, although very numerous. They are gregarious animals, and, if possible, a pair should be obtained, so that the one can have the benefit of the other's company.

The food must be as dry as possible, the staple diet being oats and millet-seed, but corn and almost any grain can be given. Green food is relished, but care must be taken to free it from all external moisture. Water is freely taken. Jerboas in a wild state are nocturnal in their habits, and are so to a great extent in captivity, usually sleeping during the greater part of the day and making their appearance in the afternoon, being most lively between the hours of six and ten in the evening. A small branch of wood serves to amuse them for hours, as they like stripping the bark off.

Another species of jerboa is the Kirghiz jerboa (*Alactaga decumana*). The two specimens of this jerboa possessed by the writer were more strictly nocturnal in their habits than the Egyptian species, seldom emerging from their sleeping box until deep twilight had set in; in other respects, however, there were no noticeable differences of habits. They greatly relished a supply of insect food, such as grasshoppers and meal-worms, and insects of some kind should be given at intervals; their staple diet is the same as for the Egyptian jerboa. Neither species, when asleep, should be disturbed, as nothing is more detrimental to the well-being of a pet animal than to be continually pulled out of its sleeping box to be "shewn off." The interior of the sleeping box should be filled with the freshest of clean hay, frequently renewed. Both kinds of jerboas gnaw the hay down into a convenient length to suit their comfort.

The jerboas are all found in the Eastern World, their relations in the West being known as the Kangaroo Rats (*Dipodomys*). These animals are not so commonly imported as they might be, consequently they are more expensive; three to five, or even more, pounds would not be an out-of-the-way price to pay for them. Their habits, both when wild and in a captive state, correspond very closely to those of the true jerboas, and the management in captivity is identical. The only one that the writer has had experience of is *Dipodomys phillipsi*, the species found to the east of the Rockies. In disposition it is as readily tamed as the jerboa, but does not appear so playful in its habits; it drinks much less frequently than either the Egyptian or Kirghiz jerboa.

An animal which is occasionally sold as the Kangaroo Rat is the common Rat Kangaroo (*Potorius tridactylus*), but this creature is a native of Eastern Australia. Unfortunately, from a pet-keeping point of view, it possesses a great disadvantage, inasmuch as it is well-nigh untamable. Rat kangaroos are to a great extent nocturnal in their habits, and leaves, grass, roots, and bulbs form their diet. By the kindness of Mr. Hamlyn, the well-known animal importer of St. George's Street East, I am able to give a photograph of one in his possession.

A MALE LION-TIGER HYBRID OF A MALE LION AND TIGRESS.
The first ever bred.

LION-TIGER HYBRIDS.

By H. A. Bryden.

HYBRIDS from the mating of lion and tiger are by no means common. In the wild state they are unheard of, although in parts of Asia these animals were, and still are, occasionally found in the same haunts; and even in captivity, where cubs from the coupling of the two species have been produced, these mixed offspring have been usually poor specimens, very difficult of rearing. It has remained for one of the most enterprising collectors and naturalists of our time, Mr. Carl Hagenbeck, not only to breed, but to bring successfully to a healthy maturity, specimens of this rare alliance between those two great and formidable *felidæ*, the lion and tiger. The illustrations will indicate sufficiently how fortunate Mr. Hagenbeck has been in his efforts to produce these hybrids. The oldest and biggest of the animals shown is a hybrid born on the 11th May, 1897. This fine beast, now more than five years old, equals and even excels in his proportions a well-grown lion, measuring as he does from nose to tip of tail 10ft. 2in. in length, and standing only three inches less than 4ft. at the shoulder. A good big wild lion will weigh about 400lbs. — Mr. Selous gives the length of a lion shot by himself as 9ft. 11in., its height as 3ft. 8in., and its weight as 410lbs.— and it is probable that in very exceptional cases lions

A PAIR OF YOUNG LION-TIGERS.
Born 30th April, 1902. The photograph shows them, at the age of four weeks, being suckled by a terrier bitch.

may attain 450 and even 500lbs. But the hybrid in question, weighing as it does no less than 467lbs., is certainly the superior of most well-grown lions, whether wild-bred or born in a menagerie.

This animal shows faint striping and mottling, and, in its characteristics, exhibits strong traces of both its parents. It has a somewhat lion-like head, and the tail is more like that of a lion than of a tiger. On the other hand, it has little or no trace of mane. It is a huge and very powerful beast, but, like most of Mr. Hagenbeck's feline pets, has been reduced to a state of comparative tameness, taking part in the shows given by a keeper, with other *felidæ,* such as lions, tigers, leopards and pumas, not to mention dogs and various species of the genus *Ursus.*

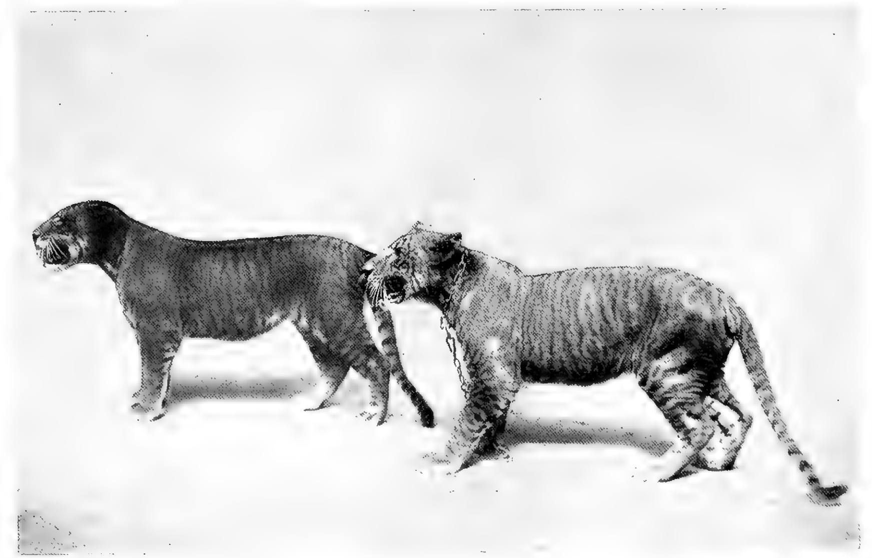
The next hybrids are a pair born, like the bigger animal, of lion father and tigress mother. They are about seventeen months old, having been born on the 28th April, 1901. They show far more of the tiger striping than their elder relative, and are altogether

A MALE LION-TIGER OF A MALE LION AND TIGRESS.
Born 11th May, 1897. Height, 3 ft. 10 in.; length, 10 ft. 2 in.

much more tiger-like in appearance. At the age of twelve or thirteen months—when photographed—they were already as big as most full-grown lions and tigers, and they promise to develop into enormous specimens of the great cat family. They are, apparently, although reduced to a certain state of tameness, none too sweet tempered, judging from their photographs. The small photograph supplied by Mr. Hagenbeck shows another pair of hybrid cubs—mere babies, born in April of the present year and photographed a few weeks later. They lie with their foster-mother, a fox terrier, whose services had to be called in for the purpose of rearing them. They, too, show strong traces of striping; but as lion cubs in extreme infancy show a good deal of marking also, chiefly spots and blotches, it is possible that these stripes may to some extent disappear as they approach maturity.

These experiments of Mr. Hagenbeck are extremely interesting, but, whether fortunately or otherwise, it is almost certain that the breeder of these strange crosses between lion

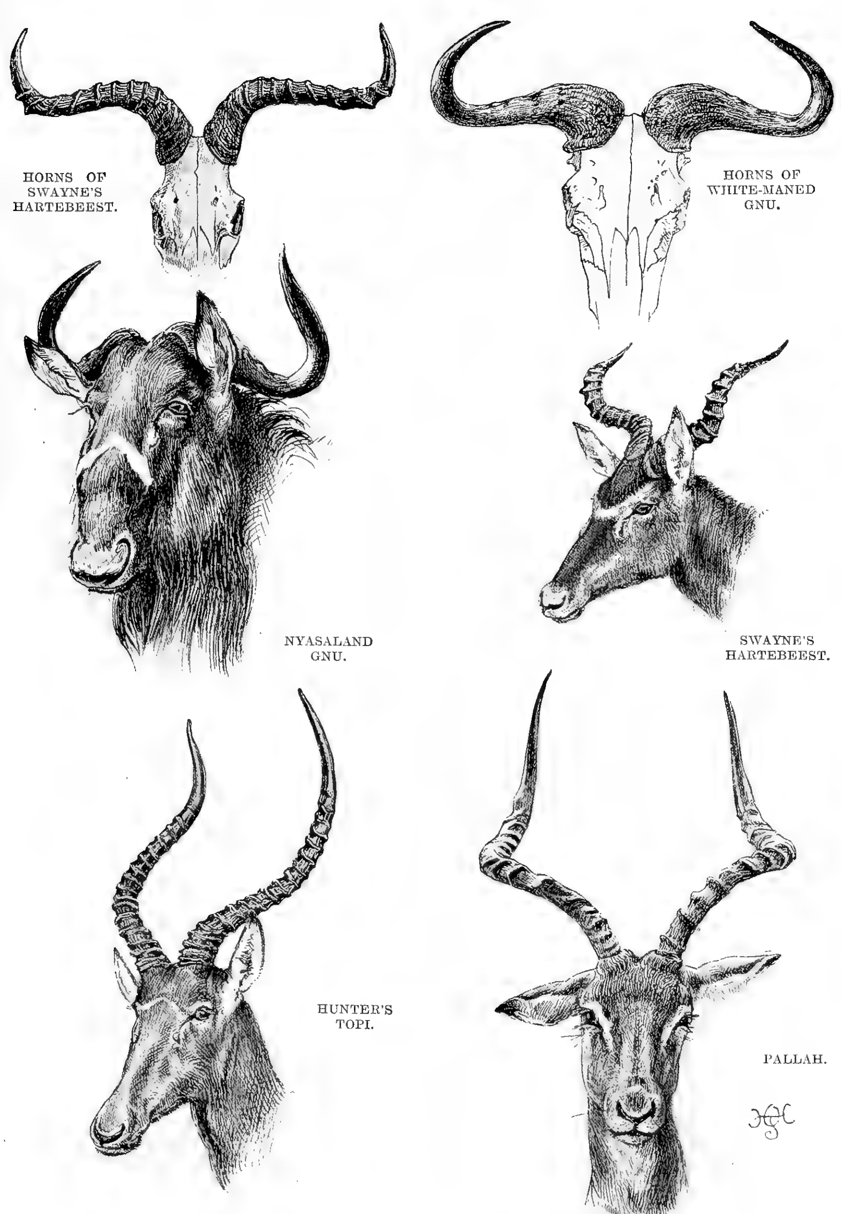
and tiger will never succeed in perpetuating a race of feline mules. Hybrids are notoriously infertile, and although mares—the mules of horses and asses—have strong maternal instincts, and will even develop milk and suckle young foals, which they manage to decoy away from their true mothers, there is, I believe, no genuine recorded instance of such a mule bringing forth offspring of her own. Already, I understand, Mr. Hagenbeck has mated the big lion-tiger hybrid with other pure-bred felines, but with no result. Darwin long since pointed out, in his "Origin of Species," that "hybrids raised from two species which are very difficult to cross, and which rarely produce any offspring, are generally very sterile." That assertion seems to be borne out strongly by the present case, and it seems altogether unlikely that any perpetuation of this new kind of fancy stock is to be looked for. Nor, indeed, is it desirable. In their own wild habitats, and after their own fashion, lions and tigers are necessary and very splendid creatures. A bastard strain from the crossing of these two species is not in the least likely to add to



TWO MALE LION-TIGERS OF A MALE LION AND TIGRESS.
Born 28th April, 1901. Height, 30 in. up to shoulder ; length, 91 in.

the beauty of the wildernesses of Africa or Asia or to the usefulness of two necessary forms in the scheme of nature. Nor in civilized countries, beyond the mere fact of producing a "sport," or curiosity, are these hybrids likely to be of interest or of use to anyone. In this case, at all events, nature seems to have wisely set limits which even the ingenuity of man is not likely to be able to evade. The causes of the sterility of first crosses and of their hybrid progeny were subjects that puzzled even that profound thinker and enquirer, Darwin. He arrived at the conclusion that such sterility had not been acquired by natural selection. "In the case of hybrids," he says, "it (sterility) apparently depends on their whole organisation having been disturbed by being compounded by two distinct forms; the sterility being closely allied to that which so frequently affects pure species, when exposed to new and unnatural conditions."

H. A. Bryden



Drawings by Sir Harry Johnston.

HEADS AND HORNS OF BUBALINE ANTELOPES.

WILD BEASTS AND THEIR WAYS.

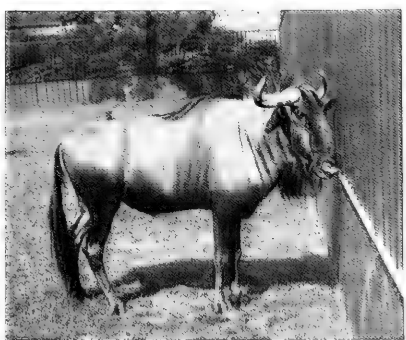
A series of articles on popular Zoology.

By Sir Harry Johnston, G.C.M.G.

III.—ANTELOPES (Part III.)

Illustrated with original drawings, paintings, and photographs by the Author and others.

THE *Bubalinæ* are a well-marked sub-family of antelopes which include the gnus, the hartebeests, and the topis.* These animals are among the most specialised of the antelopes in certain directions, but it is difficult to say which of the three sections into which they are divided is the least specialised. The gnus retain the primitive four teats, but have acquired horns which differ in type from those of all other antelopes. They have also developed much-expanded muzzles and disproportionately large heads. In the hartebeests the horns retain the annular ridges, and in the topis they are of more normal gazelline type, not unlike those of the smaller species of cobus; but in all these forms there are only two teats. The hartebeests, some species of which offer approximation to the gnus in the shape and direction of the horns, have developed exaggeratedly long and narrow heads. But for their reduced *mammæ* (only two) they might be the ancestors of the gnus. The only outside antelope which offers any marked resemblance to the bubalines is the pallah, the horns of which might very well have been the original type from which, by a process of concentration and shortening, the peculiar types of horns in the hartebeest, gnu, and topi might have been developed. But to account for the four *mammæ* of the gnu, the ancestral and allied types of the original bubalines must have had four teats; the pallah has only two. Moreover, the pallah has lost the anteorbital gland or tear bag, which, though small, is present in the bubalines; and the pallah has molar teeth more of the type of the gazelle, while the molar teeth in the bubalines have tall, narrow crowns. On the whole the present writer is disposed to think that the pallah is a much-specialised descendant of a cervicaprine type which in another direction gave rise to the topis, gnus, and hartebeests. It is stated that one of the existing hartebeests (Swayne's) occasionally possesses four *mammæ.* If this could be proved as a fact it would make it much more possible to argue that the hartebeests may have been the central stock from which the gnus developed in one direction and the topis in another. At the present time the least specialised hartebeest is Swayne's, and the least specialised topi is Hunter's antelope.† I would point out what has not hitherto been sufficiently noticed by naturalists, that the parent form of the bubalines possibly possessed a white chevron mark between the eyes across the forehead. This still lingers in Swayne's and the Cape hartebeests. It is strongly marked in Hunter's antelope (*vide* Illustration), and it reappears again in one form of gnu, the Nyasaland gnu, which was named after the present writer.‡



Photograph by C. Knight.
BRINDLED GNU (*Connochætes taurinus*).

* These animals are also styled Bastard Hartebeests, Bonteboks, Tsesébes, etc. Topi is an East African name applied to them which seems on the whole the most convenient to adopt, as it is not, like Bontebok given to a rather peculiar form.

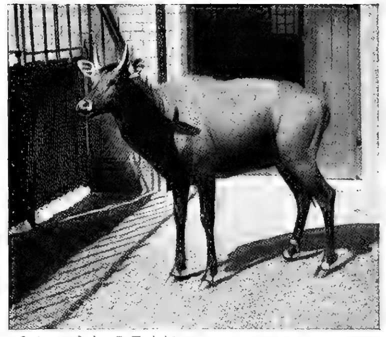
† *Damaliscus hunteri.*

‡ Though the first specimen was shot by Mr. H. C. McDonald.

The gnus (*Connochætes*) are really extraordinary animals, especially the White-tailed species, and it is little wonder that they were a great puzzle to the naturalists of the first half of the nineteenth century, whose classification was as a rule based entirely on external appearances. The hind quarters—and in the white-tailed gnu, the body—are shapely, and very much like those of a pony in build. In the less specialised Brindled gnu (*C. taurinus*) there is a disproportionate height at the withers which is accentuated by the thick and drooping mane which, together with the heavy growth of hair on the throat, jaws, and nose, gives the creature the aspect of a bison. The tail in the gnus is long and heavily tufted, the tuft in the white-tailed gnu (*Connochætes gnu*) being developed into a beautiful white plume which reaches from the tip of the tail nearly to the crown. In the brindled gnu (*C. taurinus*) the nose is perhaps broader, and the head longer and clumsier, than the white-tailed species. The horns are slightly less specialised. Their shape is illustrated by my drawing on page 203. This illustration is drawn from the skull of the white-maned brindled gnu of East Africa, which exhibits traces in its horns of the lost annulations. In the white-tailed gnu the boss at the bases of the horns is greatly exaggerated and flattened until it resembles a similar feature in the African buffalo, and in this animal the horns take a much stronger downward curve than in the brindled gnu. The white-tailed gnu has a brush of coarse bristly hair growing just above the bare surface of the nostrils. It has also a goat-like beard on the lower jaw, no mane along the throat, but a heavy growth of hair on the brisket and chest. There is also a hog mane along the ridge of the neck. The rest of the face and body is covered with fairly short hair, and the animal looks sleek and well groomed. In the blue or brindled gnu the mane along the ridge of the neck is almost as abundant as in the domestic horse. There is no growth of hair along the brisket, but continuously along the throat to the chin. The brush of hair along the forehead varies in growth in the different sub-species, but in all of them is confined to the upper part of the nose, and does not extend to the very edge of the nostrils. In the Nyasaland gnu this nasal brush is somewhat reduced in size, and gives place to the more conspicuous feature of the white chevron. In the gnu of British East Africa (*C. taurinus albojubatus*) the throat-mane is yellowish white, and white hairs also appear in the heavy mane along the neck. *Connochætes taurinus* is styled the brindled gnu from the vertical lines of differently directed hairs on the sides of the neck and body. The different set of the hair in these streaks gives the impression of dark grey stripes. Somewhat similar effects are seen on the neck of certain hartebeests. The ears in the brindled gnu are long like those of the hartebeests; they are shorter in the white-tailed gnu. The tail of the brindled gnu is almost covered with a plume of coarse black hair, and bears such a remarkable resemblance to a horse's tail that this detail, coupled with the horse-like mane and pony-like build, was sufficient excuse for the showman in the earlier type of menagerie to call the gnu the "Horned Horse." The distribution of the gnus deserves a little description. The white-tailed gnu is entirely confined to Africa south of the Zambezi, where it is almost extinct owing to a hundred years' slaughter at the hands of sportsmen, a slaughter which was intensified during the recent

Photograph by C. Knight.
WHITE-TAILED GNU (*Connochætes gnu*).

war. The typical brindled gnu is also found in South Africa, and its range extends thence somewhat capriciously across the Zambezi (where apparently it is only found in the eastern part of Nyasaland) to German East Africa, and perhaps as far north as Kilimanjaro and the south shores of the Victoria Nyanza. In Portuguese East Africa, inland from Quelimane and in the districts immediately east of the River Shire, the local form of the brindled gnu is known as the "Nyasaland," or "Johnston's" gnu, and, as already stated, differs from the typical brindled gnu by its white chevron and one or two other features. In the present writer's opinion, this is the only form of the black-maned brindled gnu which is found north of the Zambezi. The late Captain Speke shot a brindled gnu on the southern shores of the Victoria Nyanza which is identical with the gnu of Nyasaland. The specimen may be seen at Captain Speke's old home, "Jordans," near Ilminster. In British East Africa, to the north of Kilimanjaro and westwards as far as the east and south-east coast of the Victoria Nyanza, thence northwards perhaps as far as Lake Rudolf and even the southern frontier of Abyssinia, there is the white-maned sub-species of the brindled gnu. So far as is yet known no form of gnu has been found to the north of 5 degs. north latitude, or west of the Victoria Nyanza on the north, or the Kafue affluent of the Zambezi on the south.



Photograph by C. Knight.
MALE NILGAI (*Boselaphus tragocamelus*).

The hartebeests have a far wider range. They are evidently a very old type of antelope, and apparently once existed in India, where remains of a bubaline type have been found fossil. The bubal or northernmost type of hartebeest, which gives its name to the sub-family, was not only frequently mentioned by Greek and Latin writers, but is alluded to in the Old Testament, as it formerly inhabited Syria. At the present day the range of the hartebeests includes the southern portions of Morocco, Algeria, Tunis,* and Tripoli, and northern Arabia up to the confines of Palestine. In Western Africa a hartebeest (*Bubalis major*) is found in Senegambia, and in the regions of the Niger and the Cameroons outside the dense forests. Another hartebeest (*B. tora*) inhabits the Lake Chad region and the district lying between the northern affluents of the Congo, the eastern Benue, and Wadai. The Tora hartebeest also extends its range right across the Nile to the north of Abyssinia. In the regions of the White Nile and of the Nyam-Nyam country, and everywhere in the Uganda Protectorate outside the forests, also in the adjoining districts of British East Africa, the species of hartebeest is a well-marked type, named after its discoverer, Mr. F. J. Jackson (*B. jacksoni*). In this species the upward growth of the horns and the sharp backward turn of their tips is perhaps most exaggerated, as well as the extravagant length of the face. The colour of this animal is entirely red-gold all over, except that on the front of the limbs the golden colour turns to a darker brown. The range of this antelope probably extends into the southern part of Somaliland. To the east and south, however, its place is taken in British and German East Africa by Coke's hartebeest, a much less handsomely coloured creature of pale brown with a reddish rump, and with horns that turn outwards rather than upwards. I have noticed in the Rift Valley of East Africa that the range

* Of late years the hartebeest has become almost extinct even in the south of Tunis, and if met with at all in the political limits of that country it would only be in the region which possesses some vegetation and lies between the dried-up salt lakes and the sands of the desert.

of Jackson's hartebeest meets that of Coke's hartebeest, and Mr. Doggett and myself and several other people have shot hartebeests which would appear to be hybrids between the two. Coke's hartebeest merges in British Central and Portuguese East Africa into Lichtenstein's hartebeest (*B. lichtensteini*), very similar in coloration to Coke's, but whiter on the rump and redder on the line of the back and forehead, and with horns of distinctly different aspect. The horns of Lichtenstein's hartebeest have in the male a very broad, flat, frontal boss, and are then tightly twisted inwards, outwards, and backwards. South of the Limpopo River and northwards across the Kalahari Desert into the southern regions of Angola dwells in rapidly decreasing numbers the beautiful Cape hartebeest, a gorgeously coloured antelope with a white chevron across the forehead interrupting a jet black line from the base of the horns to the nostrils, a black patch above and below the eye, white ears, a black ridge to the neck, black patches on the outer sides of the front and hind limbs, and a pure white blaze on the hind quarters, with another white touch on either knee and on the belly. The tail is black, and the whole of the rest of the form is red-gold. One would have thought such beauty of colour, combined with a form more graceful than that of the other hartebeests, would have prevailed with the politicians of the self-governing colonies to secure effective protection for this beautiful form. It has not, however, and in common with all the other South African antelopes this species is on the point of extinction. If it is saved at all it will be from the fact that it fortunately inhabits part of Portuguese South-West Africa. In Somaliland there is the remarkable Swayne's hartebeest, which is perhaps the hartebeest most nearly allied to the gnus. This creature is mainly a dark umber brown on the upper parts, with pale yellowish lower limbs. The fore limbs are boldly marked on their upper parts with black, and there is also a black frontlet and a black nose. In all the hartebeests the tail is fairly long (though not so long as in the gnus), and is plumed only along the lower part of its outer edge.

The topis (*Damaliscus*), with one exception, are extremely handsome in coloration. That exception is the rather aberrant Hunter's antelope, found, like so many other curious types, in Somaliland and the northern part of British East Africa. This animal has a white-plumed tail (plumed only along the *inner* aspect, not the *outer*, as in the hartebeests), white ears, and a white chevron mark across the forehead. It is elsewhere a monotonous buff colour. I have already alluded to its rather remarkable pallah-like horns. The other topis have horns of a shorter and simpler kind, rather like those of the smaller cobus antelopes. In South Africa, East Africa, and thence right across the Lake Chad regions to Senegambia there is a well-marked group of *Damaliscus* or Topi antelopes which are remarkable for their sleek satin-like coats of a deep red (almost inclining to mauve in parts), marked more or less vividly with black on the forearm, hind quarters and forehead. The legs are generally yellow, and there is often a touch of white on the abdomen. The ears are long and white. The tail, like that of the hartebeests, is plumed with black on the outside of its lower part. This type of *Damaliscus*, known as korrigum, tiang, jimela, and sassaby (tsesébe), is found practically all over tropical Africa south of the Sahara Desert, outside the dense forests and away from the more arid deserts. South of the Zambezi, however, the sassaby is very nearly extinct. In Cape Colony there still exist in a single farm near Bredasdorp

Photograph by W. P. Dando.
BUSHBUCK (*Tragelaphus sylvaticus*).

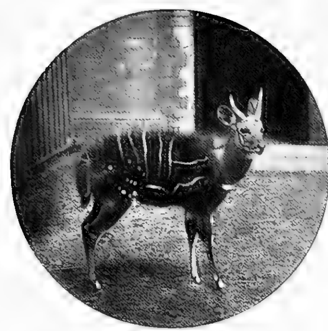


Photo by W. P. Dando.
HARNESSED ANTELOPE (*T. scriptus*).

a few specimens of the nearly extinct *Damaliscus pygargus*, or Bontebok. Formerly this handsome antelope ranged over much of South Africa south of the Vaal River. Its forehead and nose, right down to the nostrils, its rump, belly, and parts of its limbs, its ears, and the upper part of its tail are snowy white, the rest of its coloration being black and whitish-grey, with touches of yellow. The closely allied blesbok (*D. albifrons*) has the same white blaze on the nose, but less white about the limbs, and none on the hind quarters. It inhabits the northern parts of South Africa where it exists at all.

We now come to the consideration of the *Tragelaphinæ*, which are a totally distinct group from the true antelopes, and much more nearly related to the cattle. In all these creatures the nose and muffle are naked and wet, as in cattle, the ears are broad rather than long, are like those of cattle in shape, and the interior is never filled up with hair as in most of the true antelopes, a fringe of long hair only growing (as in the cattle) from the inner and outer edges. All of them tend to be more or less spotted and striped with white, the most permanent of these white markings being two large spots on the cheeks, a white line round the nostrils and upper lip, a white patch under the chin, round the lower part of the throat, and on the feet just above the hoofs. When white markings appear on the more primitive types of cattle it is in the same places. The original type of horns in the tragelaphs tends to be of a rather three-cornered structure, with a well-marked ridge in front. The horns are entirely without the regular annular ridges of the antelopes, capricorns, goats, and sheep; but the longitudinal outer ridge formed by the original three-cornered structure of the horns has a tendency to persist even where the horn in its development has become rounded. A marked feature of the tragelaphine horns is their spiral structure. This is but feebly indicated in the Nilgai of India, a creature which it is, perhaps, advisable to make into a sub-family by itself, although it has considerable tragelaphine affinities. But even in the nilgai horns (which are very short in comparison to the great bulk of the animal) there is the beginning of a spiral twist. Several of the tragelaphs develop in the male a throat mane. This in the nilgai is reduced to a single tuft. In the eland it is more restricted than in the kudu, and is combined with a great development of dewlap, another ox-like feature. There is also a tendency to develop manes along the ridge of the neck, and also (much more so) along the line of the back. In the larger tragelaphs, except the bushbucks and inyalas, the tail is long and bovine (though rather bushy in the kudu). In the bushbucks it is shorter and broader. In most of the inyalas it is fairly long, but flat and broadly clothed with hair.

The nilgai (*Boselaphus*) inhabits the whole peninsula of India south of the Himalayas. It is a large animal, almost the size of an ox, but standing much higher at the withers than at the hind quarters. Its molar teeth resemble those of the oxen more than they do the shorter-crowned, simpler teeth of the tragelaphs. The male alone bears horns, and these, as already mentioned, are disproportionately small, never reaching as great a length as twelve inches. The horns at their base are triangular, but have become rounded towards the slightly re-curved tips. The horn cores, however, rise much nearer to the orbit than is the case with the oxen. (A slightly intermediate type is met with in the buffaloes, in which also the shape of the skull and relative length of the nasal bones are a little more like the boselaphine type.) On the whole, the nilgai is the most

ox-like of existing cavicorns outside the bovine sub-family; while the most primitive of existing oxen is the little anoa of Celebes (see page 211). In this animal the horns are triangular in section, somewhat flattened, perfectly straight and directed backwards, with perhaps vestiges of annulations. Some of the heavier capricorns also come very near to the bovine type, and as from these are obviously descended the sheep and goats and the musk ox, this basal position of the capricorns may possibly explain resemblances to the bovines in the sheep. On the whole, the most primitive of the Cavicorns at the present day are the Cephalophine and Neotragine antelopes, the Nilgai, the Buffaloes, and perhaps certain Capricorns.

The tragelaphines proper are confined in their present range of distribution to Africa south of the Sahara, but they were formerly found in southern Europe, northern Africa, and western Asia, thus connecting their range anciently with the present distribution of the Nilgai. With the exception of the eland bongo and northern kudu, horns are present *only* in the male. As already mentioned, their horns are distinguished by their spiral growth. This is least developed in the genus *Tragelaphus*, where there are barely two turns—sometimes only one and a-half. In one species of *Limnotragus* there are two and a-half turns, as is also the case with the eland. In the adult horns of the kudu there are three turns. Their molar teeth have short crowns, and only exhibit in the upper jaw a beginning of the accessory column which is met with in the oxen and in the nilgai. They are divided at the present time into the genera of *Tragelaphus*, *Limnotragus*, *Strepsiceros*, and *Taurotragus*. The genus *Tragelaphus* includes a great many species, fresh ones being constantly discovered in the opening-up of Africa. At present there are at least seven. These include the relatively small bushbuck of South and East Africa, and the beautifully-painted Harnessed antelope of West and Central Africa (in which the white tragelaphine markings almost attain a maximum of development), the splendidly handsome Inyala (*Tragelaphus angasi*), which ranges in its scattered distribution from Zululand up the region of the Great Lakes possibly to near the Victoria Nyanza, and the bulky, Broad-horned tragelaph or Bongo (*T. euryceros*) of the forest region of West Africa and of the Uganda Protectorate. The ground colour of the tragelaphs of this genus is a golden red-brown, which is the colour always exhibited by the females and young, with bold markings in black and white. In the females of many species there is a sharply-drawn jet black line all down the centre of the back, from the nape of the neck to the tail. This line in the broad-horned tragelaph is half black (along the withers) and half white in the male. In the inyala it becomes nearly white throughout in the male, but expands into a broad black streak from the base to the tip of the tail. Most of these antelopes have the chevrons of white from the corners of the eyes across the base of the nose. The tendency of the males, however, of most of the genera is to assume a much greyer or blacker coat when they reach maturity. The males of the South, and some of the East African bushbucks, almost entirely lose the tragelaphine spots and stripes when they reach maturity. There is a good deal of black also mingled with the red-brown coat of the beautiful harnessed antelope, a creature which ought positively to have a temple erected to it. Angas's tragelaph—the Inyala—is heavily maned all down the throat and along the sides of the body and hind quarters. The limbs in the male are a bright reddish-fawn, in abrupt contrast to the blue-grey and black body and mane and the vivid white markings

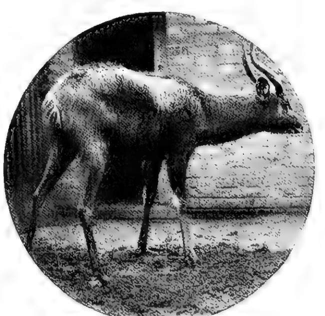


Photo by W. P. Dando.

SELOUS' TRAGELAPH
(*Limnotragus selo si*).

which are still retained. The coat of the adult broad-horned antelope in some districts tends to become a warm chocolate-red, tipped here and there with black; elsewhere it remains reddish-yellow. But it is distinguished from the other members of the genus by having no spots, except on the lower jaw, and a regular succession of longitudinal vividly-marked white stripes. This antelope also has a long tail, whereas other members of the genus *Tragelaphus* have shorter and more tufted appendages.

The inyalas or large bushbucks lead, by the transitional form of the Pleasant tragelaph (*Limnotragus gratus*) of West Africa, to the extreme types of water-dwelling tragelaphs which constitute the other two species of the genus *Limnotragus*. The Pleasant tragelaph of West Africa is an animal the size of a mule, with long legs, horns like an inyala, and a long silky coat of dark chocolate-brown in the male and reddish-yellow in the female. The coat of the male is diversified with white spots and stripes very much like the markings of an inyala, and there are bold white markings also on the delicately-shaped limbs. The hoofs of this animal are slightly prolonged, but not to the same extent as in the next two species. *Limnotragus spekei* is the water tragelaph of the Victoria Nyanza and the adjoining lakes and rivers. This creature still retains, even when adult, a few of the tragelaphine white markings, though they are very faint. The young are a reddish-yellow in colour, with fairly distinct white stripes and spots. The adult males attain very long weedy-looking hair of a kind of chocolate-grey. This animal also has horns like an inyala, but, perhaps, proportionately larger. It is about the size of a big mule. The toes are very long and the hoofs are considerably prolonged, while the false hoofs are also well developed. Behind the false hoof is a curious piece of stiff cartilage which resembles a smaller hoof. Very similar to this is *Limnotragus selousi*, the water antelope of the upper Zambezi and of Lake Mweru. It is said, however, that in this animal even the young have lost the spots and stripes. A good living example of this, here illustrated, may be seen in the Zoological Gardens at the present time. In this animal the horns when at their full growth have two and a-half turns, and somewhat resemble in appearance those of the kudu. These water-dwelling tragelaphs are not as exclusively aquatic in their life as has been thought by earlier writers. They can and do immerse their bodies in the water and the water vegetation to conceal themselves from enemies, and they frequent the water a great deal, while their great development of hoofs enables them to traverse swamps and floating vegetation. At the same time, they are active on land, and take tremendous leaps, and—as may be seen in the Zoological Gardens—can accustom themselves very cheerfully to life on dry soil.

From a Photograph.

YOUNG OF SPEKE'S TRAGELAPH (*Limnotragus spekei*).

The kudus (*Strepsiceros*) are almost, if not quite, the highest expression of the tragelaphs. In them the graceful spiral horns take, when mature, three complete turns. The smooth, silky coat is beautifully marked with thin white stripes. There are no spots on the body, but white spots and chevrons and gorgets appear on the face and neck. The male has a throat-mane of long hair, which grows only along a narrow line exactly in the centre of the throat. There is also a dorsal mane along the ridge of the neck and back. The tail is long and bushy. The kudu is about the size of a small ox, but longer legged and more gracefully built. These animals are still found in South Africa, between the Zambezi and the Limpopo, and perhaps also in Zululand. North of the Zambezi they range into Portuguese South-West Africa, and northwards

to the verge of the Congo Forest, and up through German and British East Africa to Somaliland and the southern and western parts of Abyssinia. They have never been reported from countries to the west of the Victoria Nyanza or to the west of the White Nile. In Somaliland, and thence southwards to the River Tana and westwards to the vicinity of Lake Baringo, is found the Dwarf kudu (*S. imberbis*), which differs but slightly from other species, except that it is scarcely more than half the size. It would seem almost to be a local variant of the kudu rather than an ancestral type. Amongst the other tragelaphs the nearest relation to the kudu apparently is the broad-horned tragelaph (*T. euryceros*).

The elands (*Taurotragus*) would also seem to be a special development of the kudu type in which the horns have become thickened and concentrated while retaining almost the same number of turns. Curiously enough, the eland has been unconsciously aiming at getting out of the spiral-horned condition, and the general effect of its horns at a distance is to suggest their being perfectly straight and carried backwards in a continuous line with the profile of the nose. In the Derbian eland (*T. derbianus*), which is a forest-haunting animal, and found in the forests of West Africa from the eastern boundaries of the Congo Free State to Sierra Leone, the horns attain considerable length by an extra growth of the terminal, untwisted portions. In this animal also the tips of the horns diverge considerably from one another, whereas in Livingstone's eland of South-Central Africa the tips tend to converge. The eland differs from all the other tragelaphs in that both male and female carry horns,* the horns of the female being naturally much more slender than those of the male, though even longer. The South African eland, when adult, tends to lose entirely all tragelaphine white markings, though they reappear in the young and are sometimes retained by the adult female. The body colour of the adult male South African eland becomes in general an ash or bluish-grey, with a black bar across the forearm. There is a considerable development of coarse, bristly hair in a brush down the ridge of the nose. The ears of the eland are longer, narrower, and finer than in the rest of the tragelaphs. The development of dewlap is sometimes excessive, and the dewlap is often furnished with a coarse and partial throat-mane. The tail is long and tufted like the tail of an ox. In Livingstone's eland, which is only a sub-species of the South African form, the colour of the adult males is often a reddish-buff or pale brown, and the white stripes are generally retained throughout life in the adult animals. Under these conditions the eland is seen to be striped very much like the kudu, and to have no white spots on the body, only on the cheeks. The Derbian eland is a distinct species, which is very black and very hairy about the head, neck, and fore quarters, and yellowish-brown (with some white) about the rest of the body, and very distinctly striped. It is, perhaps, the biggest of the elands and the tragelaphs, and is equal in size to a large ox.

Photograph by York & Sons.
THE ANOA BUFFALO (*Bos depressicornis*).

Some of the more striking genera of modern antelopes appear to have been represented by allied forms hundreds of thousands of years ago in India, Persia, Asia Minor, and Southern Europe. Gazelles were found in England, and many forms of them were met with in Southern France and Greece. A creature closely resembling

* Though Mr. H. H. Baker has since reported the existence of horns in the female kudus of the Baringo District, East Africa.

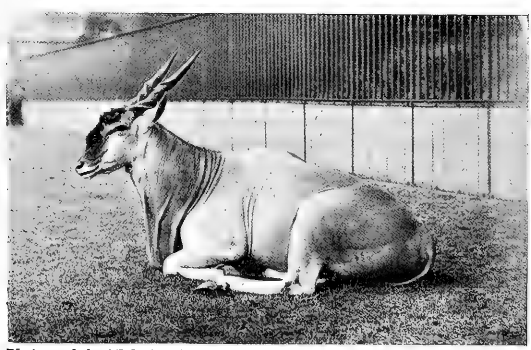
the springbuck of South Africa once existed in Persia. In India remains have been found of primitive cervicaprines. It is said that some of the remains of antelopes in Southern France would appear to indicate a neotragine form akin to the klipspringer. In Germany there are fossils indicating a type of antelope which might be a primitive hippotragine, while something very like the roan antelope is found fossil in India. Other creatures more like the oryxes existed in Greece, Italy, and Southern France. There were also in India types related to the hartebeests.

Tragelaphine forms like the kudu have been found fossil in North-Western India and in Algeria, and perhaps in Persia and the Island of Samos. Another creature, which has been named *Palæoreas*, and was also tragelaphine (very like the dwarf kudu, in fact), has left its remains in Greece, Southern France, Samos, and Algeria, while other and more vague tragelaphine types are found fossil in Southern Germany.

I might close these two articles by a few hints to sportsmen and naturalists who are travelling in Africa as to points which want clearing up in the classification of the antelopes. The soft parts (that is to say, the musculature, the internal organs, etc.) of the cephalophines are by no means sufficiently known. In dissecting these little antelopes every search should be made for the existence of a gall-bladder, which has hitherto been thought to be absent from all the members of this sub-family. It would be interesting also to show conclusively that in one or more forms of cephalophine there were traces of the upper canine teeth in mature males. Every species of cervicaprine (kob, reedbuck, etc.) should be examined for traces of the vanished anteorbital gland (tear bag). All hartebeests, topis, and pallahs should be examined to ascertain the number of *mammæ*. It would be very interesting if it were found that any true hartebeest, topi, or pallah developed four *mammæ*.

More information might be collected as to the horns of the addax antelope. It has been stated somewhat vaguely by some French travellers that there are forms of the addax in the vicinity of the Upper Niger in which the horns have but slight spiral twists, are thicker, and a little more like those of the roan antelopes.

In collecting skulls of all the little-known antelopes great care should be taken of the molar teeth, both in the lower and the upper jaw, as the shape, length, and structure of these teeth are important in classification. The same thing may also be said about the bones of the skull, which so rarely arrive in a perfect condition. It would also be interesting to obtain specimens of the young soon after birth in all the cephalophine antelopes, with a view to discovering if any of these forms showed in their very young stages traces of the white spots and stripes so characteristic of the primitive ruminants.



Photograph by W. P. Dando.

THE ELAND (*Taurotragus canna*)

H. H. Johnston

[In the next number of Animal Life will appear an article by Mr. F. C. Selous entitled "An African Game Haunt of the Past."]

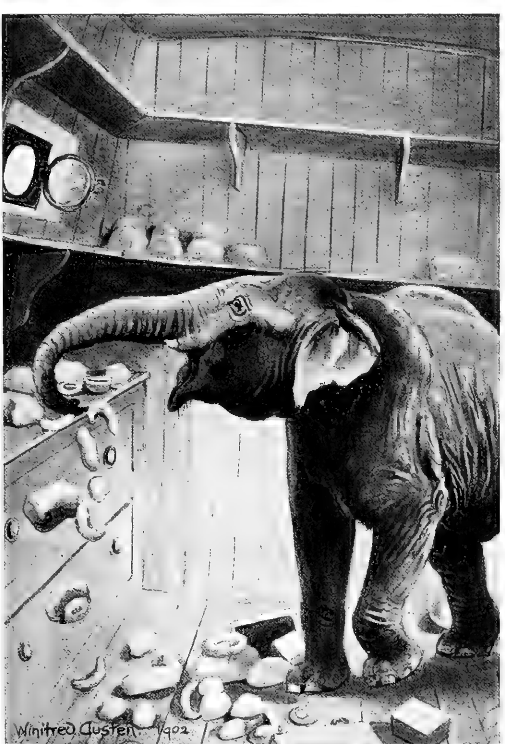
ANIMAL ANECDOTES.

A Moral Victory.

AMONG the many animal presents received by Queen Victoria was an elephant which, when a mere baby, was sent to her by an Indian prince. He travelled as a deck passenger on one of the Indian mail steamers from Bombay, and as he had attained but the height of a well-grown calf and was always docile and tractable, he was allowed to have the run of the decks for an hour or two every morning.

Among other acquaintances that he formed while on board ship was that of the ship's baker, whose galley he soon discovered to be the place of origin of all the sweet dainties with which he was fêted. Here he took to making a regular morning call, and was generally regaled with a tart or piece of cake.

But one morning when he called and extended his trunk as usual, the cook happened to be in ill humour, and instead of a cake the elephant received a tap on the trunk from the rolling-pin.



With a few vigorous sweeps of his trunk the elephant cleared every shelf in the bakery.

The blow was not severe, but the elephant turned tail and went trumpeting up the deck, where he took a position that enabled him to watch for his assailant.

Before long he saw the baker leave his "shop," and having apparently made up his mind what to do, he promptly marched down and with a few vigorous sweeps of his trunk cleared every shelf in the bakery. Loaves, tarts, cakes, patty-pans and cake-tins lay in a confused heap on the deck. This achieved, he bolted like a mischievous schoolboy, and was locked up in disgrace; but when the circumstances became known the popular verdict was in his favour and he was allowed his liberty as before.

No sooner was the animal set free again than he marched down to the baker's, and from that day he never failed to exact his tribute. It was regularly paid, and he and the baker became the best of friends.

A Clever Rogue.

A FARMER'S dog was extremely fond of biscuits, and had been taught by his owner to go after them for himself, carrying a written order in his mouth. Day after day he appeared at the chandler's shop, bringing his master's order, and by-and-by the shopman became careless about reading the document. Finally, when settlement day came, the farmer complained that he was charged with more biscuits than he ordered. The chandler was surprised, and the next time the dog came in with a slip of paper between his teeth he took the trouble to look at it. The paper was blank, and further investigation showed that, whenever the dog felt a craving for a biscuit, he looked around for a piece of paper and trotted off to the shop.

ZOO NOTES.

Described and Illustrated with Photographs by W. P. DANDO, F.Z.S.

OURANG-OUTANG.

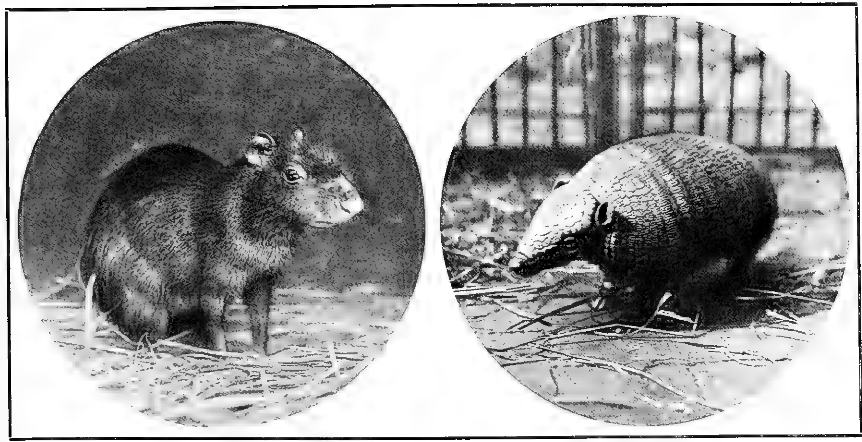
Death of the Ourang-outang.

IT is really regrettable to have to announce the death of the only surviving specimen of the Ourangs which were deposited in the new Ape House. The animal had not been on the sick list many days before it died from congestion of the liver (a disease which mostly takes off these apes), and not an affection of the lungs, which is the cause of more mortality among monkeys than any other disease. This ourang was never a healthy specimen, and his death, following so soon after that of his companion and the loss of the proboscis monkey, is most unfortunate. It is to be hoped they will both soon be replaced by more robust specimens, as nothing more attractive than a really robust and lively adult ourang could be found for the new Ape House, except, of course, an adult gorilla, which would indeed be a great attraction.

Indian Isabelline Bear.

THE stock of bears at the Zoo is a large and varied one, and is made up chiefly by donation. Many travellers bring home with them pet baby bears, but as they advance in age they grow less tractable, and when full grown lose their good temper altogether and become dangerous; then they are hurried off to the Zoo. In an article in the French Encyclopædia ("Chant") the history of an unmusical procession at Brussels is narrated. A part of the show consisted of a car, in which was an organ played by a bear. Instead of pipes, the instrument contained a collection of cats, each confined separately in a kind of narrow case so that they could not move; but their tails were held upright and attached to the jacks in such a manner that, when the bear touched the keys, he pulled the tails of the parties enclosed and produced a most mellifluous mewing and wailing, in the C clef we suppose, treble, counter-tenor, etc. The organist himself, perhaps being invited by the same machinery, utters a bass accompaniment.

ISABELLINE BEAR.



PUNCTURED AGOUTI. HAIRY ARMADILLO.

Punctured Agouti of Central America.

THE Agouti, which is the South American native name accepted as the English appellation for the South American and West Indian rodents, belongs to the genus *Dasyprocta*; another designation applied to some of them being Cavy. The animal is nearly two feet long, covered with brown hair sprinkled with yellow or reddish, except the crupper, which is orange; the ears are short, and the tail rudimentary. Darwin, in his "Origin of Species," Chap. IX., writes:—"On these same plains of La Plata, we saw the agouti and bizcacha, animals having nearly the same habits as our hares and rabbits and belonging to the same order."

The Hairy Armadillo.

LIKE the rodent just described, the Armadillo is also a native of La Plata, and a more restless animal it would be difficult to find anywhere in the whole Zoo. It is always on the move with a motion very rapid for the size of the animal, which must cover miles of ground in its daily marches, and its armour-clad body, from which its name is derived, does not in any way seem to impede its very rapid movements. These animals are remarkable for the number of

SPOTTED HYÆNA.

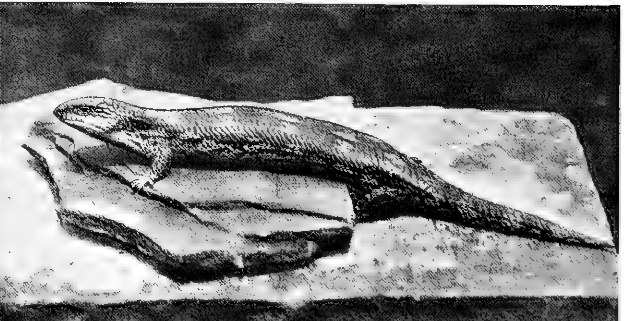
STRIPED HYÆNA.

their teeth—over ninety. Their fore feet are specially adapted for digging, and the animal, when it sees danger, can extemporise a hole and vanish in it with wonderful rapidity and, like the common wood louse, will, if captured, roll itself into a ball, withdrawing its head and feet under its strong armour.

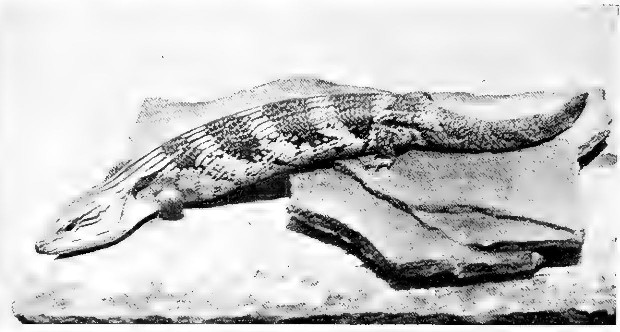
BLACK POINTED TEGUEXIN.

Spotted and Striped Hyæna of S. Africa.

THE Common Striped Hyæna was the only species that was known to Linnæus, and was named by him *Canis Hyæna*. The recent species, however, number four. This animal was known to the Ancients, who regarded it with superstitious awe and invented many stories as to its habits (which are nocturnal), such as those of grubbing up corpses from graveyards, hunting down animals, or, in some cases, carrying off children. Moore calls its cry a "moan," but sometimes there is a cry like sardonic laughter, whence the animal is called the Laughing Hyæna. No words can give an adequate idea of this animal's figure, deformity, and fierceness. More savage and untamable than any other quadruped, it seems to be ever in a rage, and, except when taking its food, ever growling. Its eyes then glisten, the bristles on its back all stand upright, its head hangs low, and yet its teeth appear, all of which give it a most frightful aspect, which a dreadful howl tends to heighten; its beginning



BLACK AND YELLOW CYCLODUS.



BLUE TONGUED CYCLODUS.

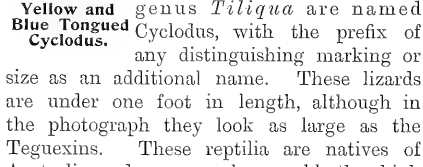
resembles the voice of a man moaning, and its latter part as if it were making a violent effort to vomit. As it is loud and frequent, it might, perhaps, have sometimes been taken for that of a human voice in distress, and have given rise to the accounts of the Ancients, who tell us that the hyæna makes its moan to attract unwary travellers and then to destroy them; however this may be, it seems the most untractable and, for its size, the most terrible of all the quadrupeds. Nor does its courage fall short of its ferocity; it defends itself against the lion, and seldom fails to conquer. The spotted variety is also given as an illustration, its habits being similar to that of the striped; it is somewhat smaller, and is found nearer the Cape, hence it is often called the Cape Hyæna. Another nick-name it enjoys is the "Tiger-Wolf."

COMMON SKINK.

CUNNINGHAM SKINK.

Black Pointed Teguexin.

Yet another extraordinary creature from South America, in the shape of one of the Lizard family, known by the native name of Teguexin. These lizards are found in sugar plantations and among scrub and bush, and can swim well, but do not take readily to water. They measure from three to four feet long and seem very ferocious, the one photographed being quite snappish. The legend that they utter a warning sound on the approach of wild beasts (whence they are sometimes called Safeguards) is apparently without foundation.



Black and Yellow and Blue Tongued Cyclodus.

Australia furnishes us with a great variety of lizards, and those of the genus *Tiliqua* are named Cyclodus, with the prefix of any distinguishing marking or size as an additional name. These lizards are under one foot in length, although in the photograph they look as large as the Teguexins. These reptilia are natives of Australia and very much resemble the skink in appearance. They are quite harmless, and when placed in a position remain for several minutes as immovable as the stone upon which they lie; at least, this was my experience.

Skinks.

The Skink tribe is a very numerous one, comprising upwards of thirty-five genera and nearly four hundred species, the Common kind coming from South Europe, and Cunningham's from Australia. The name "Common" is derived from its having been extensively employed as an infallible remedy for almost any disease under the sun, and its reputation as a healing agent still survives among the Arabs, who use the flesh both as an article of food and as a drug. According to Canon Tristram, the flesh of well-broiled skinks forms a dish not to be despised even by an European palate. Frogs and snails many of us have eaten, I won't say (for myself) with a relish, and no doubt devilled skink would make a good *entrée* with Egyptian sauce.

NOTES AND COMMENTS.

The Mistletoe.

OUR coloured plate this month is a reproduction from one of Professor Hulme's fine paintings of our British Wild Fruits. Appropriately to the season, the one chosen is the mistletoe. We wish we had the space to quote at length what the artist-author so interestingly tells us about this plant; for example how, until quite recently, it enjoyed a big reputation for medicinal properties, especially as a specific for epilepsy. As a parasite, too, it possesses many curious peculiarities, amongst others the fact that it is the only plant whose roots refuse to shoot in the ground; this, and its traditional superstitions handed down from the days of the Druids, add a great deal to its charm. Herrick, full of quaint fancy, finding ever valuable lessons in the commonest and most unlikely things, sees in the mistletoe a beautiful emblem of his dependence upon the care of Providence:

> "Lord, I am like the mistletoe,
> Which has no root and cannot grow,
> Or prosper, save by that same tree
> It clings about; so I by Thee."

We cannot for want of space make further extracts, so must content ourselves with the opportunity afforded of commending to all lovers of nature this first volume, under the Duke of Bedford's editorship, of the Woburn Library—"Wild Fruits of the Country Side." It is a rare pleasure to come across such a handsome book (and withal so cheap), and we gratefully acknowledge our obligations to the publishers, who have kindly allowed us to reproduce this handsome plate.

Our Poultry.

WE are glad also to have the opportunity of saying a word in praise of Mr. Harrison Weir's great work, "Our Poultry, and All About Them: Their Varieties, Habits, Mating, Breeding, Selection, and Management for Pleasure and Profit." This is now coming out in fortnightly parts, price 7d. net, the two first of which have just been published. We can thoroughly recommend this work to all who are in any way interested or concerned in the management of poultry. The letterpress bears evidence of the author's full practical knowledge, while the wealth of illustrations, mostly by the author, make the work certainly the most attractive on the subject that has come under our notice. When completed, the book will contain at least 250 illustrations, including 36 coloured plates reproduced from the author's original paintings, besides a number of photographs specially selected. The coloured plates are a most striking feature; indeed, we have no hesitation in pronouncing them the most effective examples of colour printing that have yet appeared. Our illustration is from the third part of "Our Poultry." The public should be duly grateful for the opportunity afforded them by the publishers of obtaining such a handsome work on the popular instalment system. Even so, it is wonderful value for the money.

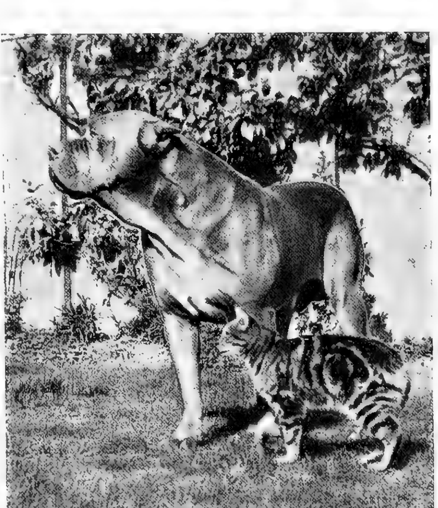
BLACK HAMBURGH HEN.
From "Our Poultry."

Dogue de Bordeaux.

A NOBLE breed of ancient lineage is the Dogue de Bordeaux; but alas! the anti-cropping edict has killed it in this country, for it cannot be denied that with his natural ears

BORDEAUX BITCHES.
"Dragonne" and "Diane."

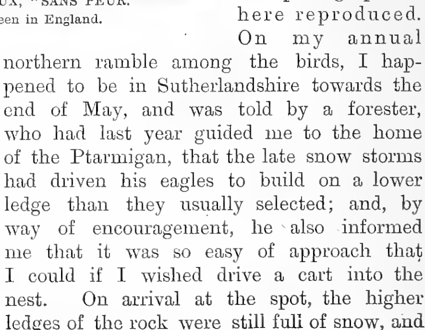
on he does not look handsome. This is the old French dogue, to which Gaston Phœbus, Comte de Foix, referred centuries ago. In the South of France and on the Spanish border these dogs were, and still are, kept for gladiatorial purposes, being matched against each other and also against wolves, bulls, bears, and asses. A savage stallion ass is said to be the most terrible opponent for the dogue, for it strikes down its foe with its fore feet and then tramples on him or worries him. A professional fighter has frequently to be led between two men, as no ordinary man could withstand the fury of his rush if he wished to attack. The first person to exhibit a dogue in England was Mr. H. C. Brooke, who imported all the best. Our portraits are those of "Sans Peur" and of his mother and sister "Dragonne" and "Diane," all winners of many prizes in France and England. These dogs had never been trained for the arena, though they were descended from "Hercules," surnamed the "Terrible," who, after a glorious career, was killed at San Francisco, after a fearful fight, by a jaguar. Another specimen Mr. Brooke owned was by him pitted (in this country) against a large Russian bear, whom he threw three times, displaying great sagacity in avoiding the bear's hug. This dog was a descendant of "Caporal" ("The Invincible"), for seven years the champion of the Pyrenees, and of "Mina," who had fought bull, bear, and hyæna.



DOGUE DE BORDEAUX, "SANS PEUR."
The best Dogue seen in England.

The Golden Eagle at Home.

Mr. J. T. Proud, of Bishop Auckland, who has kindly given permission for the reproduction of the two photographs on page 221, writes:—"It must be a source of gratification to ornithologists to know that this lordly bird still holds its own in the secluded deer forests of the far north, and the lover of nature who is not filled with delight when for the first time he sees the Eagle circling the mountain top is not worth the name. Although the keeper, whose sole care is Grouse, wages a constant war against them, the forester, whose interests are allied with those of the red deer, and who would prefer not to have a grouse on his "March," not only allows them a sanctuary, but affords them a certain amount of protection in some out-of-the-way rocky glen where they may construct their rude rough nest of heather stalks and goose grass and rear their brood (if two, sometimes only one, and rarely three, can be called a brood) in peace. The only eyrie I had the pleasure of visiting this year contained but one eaglet, and his photograph is here reproduced. On my annual northern ramble among the birds, I happened to be in Sutherlandshire towards the end of May, and was told by a forester, who had last year guided me to the home of the Ptarmigan, that the late snow storms had driven his eagles to build on a lower ledge than they usually selected; and, by way of encouragement, he also informed me that it was so easy of approach that I could if I wished drive a cart into the nest. On arrival at the spot, the higher ledges of the rock were still full of snow, and



GOLDEN EAGLET IN NEST.

the birds had certainly been considerate in choosing an undoubtedly easy site, but, as I experienced some little difficulty in obtaining suitable accommodation in it for my camera, I did not care to test the adaptibility of the approaches for vehicular traffic. My first attempt to photograph the nest was doomed, as, no sooner had I got the camera satisfactorily fixed, than a blinding snow storm came on; and after clinging to the rock with one hand and the camera legs with the other for over half an hour, by which time I was well covered up and the nest had a couple of inches of snow in it, I had to abandon it. The little eaglet screamed most piteously in the storm; and although I several times saw the parent birds overhead, and his cries must have reached them, they never approached within a hundred yards, which quite satisfied me that the golden eagle will not under any circumstances, while at large, attack man. I was not sorry when the storm abated sufficiently to allow me to get down and start a somewhat dreary tramp of five miles to the hotel; but I determined to try again, and two days later I revisited the eyrie under more favourable conditions. On that occasion the larder had been replenished with a freshly-killed and neatly-plucked grouse, which may be seen at the back and to the left of the photograph of the eaglet, whilst to the right of it are the remains of a ptarmigan, and in front the skins of two young mountain hares. I am afraid I am disclosing facts which

AT THE EYRIE.

TOY BULLDOG.
Lady Kathleen Pilkington's "Ninon de l'Enclos."

may at some time be made use of by some grouse preserver to the disadvantage of the eagle; but when speaking on the subject not long ago to a keeper of the right sort, who could always show his master good sport, he said, 'It's a poor moor, sir, that can't afford to keep a pair of eagles,' and I trust that every true British sportsman who is fortunate enough to have a pair of eagles on his ground will agree with that statement, and that the day is far distant when the king of British birds shall have ceased by his presence to add interest to the wild grandeur of our northern highlands."

The Toy Bulldog.

A VERY charming specimen of a charming breed is Lady Kathleen Pilkington's "Ninon de l'Enclos," who is the best of her sex in England. The toy bulldog must not exceed 20 lbs. in weight. Most of the toy bulls come from France, although there is no doubt that they are originally of English descent. Some forty or fifty years ago a very large number of small English bulldogs were imported to France, where they flourished long after the fashion in England had demanded heavier weights. The bat or erect ear prized in France is now not admissible in the English bulldog, though formerly many English winners had erect ears. Quite recently a French bulldog club has been formed to foster the bat-eared dogs, and the question, French bulldog or not French, is being fought out with great ill-feeling, it being in fact the burning doggy question of the hour, and having resolved itself into a triangular duel between the bulldog men, the French bulldog enthusiasts, and the toy bulldog people. The French bulldog is allowed to go up to 28 lbs., and a fair representative of the breed is "Bibi," Mrs. Walter Jefferies' dog, whose portrait we give. *En passant*, we may say that the French bulldog is by no means deserving of the sneers cast at him by some bulldog men who revile him as a coward, for it is a fact that these little creatures used to be the "business" or fighting dogs of the Brussels workmen; and on the other hand it is not to be denied that *some* of the degenerate bulldogs of the present day are terrible cowards—*some* not all.

FRENCH BULLDOG.
Mrs. Walter Jefferies' "Bibi."

A BULLDOG THAT SOLD FOR £1,000.

Bulldog "Rodney Stone."

ONLY a few years, some five or six, ago, one hundred and fifty or two hundred pounds was considered

an enormous price to give for a bulldog, although curiously enough this price had been obtained for specimens of commoner and more easily bred varieties, such as the collie. Of late, however, the prices have rapidly ascended, as is only right, for the bulldog is one of the hardest dogs to breed. A huge sensation was caused when, two years back, Mr. Walter Jefferies sold his bulldog, "Rodney Stone," to Mr. R. Croker (son of "Boss" Croker, of New York) for £1,000, the record price. "Rodney Stone" was bred by Mr. Jefferies, and the first man to recognise his superlative qualities, so far as to give him a championship prize, was the Secretary of the London Bulldog Society. Most fanciers regard "Rodney Stone" as the best bulldog ever seen, and even those who do not quite go so far, place him amongst the three first.

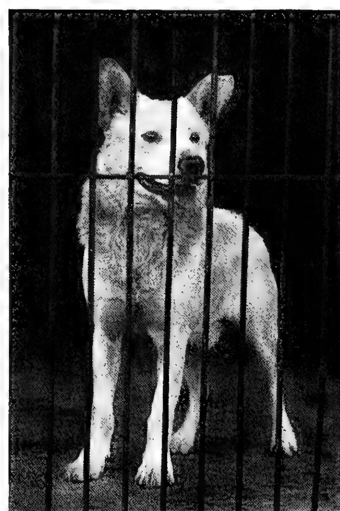
THE ANIMALS' RACE AT THE NEW YEAR'S DAY SPORTS, DEELFONTEIN, 1902.

An Animals' Race.

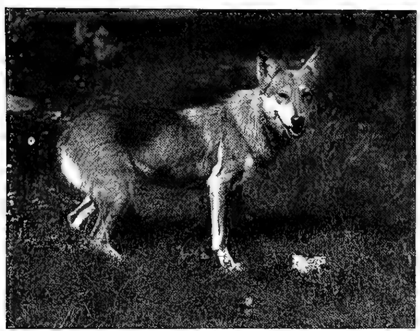
Sport in war-time would seem a paradox, and yet the average Britisher is so devoted to playing at something that, even amid the clash and din of war, he seizes the first available opportunity to get up a match of sorts. The 1st January, 1902, was a day long to be remembered in one of our largest military hospitals in South Africa. Deelfontein is about 30 miles south of De Aar Junction, out on the vast karroo in Cape Colony. Boer and Briton fraternised that day, and the farmers from far and near, many of them allied by ties of kin and sympathy with the enemy, failed not to accept the kindly invitation of Colonel A. T. Sloggett and his staff. Among the "events" of a long and varied programme quite the most interesting was the animals' race. The gentle lamb and the swift ostrich, the dog and the wily jackal (three varieties), not to omit the small meer-kaat of the veldt, pitted their swiftness and endurance against each other for their own amusement and that of the white and black residents and visitors. Roars of laughter greeted the efforts of each owner to urge on his pet. The learned medico with his lamb (which persisted in stopping and gazing plaintively the other way), the brave hunter with his jackal, and the learned "Padrè" driving his meer-kaat contributed fun indeed, with several others. Great was the applause when one of the jackals passed the ribbon, an easy *first.*

Wolves.

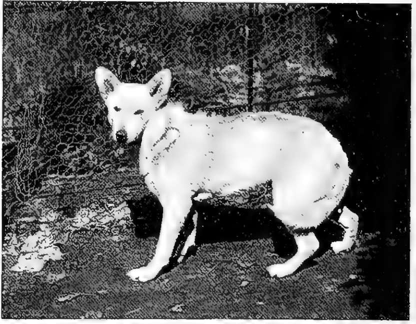
WHITE wolves are rare in this country, and not common in their native country. In some parts, when a white wolf has been seen, the peasantry weave all sorts of superstitious legends about him. The larger of the two specimens reproduced on this page was presented to Mr. H. C. Brooke by the Hon. Walter Rothschild, to whose museum at Tring he will return on his death. The smaller (a female) is their joint property, and is kept at Welling as a house-pet, where we saw her living in perfect amity with a hairless dog, several



MALE WHITE WOLF.



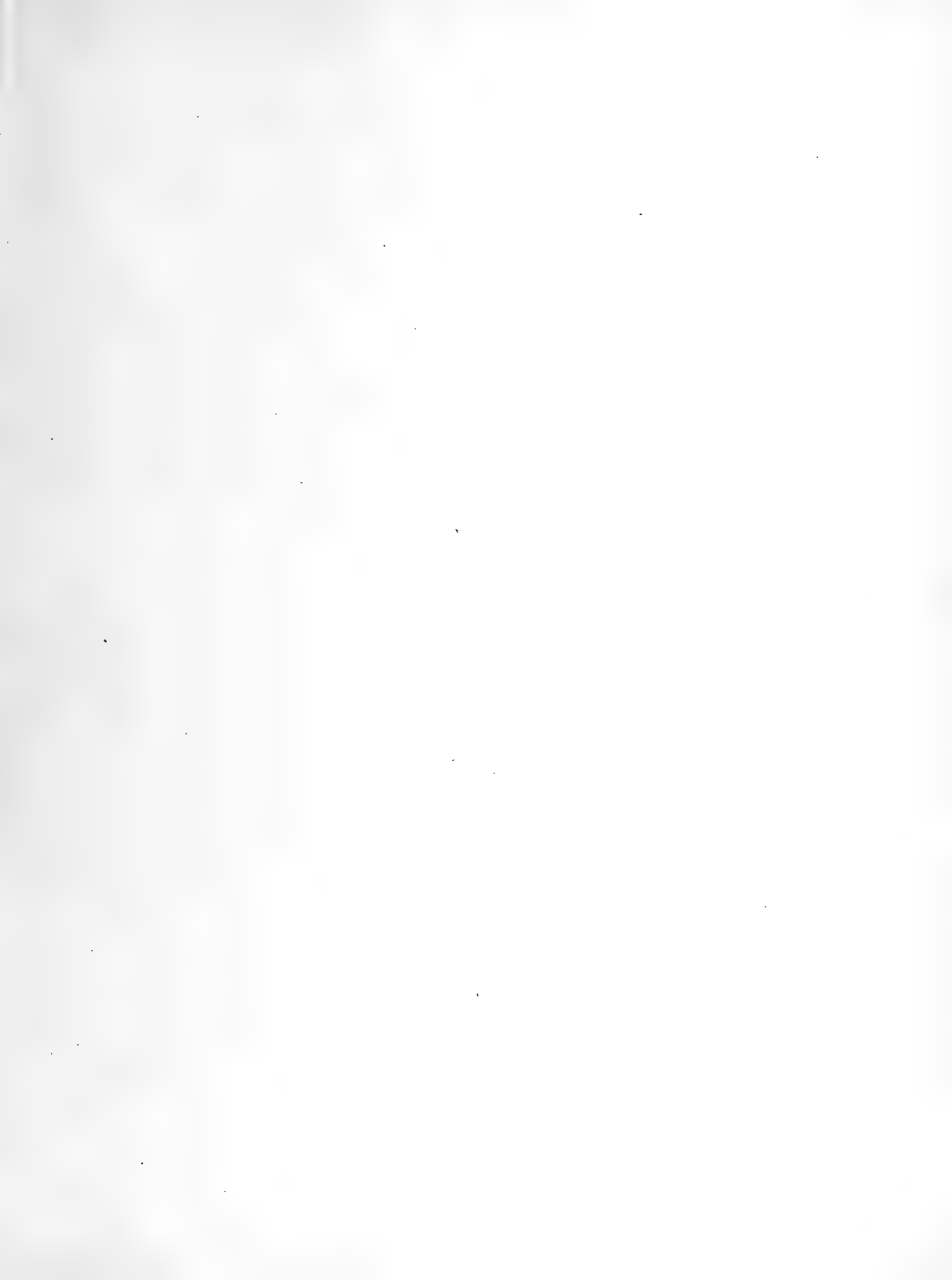
Photographs by Hutchinson & Co.
FEMALE RUSSIAN WOLF.



FEMALE WHITE WOLF.

valuable cats, and some guinea-pigs. She is an excellent guard, and has learnt to bark almost like a dog, but only does so when there is a reason for it. Hopes are entertained that by mating her with the larger specimen, white cubs may be obtained. When female wolves are kept clean and fed on good sound food they are quite free from the strong smell one notices at menageries, where these animals usually get the coarsest scraps; at most, when rainy weather is impending, is a faint wolfish odour perceptible.

To Mr. Brook also belongs the other wolf portrayed on this page. Though by many considered almost untamable, the wolf is really very susceptible to domestication; this one was not brought up as a pet, but she is extremely affectionate, and her master leads her about everywhere. She plays like a puppy, will pull off her master's gloves, unlace his boots, take a handkerchief from his pocket, eat sugar from his mouth, and so on. She is now rather dangerous with strange dogs, having in her youth often been annoyed and frightened by street curs, which now she does not forget; but she will readily play with any dog who exhibits a friendly spirit or with whom she has been out once or twice. She is an excellent mother, and is the dam of the wolf-dingo hybrid owned by the Hon. Walter Rothschild.



THE LONG-EARED OWL.

From a photograph from life by R. B. Lodge, Enfield.

Photograph by Lord Delamere.

AFRICAN ANTELOPES IN THEIR NATIVE HAUNTS

AN AFRICAN GAME HAUNT OF THE PAST.

By F. C. Selous.

IN the year 1891 I visited for the first time the neighbourhood of the lower Pungwe river in South-East Africa. For twenty years previously I had wandered and hunted over vast areas of country, from the Cape Colony to far-away north of the Zambesi, and in that time had seen game of all kinds, from the elephants, rhinoceroses and buffaloes of the forest regions north of the Limpopo river to the wildebeests, blesbucks and springbucks of the southern plains, gradually decrease and dwindle in numbers to such an extent that I thought that nowhere south of the great lakes could there be a corner of Africa left where the wild animals had not been very much thinned out, either as a result of the opening up and settlement of the country by Europeans or owing to the extensive acquisition of firearms by the native tribes. However, I was mistaken, for in the year 1891, when attempting on behalf of the Chartered Company to discover a route free of the tse-tse fly between Mashonaland and the East African coast, I walked into the last great natural game reserve south of the Zambesi, in which up to that time no European sportsman had, I believe, ever hunted, and the fell plague of rinderpest, more potent for mischief than many legions of human game destroyers, had until then been equally unknown. Moreover, the natives living in this low-lying, fever-haunted district were few in number and almost destitute of firearms. Elephants still wandered over this tract of country, often in large herds, as their tracks and pathways leading in all directions plainly showed. But these animals, whose fatal possession of ivory has made them an object of pursuit to man in South-East Africa ever since the days when the ancient Arabian traders carried gold and ivory to King Solomon, appeared to have inherited a timid and restless disposition which, in spite of a present immunity from persecution, kept them always on the move. All other animals were, however, singularly tame and confiding. Great herds of buffaloes feeding in the reed beds along the rivers or lying in the shade of the scattered thorn trees allowed a near approach before taking alarm, and some of the old bulls which were frequently encountered either alone or in little bands of four or five together would scarcely take the trouble to get out of one's way. I remember

Photograph by Norman B. Smith, Esq.

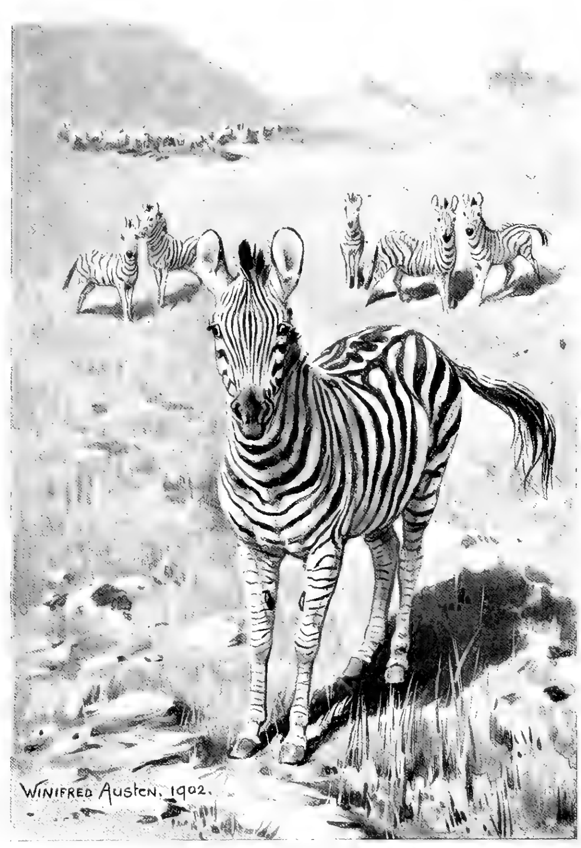
A WATERBUCK REPOSING.

when first descending from the broken country at the head of the Mutachiri river, where there was but little game, into the level coast plains the first buffaloes I encountered were five old bulls. I saw them lying in the shade of some palm scrub on the bank of the river whose course I was following.

As I walked towards them they raised their great armoured heads and looked curiously at the first human being with a hat and shirt on they had probably ever seen. My small retinue of native servants were just then some little distance behind, and not until I was within fifty yards of them did first one and then another of these massive black bulls rise from his bed. But not immediately to run off, for they stood their ground and still for some time stared inquisitively—one might almost have said menacingly—with outstretched noses and horns laid back on their necks. However, in a long experience of African buffaloes, I have not found old bulls of this species either savage or aggressive when not molested and when feeding or resting in ground sufficiently open to allow them to see anything approaching, though a sudden charge by a buffalo lying in long grass or thick jungle, which has either been previously wounded by a hunter or mauled by lions, is a not uncommon incident of African travel.

On the occasion of which I am speaking, when I was not more than thirty yards from the five old bulls one of them actually came trotting towards me. I then took off my hat and waved it, shouting out at the same time. Then the old fellow turned and trotted away and, soon breaking into a heavy lumbering gallop, was quickly followed by his companions. Later on, the same day, another solitary old buffalo bull allowed me and my native followers to walk past within eighty yards of where he lay without even troubling himself to get up. After the buffaloes, the bushbucks were the tamest animals in this great natural game park. These lovely little animals, whose rich dark brown coats are in this part of Africa most beautifully banded and spotted with white, would stand gazing at me, amongst the scrubby bush or open forest they frequent, and often allow a very near approach. The denizens of the open plains—blue wildebeests, tsesébes, Lichtenstein's hartebeests—were wilder and more wary than the buffaloes and bushbucks, but still tame compared with their much-hunted relatives in other parts of South Africa. Waterbucks, reedbucks, oribis, and zebras (Burchell's) were all very tame and confiding, and the latter, if they did not get one's wind, very inquisitive, as I have found them to be in other unfrequented districts. One day I was resting with my native attendants and taking a mid-day meal on one of the large ant-heaps with which many parts of South-East Africa are studded, when a herd of perhaps 100 zebras came up over the open plain to see what was going on. Led by a gallant-looking old stallion, the whole troop advanced slowly to within about a

hundred yards of where I and my boys were sitting. Then they halted, and for a long time all stood quite still with ears pricked and eyes turned towards us. After a time the leader came walking slowly forward and was soon followed by a few other adventurous spirits, the mass of the herd remaining where they were. I was myself so absorbed in watching this novel and interesting sight that I did not observe that one of my Kafirs (who took no interest in anything but dead zebras) had stood up behind me, until I saw the most venturesome of our visitors turn round and trot back to their companions. I then told all my boys to sit down and keep quite quiet, but although the old stallion and a few of the bolder spirits amongst his followers came forward again, they would not approach nearer than about seventy yards from us, the whole troop moving up slowly behind them. I suppose I must have sat watching these beautiful animals for upwards of an hour, and they did not finally trot away until we had got our things packed up and were preparing to move in their direction. I found both the wart hogs and the bush pigs, too, either very tame or very stupid, and several hippopotami which were disporting themselves in small muddy lagoons were at my mercy, had I wished to interfere with them; but on this trip I killed very few animals and never anything larger than a hartebeest, nor did I fire a single shot except when obliged to do so, in order to secure a supply of meat for myself and my native attendants. In a country so well stocked with antelopes, zebras and buffaloes, carnivorous animals, it may well be supposed, were not wanting, and, indeed, in no part of Africa probably were lions, leopards, hyænas, wild dogs and jackals more plentiful than they were some ten or twelve years ago in the neighbourhood of the Lower Pungwe river. But all carnivorous animals are more or less nocturnal in their habits and therefore only occasionally encountered in the daytime; and on the occasion of my first visit to this district I saw neither lions, hyænas nor leopards,



A TROOP OF BONTE QUAGGA.

"Then they halted, and for a long time all stood quite still with ears pricked and eyes turned towards me."

though the two former animals roared and howled nightly round my camp and the grunting cry of the latter was often heard. Nor was I much more fortunate in this respect on my second visit to the same part of the country in 1892, for though I spent six weeks travelling and hunting in the country lying between the Pungwe river and Lake Sungwe during October and November of that year, I only saw three lions, though there was not a single night during the trip on which I did not hear some of these animals roaring, sometimes close to camp, at others in the distance. On several occasions, too, I heard three different troops or families of lions roaring on the same night. On the day when I saw the three lions, I had left camp with a few native followers very early one morning, and was walking across an open plain studded with large ant-heaps, from which the long grass had been for the most part burnt off. On my right was a small river whose banks were fringed with a thick growth of scrubby bush. My course lay parallel to this river but outside the strip of bush. Suddenly I came in sight of two lions at a distance of 400 or 500 yards out on the open plain. They were advancing at a slow walk towards the river and had been previously hidden from our view by some large ant-heaps. These two lions saw us at the same moment that we saw them and at once halted and stood watching us. Telling my native attendants to sit down and remain where they were until my return, I commenced to walk towards the lions, hoping that they would allow me to approach within shot before running off, as I knew that these animals, which in many parts of Africa are very shy and wary, had very little fear of man in the Pungwe river district. However, before I had advanced fifty paces, both lions turned round and commenced to walk slowly towards a small patch of long yellow grass which had escaped the last grass fire. They walked away from me at a very slow and leisurely pace. One seemed a monster, the other either a female or a young male with no mane. I now commenced to run towards them, and had trotted forwards for a short distance, when a third lion that had previously been hidden by a large ant-heap was suddenly revealed to me. He had evidently been walking over the plain about 100 yards to the right of the other two lions, and, not having seen me, did not understand why these latter had first come to a halt and then turned round and walked back again in the direction from which they had just come. When I first saw the third lion he was standing turned away from me and looking at the other two. Quickly swerving to the left but without stopping I almost immediately had a large ant-heap between us, and then ran to it at my utmost speed. This ant-heap was quite 20 feet in diameter at the base and perhaps 15 feet in height. I quickly climbed half-way up it and then looked round the side, and saw that the single lion was still standing watching the other two, which were at that moment just entering the patch of long grass of which I have already spoken. I now edged myself in a sitting position to the side of the ant-heap nearest the lion and prepared for a shot. He was facing half away from me and something more than 200 yards off; but there was not so much as a blade of grass in the shape of cover on the level burnt plain between us, and

Photograph by Norman B. Smith, Esq.
A WATERBUCK.

"When I first saw the third lion he was standing turned away from me and looking at the other two."

had I attempted to get nearer to him he would certainly have seen me at once and then trotted away after his companions. So steadying myself and taking very fine with the 200-yards' sight, I fired. My bullet must have passed close beneath the brute's chest—I think behind his fore legs—as I saw it knock up the dust just beyond him. He at once sprang to the spot where the bullet struck the ground and again stood still, facing now exactly away from me and without apparently having taken any notice of the report of my rifle—a ·450-bore single-barrelled Gibbs-Metford. Extracting the empty cartridge and pushing a fresh one into the breech, as silently and quickly as possible, I fired again, this time taking a fuller sight and aiming for the centre of the lion's somewhat narrow hindquarters. The dull thud which answered the report of the rifle assured me that I had hit him, but I never saw a lion before make so little fuss about a wound. He gave one spring forwards, accompanied by a loud growl, and then stood still again. But only for a moment. Then he came trotting round towards where I sat on the side of the ant-heap, turning first to one side then to the other, and evidently searching for what had hurt him, and I am sure that had he made me out he would have charged instantly. However, I was dressed only in an old felt hat, a cotton shirt, and a pair of shoes, and my scanty garments and bare sunburnt limbs were all so weather-stained and harmonised so well with the neutral tints of my immediate surroundings that he never saw me. I had thrown the empty cartridge out of my rifle before the lion turned, but had no time to reload before he commenced to trot towards me, for knowing that the slightest movement on my part would attract his attention, I sat perfectly still, feeling sure that in case of a charge I should have ample time to slip the cartridge, which I held ready in my hand, into the breech before he got to me. However, he never discovered me, though he approached to within 100 yards of the ant-heap on the side of which I was sitting. He then stopped, and after first looking towards me, turned round and once more stood facing exactly away from me. This was my chance, so hastily loading and putting down the 200-yards' leaf sight, I again fired at him and again heard my bullet strike. With a loud growl he sprang forwards and then went off at a gallop. He turned almost immediately and, running almost broadside to me, made for a large ant-heap with some bushes growing on the top of it. Before he reached it I fired again and knocked him down, but after having lain still for a few moments he got up and half ran, half dragged himself to the ant-heap and disappeared behind the bush on its summit. I now walked round and reconnoitred the ant-heap behind which the lion had disappeared, and found that just beyond it there was a small patch of unburnt grass quite six feet high, in which no doubt he

Photograph by Norman G. Smith, Esq.
FRONT VIEW OF WATERBUCK LYING DOWN.

was hiding. To have approached this patch of long grass across the open plain would, I felt sure, have meant facing a fierce charge at close quarters, for the wounded lion had shown every sign of being a savage and determined animal. About 200 yards to the left of the place where the lion was lying was another ant-heap at the foot of which grew two good-sized trees, and as I thought I might be able to see something from the top of one of them, I went back to where I had left my Kafirs, and taking one of them with me made a circuit and came up behind the trees. My native attendant quickly climbed to the top of one of them, but declared he could see nothing of the lion, although he said that the patch of grass in which it was lying was very small. He then began to come down the tree again, talking all the time. He had got about half-way when two wart hogs that had been lying asleep somewhere near us, disturbed by his voice, got up and went trotting straight towards the spot where the lion was lying. They did not enter the grass, but passed close to it, and the lion must have heard them coming and

Photograph by Lord Delamere.

A TROOP OF BLUE WILDEBEEST.

made ready at once to repel another attack, for the Kafir suddenly saw him standing just within the edge of the grass. "Sir, sir, I can see the lion," he called to me in his own language. "I can see nothing," I answered. "Come up the tree a little way," he said, "and you will be able to see him." I told him to come down low enough to reach the rifle I handed to him, and then climbed into the lower branches of the tree. When about ten feet above the ground I could see the lion's head and the outline of his back indistinctly through the grass. First aroused by the near approach of the wart hogs, he was no doubt now listening to us talking. I got a little higher up the tree, but although from this position I commanded a somewhat clearer view, I could not steady myself to fire, so I came lower down and fired a shot with the 200-yards' sight. This shot missed the lion altogether, but it had an excellent effect, as he at once charged out of the grass and came straight towards where he had heard the talking. At first he showed signs of partial paralysis of the hindquarters, but gathering strength with every stride he was soon

"I let him come on to within about fifty yards of the tree in which I was perched."

coming along at a great pace, growling savagely and evidently prepared to make things warm for the first human being he met. I let him come on to within about fifty yards of the tree in which I was perched and then shot him right in the chest with an expanding bullet, which tore open his heart and killed him almost immediately. This is the last of the thirty-one lions I have shot, and the first and only one of these animals that I have shot from a tree. He was a fine full-grown animal, just in his prime, with a good mane for a coast lion, very thick set and heavy in build, and enormously fat. My first two bullets had struck him close together just below the tail, and either would probably have killed him had it been a solid projectile, but being expanding bullets they had probably not penetrated beyond the stomach. We found subsequently, on examining the place where he had been lying in the grass at the foot of the ant-hill, that he had vomited great lumps of the meat and skin of a wildebeest on which he had been feasting the preceding night. My third bullet had struck him too far back, behind the kidneys, and passing just below the backbone had momentarily paralysed his hind-quarters, causing him to fall when hit and subsequently to show weakness in the hind legs.

LONG-EARED OWL.

Our coloured plate this month is from a photograph, by Mr. R. B. Lodge, of the Long-eared Owl (*Asio otus*). Although, like the poor, always with us, its numbers are considerably increased during the Autumn by migrations from the Continent. It is a handsome bird with somewhat cat-like colouring, and large round, fiery, yellow eyes which give it a rather uncanny appearance. It lays its eggs very early (sometimes while the snow is still on the ground) in an old squirrel's drey or in the deserted nest of a crow, rook, heron, magpie, etc. Its food consists chiefly of mice, rats, and insects.

HOME LIFE IN BIRD-LAND.

By Oliver G. Pike.

[The following extracts from "Hillside, Rock and Dale: Bird-Life Pictured with Pen and Camera*" are more eloquent tributes to the value and interest of the book than anything that we could say in its favour. For this reason we give them, by permission of the author and the publishers, with no other comment than a hearty recommendation to every reader to lose no time in getting the volume.—Ed.]

The Troubles of a Bird Photographer.

THE patience of a Nature photographer is sorely tried at times. Without the aid of electricity it would be almost impossible to photograph many kinds of birds. Before I obtained my pictures of the little grebe, I tried to take them with a pneumatic attachment to the shutter; but the birds were so rapid in their actions that I found them not to show on the plates when I developed them—they had dived out of sight while the air wave was travelling along the length of tubing. The pictures obtained show the success of the electric shutter, which was exposed the instant that I wished, although I was many yards away. I had great difficulty in photographing the lapwing; three days were occupied in securing a series of eight pictures. My camera was well concealed underneath a heap of rubbish, which was previously placed near the nest. I was in hiding behind a hedge over a hundred yards away, and watched the bird with my field-glasses. The wire connection being not quite long enough, I had a length of string attached, with which to connect the wires. If it had not been for this, I should have progressed well; but somehow some cattle which were grazing near insisted upon entangling their feet in this, and thus exposing the plate. Bird photographers get used to little trivialities like this. Many plates were wasted, and a climax was reached on the third day. First a calf came along and got its feet caught in the string, and so exposed the plate. After another hour or so several cows walked towards the camera and looked well at it; then one, seemingly more inquisitive, looked into the hole which was left for the lens to point through, put her tongue into this and licked the glass. When these were driven away a horse became entangled in the string and spoilt another plate. About noon six horses trotted gaily up to the camera and seemed to hold a short consultation, and then commenced business. One began eating the electrical apparatus, others chewed the covering of the camera, and one, which I had not noticed, swallowed a length of string, and then, finding some discomfort, bolted, pulling everything over into confusion. I thus had a rather serious affair at one end of my connection, and what might be likened to a very large fish at the other. Bird photographers after all are only human, and I could not endure all this, so I packed up and left the horses and birds to themselves.

DABCHICK SWIMMING WITH BODY SUBMERGED.

LITTLE GREBE.

* Illustrated with 110 photographs taken direct from nature by the Author. London: Hutchinson & Co. 1 Vol., 6s.

DABCHICK ENTERING NEST.

DABCHICK SITTING ON NEST.

To see the little grebe at home we must go to one of the higher lakes. Swallows are gliding over the surface, the snap of their beaks as they take in a fly being distinctly heard. Martins with their white rumps follow the swallows, and "dip" every now and then to take an insect from the water. On one side of the small lake is a rookery. Young rooks are calling and clamouring for food, and as the old birds approach with supplies of delicacies, the youngsters are in danger of toppling out of their homes in their eagerness to get the first bite. A blackcap gives out his loud, mellow notes from near his nest; and a chorus of other bird music greets our ears as we wander round this picturesque stretch of water. Each tree has its music: thrushes sing from the elms; the *coo-coo* of ring-doves comes from the cedars. The bushes are made charming with the notes of warblers—blackcaps, whitethroats, and willow-wrens. A chiff-chaff calls merrily from an ash; and near are a pair of goldcrests. This lake, with the spring sunbeams playing on its surface and the music all round about, is the home of the little grebe or dabchick. These birds love quietness; here is solitude as well as perfect harmony. We now know something about the bird's haunt; we will therefore watch the dabchick at home.

The Haunt of the Little Grebe.

There is a ripple on the water, only a slight disturbance; the widening rings expand and the pond is soon still again. But watch the surface once more; the water is disturbed, and we see just the head and neck of a bird. The grebe quickly glances round, then dives, and a few seconds later is up again to swim towards the water-ranunculus, then, diving, we lose sight of him. This is the male; his mate is sitting on her five eggs by the water's edge, and if we watch the small bush under which she is sitting, we shall see the male rise there or near the spot. He comes up a few feet to the right, swims under a clump of rushes, and takes another look round. Seeing that there is no danger, he swims towards the

DABCHICK'S NEST COVERED.

DABCHICK'S NEST UNCOVERED.

nest and offers his mate some food. The hen takes this love-gift and then immediately dives.

The Dabchick at Home.

The bird now glances in the direction of his thankless mate, then climbs on to the nest and takes his turn at sitting. In half-an-hour the hen returns. I watched these birds for nearly three days, and seldom saw one sit for more than half-an hour at a time. Sometimes they changed after five minutes' sitting. It was a pretty exercise to see them change. The bird about to relieve the other came up at the back of the nest, then the sitting bird dived almost before the other's head showed above water. When a dabchick leaves the nest it is the usual custom to cover the eggs. The nest is often built on the surface of the water, and when the eggs are covered it looks exactly like a clump of floating weed. It is exceedingly interesting to note how quickly the sitting bird covers her eggs if any intruder approaches. The instant footsteps are heard she stands in her nest, and, with her two feet, scrapes and pushes water-weeds over her eggs. She also uses her beak to lift the larger pieces. Once, when a little dog came along the path, the grebe covered her eggs and dived out of sight in the space of ten seconds. Each time she commenced sitting the first thing was to uncover the eggs, and then the water-weeds were arranged round her in such positions as to be most convenient for recovering the eggs if further danger was threatened. These birds sat on their eggs for three weeks, and then five tiny, fluffy balls of feathers—the young grebes—appeared. These little creatures, not much bigger than large walnuts, are remarkably clever swimmers and divers, and are so as soon as they leave the shells. I was able to get near them one day, as they were all swimming about near their nest. The parents were there also, and seemed to be in a great state of excitement. Instead of diving, the young all scuttled towards their mother, and a very pretty thing happened. She slightly raised her wings, and the youngsters—five in all—crowded underneath. When all were out of sight she dived, with her family under her wings, and came up some considerable distance away. This alone shows what perfect swimmers and divers these extremely interesting birds are. When the young were about four weeks old the parents constructed another nest, but this was blown from its moorings during a violent storm. However, a third nest was made in a more secure place, and the eggs were duly hatched. A share in looking after the second brood falls to the lot of the young of the first family; and when all these are full grown they make their way to other ponds, and are sometimes even driven by their

LAPWING.

RAVEN'S NEST.

parents, thus leaving the latter in sole possession of a haunt where there is not sufficient accommodation. "One-room life" or overcrowding is far from being in accordance with the views of the knowing old birds of the little grebe species.

The Raven's Little Ruse.

Not a great many years ago ravens used to breed in our inland counties. The tree still stands in which the last pair bred in Middlesex. Still, these birds are not altogether confined to the wildest parts of our coasts, for in one or two well-protected inland spots they still build and lay. It was in one of these inland breeding haunts that I saw and studied the habits of these outlaws of the air. I call them outlaws because they have been driven from most of our English counties by powder and shot, through an erroneous idea that our raven kills and takes lambs and other small animals. In this respect, however, the raven is not such a confirmed robber as the carrion crow. In counties in which I found the former breeding, there were extensive sheep farms. I have it on the authority of shepherds and keepers that the raven seldom, if ever, touched the live lambs, while the carrion crow was a much worse offender, for he was often seen threatening or attacking them. Civilisation has also had much to do with driving the raven from England. . . . We saw a pair of ravens circling over their haunt, and a nest was found apparently not yet ready for eggs. This we afterwards discovered was a dummy, and never meant to contain eggs. The raven, I believe, always makes two nests, and if any intruder approaches, the birds are often seen settling near or flying over the unused one. Time after time we saw a raven sitting on a rock immediately over a dummy nest, his black form outlined in sharp profile against the sky. At last we discovered his little ruse, and found that all the time the hen was sitting on one egg in a genuine nest near by. This was well concealed, and there was every probability of the one egg being hatched.

COAL TIT.

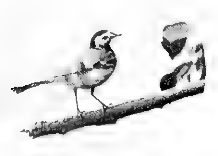
CHAFFINCH.

STARLING.

BLUE TIT.

A Duel in Mid-Air.

When ravens have young the male will almost attack any intruder who goes too near the nest, whether it be man or bird. A keeper I know, who lives near the ravens' haunt, was once sitting near to a nest containing a brood. One of the old birds was flying about the steep dingle or gorge on the hillside, "barking" defiance, and trying to guard his young. A too venturesome kestrel, which, I believe, had a nest in the same dingle, began flying round the larger bird. This so angered the raven that he attacked the kestrel without more ado. The latter, with much better powers of flight, simply toyed with his adversary, and for a long time the two soared round and about, the kestrel seeming to enjoy the fun, while the raven, to judge by his angry "barks," was becoming more and more enraged. At last he became more determined, and with one desperate rush caught up to the little brown hawk, and with a deadly



PIED WAGTAIL.

blow struck him down. For the last time the kestrel dropped with closed wings, as he had done many a time before when catching his prey, but this time he fell to the banks of the picturesque waterfall at the bottom of the dingle, and when the keeper went down he found that the bird's head was nearly severed from its body. The raven had probably struck his foe with one of his great wings, and to judge by his contented calls as he returned to the nest, this outlaw of the air felt well satisfied with his victory.

Cormorants.

There are two colonies of Cormorants on the Farne Islands, the best known being that on the Harcars; the other is on the most distant of the islands—the Megstone Rock. We visited both, but the birds were not in their most amiable mood, and would not let us go too close. However, by gradually working closer and exposing plates at each stopping stage, we were able to secure some satisfactory pictures. When all the birds had left, we went among the nests and photographed these, some being nearly a yard high, and might be called pinnacles of seaweed; others are only about six inches high. A few of the nests contained young birds, and ugly, black-skinned creatures they are, and during the first fortnight of their existence they remain blind. They were in this stage when we saw them. As we walked among them they tried to stand up in the nests, craned their necks up, opened their beaks, and swayed from side to side.

CORMORANTS.

UNCOMMON PETS.

A series of articles on the Care and Keep of Animals in Captivity.

By P. Wellington Farmborough, F.Z.S., F.E.S., etc.

II. THE RACCOON.

As a pet this animal has many admirers, and justly so, for after it has become well accustomed to its owner it dispenses with those spiteful ways which characterize the newly-purchased individual. Its peculiar habits, too, make it extremely interesting, as, for example, that of wetting and washing its food before meals in any water which may be conveniently near. There are two species of 'coons, one being the common raccoon (*Procyon lotor*) and the other the crab-eating raccoon (*Procyon cancrivorous*). Of these two species, however, the first-named is by far the commoner and is more widely distributed, ranging from Canada almost as far south as the Argentine Republic. The crab-eating raccoon is practically confined to the tropical Americas—say from central America to no farther south than the northern limits of Brazil. Both species are much persecuted for their beautiful fur, which is no doubt familiar to my readers as the fur which is chiefly used for the small carriage-rug for the feet as a whole skin; but it is also used for a host of other purposes.

A PET RACCOON.

Raccoons are not by any means expensive to purchase, thirty shillings being a fair medium price for one of these animals; the crab-eating species is, if anything, the dearer of the two kinds, but not by more than five shillings. There are usually plenty in the various dealers' hands, such as Cross, of Liverpool, Jamrach's, of London, or Karl Hagenbeck, of Hamburg, and an enquiry from a would-be purchaser of any of these would result in a satisfactory response, or a short advertisement in the columns of this paper probably lead to an *embarras de richesse*. Before, however, purchasing the animal it is always advisable to have its cage or other permanent habitation quite ready for its reception on arrival, as nothing is more harmful than keeping any animal in a small travelling cage in which it has, no doubt, been cramped up into a small compass during a journey of possibly a couple of hundred miles, or even more. The cage ought to be of fair size, not less than four feet long, and proportionately high and broad, with a strong wire front, and doors sufficiently large to enable the interior to be easily and quickly got at for cleaning purposes. In consequence of the great splashing of water caused by the peculiar washing habits of the animal, it is necessary that the floor of the cage be protected by a covering of thin zinc; this is a small job that any tin-smith will do for a half-crown or so. The water vessel should be large and as heavy as possible, so that the 'coon cannot overturn it, a trick which certain individuals of this species are much given to, and one, too, that affords the perpetrator the most lively satisfaction.

Raccoons are almost omnivorous, with perhaps a partiality for a vegetarian diet; but as variety in diet is beneficial to these as well as to all other kinds of animals,

changes may be rung on meat of almost any kind, raw eggs, bread and milk, cooked rice, anything sweet, vegetables, fruit, roots, insects, mice, young birds, frogs, fish, etc. Being nocturnal animals they feed at night, or in captivity during the early evening, towards which time they get very lively and restless. When there are no other domestic pets kept, as, for instance, cats, dogs or cage-birds, the raccoon may be allowed partial liberty; but if there are any birds about master 'coon is pretty sure to have them sooner or later. The raccoon is not quite so bad in this respect as a Coati, for the 'coon can be taught not to interfere with other pets, but the coati can never—at least, that is the writer's experience. As pets, raccoons are remarkably hardy creatures, in spite of one or two people stating they found them delicate, and seven years is not an unusual period of life in captivity; there must, however, be no pampering, as this in itself is prejudicial to the life of nearly all animals. Scientifically the raccoons form a connecting link between the bears and the weasles, being more closely allied to the former of the two families. In common with the bears and weasels, raccoons when tamed are remarkably playful animals, and when in the humour for a game they throw off all their reserve and will play by the hour together with their owner or anyone with whom they are familiar; but at the advent of any person with whom they are unacquainted, the natural reserve re-asserts itself, and they at once resume their normal aspect of semi-quietude. Cleanliness is an imperative factor in the management of these animals. The cage should have the floor covered with sawdust to the depth of half-an-inch, and a large ball of hay or straw be placed in one corner to retire into whenever necessary. The bedding and sawdust require to be changed every day, and the zinc floor scrubbed over with hot water and carbolic soap at least once a week. If it can conveniently be arranged, a part of a large branch of a tree may be placed diagonally across the cage from the front bottom corner to the top back one for the use of the 'coon, but it is not absolutely necessary, and may be dispensed with if it cannot easily be procured. Raccoons are sociable animals, and when in a state of nature are generally found in small bands, so that it is an advantage to keep a pair. The writer once succeeded in breeding these animals some seven or eight years ago. There were five young ones, and all were successfully reared. The dam showed herself to be very jealous, and would scarcely permit myself, even, to touch them, and exemplified her specific name of *lotor*—which, by the way, signifies "washer"—by continually washing them, until at times they seemed quite exhausted. Teasing, either by the owner or by visitors, must be carefully guarded against, as nothing is more certain to sour the temper of this or any other animal. A frequently teased raccoon in a very short time gets most uncertain in temper, and would fly at any person at very slight provocation—a most undesirable habit in any kind of pet.

A PET RACCOON.

ZOO NOTES.

Described and illustrated with Photographs by W. P. Dando, F.Z.S.

The Common and Darwin Rhea.

The Rhea, or, as it is sometimes called, the American Ostrich, is smaller than the true ostrich, and the whole plumage is much more sombre, but the feathers, as in the ostrich and apteryx, have no after shaft. There are two well-established species—*Rhea americana* (the common) and *Rhea darwin* (Darwin's rhea), the former ranging from Bolivia and the south of Brazil, the latter eastern Patagonia. These birds exhibit very similar habits to the ostrich, and, although they are incapable of flight, the wings are better developed than in any other of the so-called "struthrous" birds. To make up for their incapacity of flight, they can run with very great rapidity, and both sexes have the curious habit of forming a kind of sail with one of their wings by raising it above their back when running from their pursuers. The colour of their eggs is white, and it is the male bird which incubates; during this period he is very ferocious and even dangerous, having been known to attack a man on horseback; being possessed of a claw on each of his three digits, he can inflict some very nasty wounds.

COMMON RHEA.

Fringed Gecko.

Mr. Walter Rothschild has again furnished a unique addition to the reptile house at the Zoo, and anyone who has not carefully observed the Fringed Gecko should lose no time in seeing this curious reptile. There is something very weird and uncanny in the appearance of this strange-looking animal, which is the sole member of a genus characterised by the presence of an expansion of skin running down the sides of its body and legs, the neutral colour of which has dabs or patches of greyish-white markings which are no doubt protective, as is proven by the fact that since the reptile has been at the Zoo its general colour and that of the patchy markings have changed perceptibly, and has now assumed an appearance nearer in colour to its surroundings. Although the gecko is between seven and eight inches long, many visitors have been observed to pass the vivarium when the animal has been prominently spread out on a small tree branch without noticing it. A native of Madagascar, the fringed gecko which, Flancourt (*Histoire de l'Ile Madagascar*) says, lives on flies and small insects, has the ability of attaching itself to trees by means of minute sharp claws at the tips of its limbs, chin, and tail, which, although invisible, give the animal the power of attaching itself so strongly that it has the appearance of being glued on to the branch. The tail,

DARWIN'S RHEA.

FRINGED GECKO. Upper and under sides.

no doubt, has some power of attachment, and when specimens are examined this matter will probably be cleared up. The natives call the animal *famocantrata* (the beast that springs on the chest), and assert that on anyone approaching a tree where one of these geckos is resting, it would leap at his chest, and instantly attach itself so firmly that it could not be detached without removing the skin with a razor. Now, having observed the specimen at the Zoo adhering to the plate glass of the vivarium, I was anxious to obtain a photograph in this position, as it is patent that the animal did not depend on spider-like claws for its power of adhesion to glass in the vertical position, which the reverse photograph illustrates, and proves that the animal has some power of adhesion at the ends of its digits (at least) which enables it, like the house-fly, to attach itself to any object, even polished plate-glass. No doubt the matter will be thoroughly dealt with in the Zoological Society's publications.

Iguanas from the Galapagos Archipelago.

ANOTHER of Mr. Rothschild's deposits at the Zoo, which has excited considerable interest among naturalists, is the group of Galapagos Iguanas, originally seven in number, but now, unfortunately, reduced to one specimen. This sole survivor shows very little animation, remaining on the shingle with closed eyes, and only takes food when forced into its mouth.

Darwin ("A Naturalist's Voyage," Chapter xvii.), in his account of the Galapagos Archipelago, gives a full description of these iguanas living in multitudes ("we could not for some time find a spot free from their burrows on which to pitch our single tent") on Indefatigable Island, which is the more remarkable considering that the entire "archi-

GALAPAGON LAND IGUANA.

pelago is entirely formed of volcanic rocks; a few fragments of granite curiously glazed and altered by the heat, can hardly be considered as an exception." Mr. Walter Rothschild gave me special facilities for getting photographs of these extraordinary lizards, and I am sure he will excuse my quoting a portion of one of his letters to me on the subject of these reptiles, his great authority being universally acknowledged: "The Iguanas are *Conolophus subcristatus*, sub-species *pictus*, described by myself in a footnote in my article on the Galapagos in Vol. 6 of the 'Novitates Zoologicae,' and subsequent volumes. They are entirely terrestrial as opposed to the famous Marine iguanas (*Amblyrhynchus cristatus*) of the Galapagos, and live in subterranean burrows. Their food consists of cactus shoots and fruit entirely, and they were brought by Mr. R. H. Beck, on his last voyage, having had them on board the vessel for nine months before reaching San Francisco."

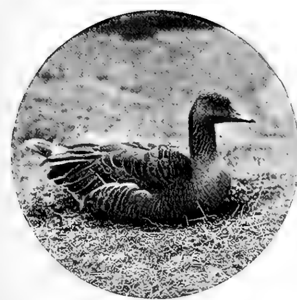
BENNETT'S TREE KANGAROO.

A VERY healthy male specimen of Bennett's Tree Kangaroo has lately been added to the menagerie at the Zoo. During the repairs to "Mickie's" old quarters (the sloths' house) this animal was caged in the gallery above, and, as it is a very sprightly creature and the borrowed autumn light in the gallery is very weak, a good photograph was impossible, the animal being never still for a second. The lower photograph was taken to show the tail, which, it will be observed, differs from that of the ordinary kangaroo or wallaby; the fore-limbs also are longer, enabling the animal to climb, and in the true arboreal species the original form of the foot persists. Huxley believed that the kangaroos and wallabys were of arboreal origin, and that the foot as well as the hand was originally of a prehensile type. The kangaroo foot, as we now know it, consists practically of a single digit, the fourth (with which it can inflict very severe injuries), the other digits being remnants of former toes. On the hand of the fore-feet, however, the five toes still remain. Bennett's tree kangaroo is a striking instance of adaptation in the one case to tree life, and the ordinary kangaroo or wallaby in the other to existence on the ground.

Bennett's Tree Kangaroo.

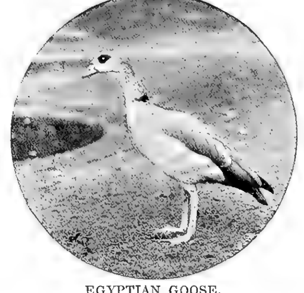
FIVE different varieties of wild geese are given as illustrations of the difference in the markings of these birds; and when it is considered that there are 33 varieties at the Zoo, the number shown will only convey a broad idea of their beauty—one can hardly say grace. The wild goose is supposed to breed in the northern parts of Europe, and in the beginning of winter to descend into more temperate regions. They are often seen flying at very great heights in flocks of from fifty to a hundred, and seldom resting by day. The Bean goose, or, as it is frequently called, *wild* goose, is common in many parts of the country from autumn until late in spring, and is said to exhibit

A variety of Geese



BEAN GOOSE.

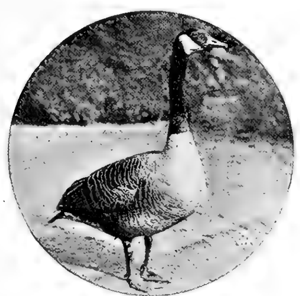
a fondness for newly-sown beans, amongst which it creates considerable havoc. The various flocks, during their residence in this country, have each their particular haunts or feeding districts, to which they invariably return. The Egyptian or Nile goose, which is often seen figured on Egyptian monuments, was the "fox-goose" or "chinalopex" of the Greeks, so called perhaps on account of the burrows in which it breeds, or the fox-like colour of parts of its plumage. The other varieties shown agree in one common character of feeding upon vegetables and being remarkable for their fecundity. The French *pâté-de-foie-gras*, for which Strasbourg is so noted, is not a French invention, but a mere imitation of a well-known dish of classic times, made from the livers of the geese of Ferrara, so much celebrated among the ancients for the magnitude of their livers, one of which is said to have weighed upwards of two pounds. Geese have a reputation for stupidity which they (at all events wild ones) do not deserve, as many a sportsman who has tried stalking them will testify; or if this is not sufficient evidence you have only to listen to the tales of woe which the California farmers tell of their provoking vigilance and cleverness.



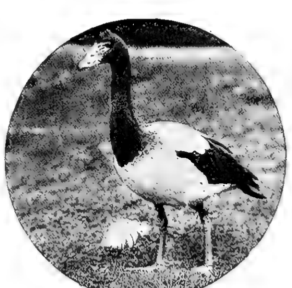
EGYPTIAN GOOSE.

UPLAND GOOSE.

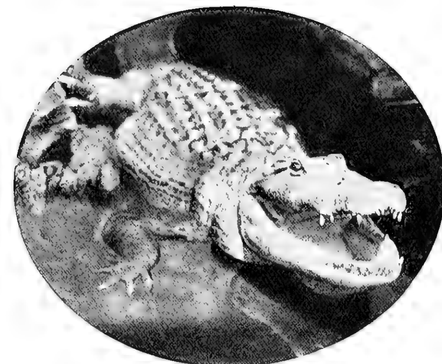
The Turkey. At this time of the year many of us assist at the obsequies of the turkey, and the following description of that bird's nuptials may therefore possibly be of interest. The authority quoted is Neltje Blanchan, and the particular species *Meleagris gallapavo*, from whom our common or farmyard turkey is descended. "Beginning at early dawn in spring," she writes, "and before leaving his perch, the male turkey gobbles a shrill, clear love song. . . Sailing to the ground, the cock at the sight of a hen displays every charm he possesses: his widely-spread tail, his dewlap and warty neck charged with bright red blood; and drooping his wings as he struts before her, he sucks air into his wind-bag, only to discharge it with a pulmonic puff, that he evidently considers irresistibly fascinating." The sequel is not so romantic, as the inattention of the turkey to his mate and young is proverbial.



AUTCHIN'S GOOSE.

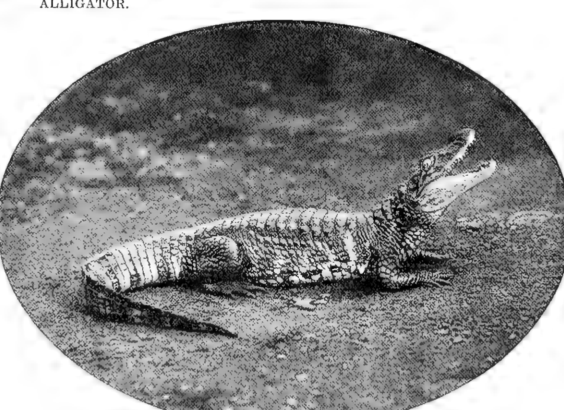


BLACK AND WHITE GOOSE.



ALLIGATOR.

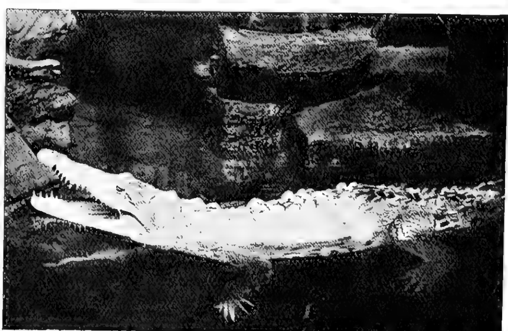
and the "fool." There is a small crocodile at the Zoo called "D'Oyly Carte," after the late Mr. Carte, who kept it at Weybridge for some time, when it escaped into the Thames, causing no little consternation in the neighbourhood. A reward was offered, and after some time it was captured, but, showing a very fierce disposition, was deposited in the Zoo. Although only about a yard long, and young, I do not think anyone would dare handle it. It snaps at anything, and very often jumps up and snaps at visitors who stupidly put their umbrellas and sticks into the pond. In "The Uganda Protectorate" Sir Harry Johnston gives more than one interesting description of African Crocodiles, who appear, he says, to exercise a certain fascination over water-birds.



CAIMAN.

Crocodiles, Alligators, and Caiman.

On this page are given portraits of a crocodile, an alligator, and a caiman, three reptiles all very similar in appearance to the uninitiated, but with differences in their characters which should be carefully studied by the amateur before he decides to keep any of them as pets. For instance, it might be more exciting, but less advisable, to show intimate hospitality to a fourteen-feet long four-hundred-year-old Nilotic crocodile than to allow your guests to admire at a distance the (in comparison) harmless alligator. I should be very sorry to be the messmate of forty full-grown "crocodiles." "I would rather face a ladies' school," notwithstanding the well-known couplet about these two



CROCODILE.

WHITE SCOTTISH TERRIERS

A TRIO OF WHITE SCOTTISH TERRIERS
"Miss Tich," "Nipper," and "Bessie."

By C. H. LANE, F.Z.S., Author of "Dog Shows and Doggie People," etc.

"NEIGHAN."

AMONGST many old sayings we have almost come to regard as proverbs is "Poets are born, not made."

I think the same is very frequently true of fanciers also. I cannot remember the time when I was not a lover of all kinds of living animals; some of them I began to keep as pets before I was old enough to go to school; since then I have never been without a pet animal of some kind or other.

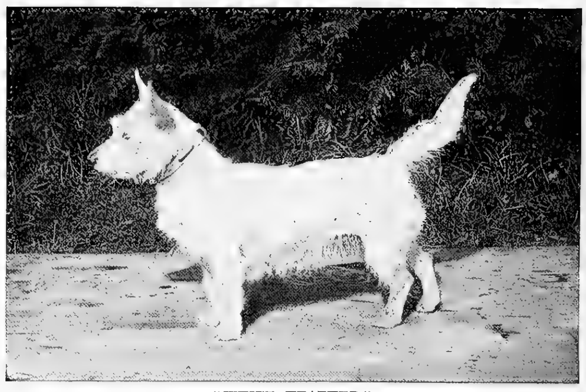
Naturally, with this sort of taste, nearly everything in the ordinary way kept as pets has passed through my hands as owner, and during the last twenty years and upwards has come before me to judge at one place or the other.

Always keenly interested in dogs, even when they held a very inferior position in the world to their standing at the present time, I can well remember the pride I felt when I had one of my very own, an Irish Setter called "Rover," who was my devoted companion as a child and who got me into many scrapes by a bad habit he acquired of chasing sheep, which failing of his eventually led to our parting company. In the course of my walks abroad, and in particular when at some of the large dog shows now held so extensively throughout the Kingdom, I have often been struck with the superficial knowledge possessed by the non-doggy part of the public about the many varieties of dogs seen at the shows. Within the last two years I have come across persons staring in amazement at such well-known breeds as Mastiffs, Bulldogs, Deerhounds, &c., and quite unable to decide what manner of animals they were or for what purposes they were used.

In no previous period of the world's history were dogs so much thought of and cared for as at the present time, and the value of high-class specimens is constantly increasing.

Some of my readers may possibly regard White Scottish Terriers as novelties and productions of modern times, but this is not the idea held by those who know most about them. They have also been regarded as sports, or albinos, but it has been proved they will breed true to colour and type, and although not seen in anything

like the numbers of their darker-coloured brethren at the present time, I have been told that white, or nearly white, puppies have been by no means uncommon; and there are several keen fanciers at work doing their best to revive what they claim as one of the original colours of the variety. From the specimens which have come before me to judge from time to time and the photographs of others I have seen, some of which are reproduced in these pages, I am bound to say these efforts have met with considerable success. Probably it will be known to at least some of my readers that one of the most enthusiastic supporters of the variety has been Dr. A. E. Flaxman, of Pittenween, N.B., who has spent much time, trouble, and money over it, and produced many of the best white Scots seen in the present generation. Other fanciers of the variety have been Lady Angela Forbes, Lady Alwyne Compton, Mr. R. B. Mayor, Miss M. Berens, Messrs. Errington Ross, Geoffrey Head, and Mrs. Firman, all of whom have shown more or less typical specimens.



"WHITE HEATHER."

I may say that the contrast between the pure white coats, dark eyes, and black noses gives a very smart, pleasing expression, and I think we are likely to see more of these little fellows making their appearance at our shows than of late years, as they have all the characteristics of their darker brethren, who have become so popular on both sides of the border.

I have been favoured by Dr. Flaxman (whom I consider far and away the highest authority on this variety) with some interesting notes, from his extensive experience as a breeder, which I propose to quote in his own words; and he has also very kindly placed at my disposal some capital photographs of typical specimens, taken from life, which I feel sure will throw considerable light on the subject:

"JIM."

"It is only reasonable to suppose that the terriers which have been found in Scotland are composed of different types of dogs. A laird who may have inhabited a little island or isolated locality would have bred his dogs to his ideas of what their shape should be, in order that they might be able to hunt amongst the cairns more easily, and another would have bred his dogs to some other type.

"It appears, however, judging by the pictures of Scottish terriers painted by Sir Edwin Landseer more than sixty years ago, the prevailing colour was white or a sort of oatmeal colour. He selected his models doubtless because they were beautiful. In breeding white from dark Scottish terriers of the modern type I have found that their progeny have reverted back, not only in colour but also in type, and you might almost suppose, in looking at these little white dogs, that Sir Edwin Landseer's models had been reproduced; 'Miss Tich,' 'Nipper,' and 'Bessie' are three of these reversions, representing in type some of his models taken from dogs of my own.

"Ten years ago the white Scottish terrier was almost an unknown animal to breeders of dark Scottish terriers. Not that it did not exist, but fashion had so changed that they imagined all Scottish terriers should be dark or coloured other than white.

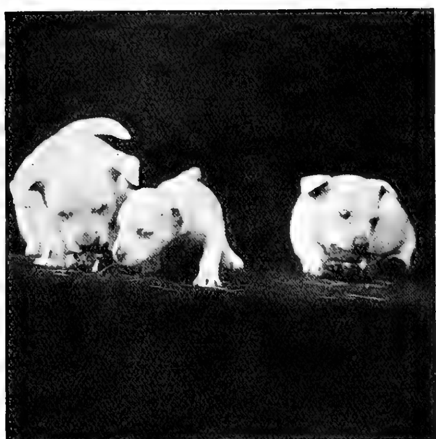
"In breeding all varieties of animals—horses, dogs, cats, rabbits, mice, rats, etc.—variations in colour sometimes crop up. A breeder of animals must never be surprised at the colour, shape or characteristic of the offspring of the animal he is trying to bring to a fixed type.

"DIGNITY AND IMPUDENCE."

"The late Captain Keene bought a white Scottish terrier which was bred from a prize-winning strain of the dark variety. He called her 'White Heather.' I give her portrait, and a capital specimen of a terrier too.

"I bred a white Scottish terrier dog, called 'White Victor,' from a prize-winning dark strain and exhibited him among the dark-coloured dogs at the Edinburgh Kennel Club Show, in 1895, and he got 'V.H.C.,' so that he was evidently a Scottish terrier according to the judge's opinion.

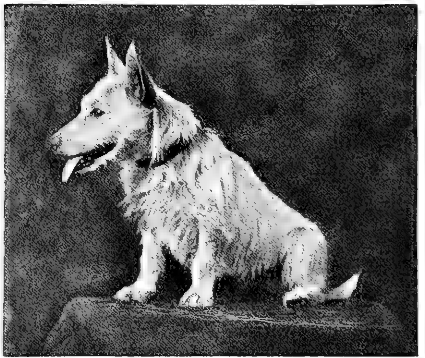
"The old 'tod hunter' or 'fox catcher' in the Highlands, years ago, made his living by killing foxes and otters, and anyone who has been at this exciting sport must have observed how easily white dogs, when working the cairns, can be seen. Hence white and creamy-coloured terriers were used by these old sportsmen. 'Tod hunters' had little chance of attending dog shows and arranging among themselves as to what types were best. All they wanted was a dog which could tackle and bolt the


PUPPIES SIX WEEKS OLD.

foxes, otters, badgers or wild cats from the cairns.

"A 'cairn' is a heap of stones covering the side of a hill or side of an arm of the sea. In the spaces between the larger stones, weighing from three to twenty tons, the foxes and otters live, and from the cavities between these white Scottish terriers have to bolt their quarry. They sometimes fail, but it is not from want of pluck or staunchness, but the vastness of their task. In fact, it is as difficult a job as can be given to any dog.

"These doggy pictures show that the modern terriers have good long jaws, straight legs in front, hard coats, black noses, and dark eyes. They have also a keen terrier look about them, and if you were to hold open their mouths you would find teeth larger than any other breed of dogs in proportion to their size, as large even as those of collies. The tail ought to be carried gaily. He should be a compact, rather cobby little dog, from about 16 lbs. to 18 lbs. in weight, and look larger than he really is. He should be short in the back. His ears should be sharp-pointed, carried bolt upright and placed closely together. They are very hardy, can take care of themselves, and make capital companions, either in or out of the house. They are sportsmen of the highest order, not quarrelsome, but fit for any work either with the gun or without.

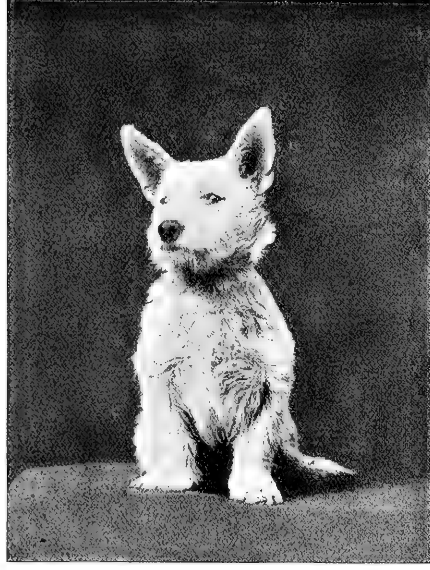

FULL-GROWN WHITE SCOTTISH TERRIER.

PUPPIES SIX MONTHS OLD.

"The puppies when born are very interesting. At first their ears are found dropping over the skull, as in the picture, and as they grow older they gradually assume the erect carriage which gives them a sharp expression. The colour of their noses is pink at first, as is also the colour of their pads. After three weeks, however, these colours change, and we find the nose and pads gradually assuming a black colour. The eyes when open are dark. I have never seen a light-coloured eye in any of the white specimens I have bred so far.

"Hard coats are more prevalent in the white variety than in the dark. These beautiful little dogs have now been recognised by the English and Scottish Kennel Clubs as a separate variety, and they have been given classes all to themselves. Specimens true to type have been exhibited for some time in London shows—notably at Cruft's and the Crystal Palace—and in Scotland, at Edinburgh, where they attracted a good deal of attention.

"From the results I have obtained in breeding these white terriers, I feel certain that it is quite possible to breed them pure white, and that anyone who is interested in breeding animals and possesses at the same time a few of the qualifications of a breeder can obtain, in the breeding and rearing of white Scottish terriers, endless amusement, constant pleasure and gratifying success."



"TINY."

I do not think I need add much to the foregoing sketch of this charming variety, but I may say that the first real Scottish terrier I ever saw, when I was a school boy, was exactly the type and style of "White Heather," illustrated in this article, of a very pale oatmeal colour, and belonged to the late Captain N. Phillips, of Whitson Court, Monmouthshire, who told me he bought him in the Highlands. In the course of my judging experience I have had "White Heather," before mentioned, and others of her colour belonging to different exhibitors—Messrs. Arthur Maxwell, of Darlington, Phipps, of Weston-super-Mare, and others whose names I forget—before me, as well as the dogs of most of the persons whose names I mentioned in the first part of this article, and I have little doubt that in the future, as dogs of this colour become more known, they will increase in numbers and popularity.

ANIMAL ANECDOTES.

Do Animals Commit Suicide?

THE following case would seem to prove fairly conclusively that grief often leads animals to attempt suicide. A great Dane dog was abandoned by the family to which he belonged. For a week or more he roamed about the neighbourhood, vainly seeking his protectors. The cook in a restaurant fed him well, but no one cared to give him a home. One morning he appeared in front of the house where his family had lived, ran up the stairs, and leaped from an upper window to the street. He was so badly hurt by the fall that a policeman shot him. Investigation proved that neither by word nor by gesture had anyone in the house threatened him. No one invited him to leap down, nor was there anyone in the street resembling any member of the family which had deserted him.

How a Terrier Saved a Child's Life.

MR. G. FINLAY, of Leith, relates how his dog once saved a child's life, he says: "I had a Yorkshire terrier which used to accompany me in many of my walks. One day while walking along a street with it, I stopped to look at a shop window. Behind me on the pavement there was a trapdoor to a cellar, which was open. A man was carrying sacks of coal from a cart and emptying them through the opening. Hearing my dog barking I turned round and saw it pulling vigorously at the coalman's trousers and trying as hard as it could to keep him from the trapdoor. Wondering what was the matter with the dog I looked into the cellar. Imagine my surprise to see a child lying stunned on the coal. It had fallen down while the man's back was turned, and the dog, noticing it, had endeavoured, and successfully so, to keep the man from putting coals on the top of it. The child was taken out and carried home and quickly recovered. If the man had emptied his coal on the top of it, it would have been killed, but fortunately, and to its parents' joy, my dog saved its life."

An Intelligent Thief.

AN elephant was chained to a tree one day, and its driver made an oven at a short distance in which he put some rice cakes to bake, and then, covering them with stones and grass, he went away. When he was gone the elephant unfastened the chain round his foot with his trunk, went to the oven, uncovered it, took out the cakes and ate them, covered up the oven again with the stones and grass and went back to his place. He could not fasten the chain again, so he twisted it round his foot in order to look the same; and when the driver returned was standing with his back to the oven.

Quite a Hero.

A SAILOR retiring into private life after his last voyage brought home a small monkey, which soon became the pet of everyone. This animal's greatest friend, however, was a cat, which he seemed to think it was his duty to protect, as well as her little family of four kittens. One day the barn in which they were housed caught fire. Nick (as the sailor had named him), instinctively scenting danger, took up a kitten in each arm and made for the door, the cat following his example with one in her mouth. As soon as they were safe Nick bravely fought his way back to rescue the other, but he never returned. The brave little fellow perished in the flames with the one he tried to save.

The Ostrich as Watchdog.

THE owner of an ostrich farm in Florida has a good watchman to guard his stock. He has trained an ostrich to act in that capacity, and the bird patrols the farm and gives at intervals a cry that may be interpreted to mean "All's well!" If anything frightens him, he at once communicates his alarm to his companions by a series of yells as he advances to the attack. He is a bird of unusual intelligence, but is very savage. At night it is especially dangerous to go near him, and to see his keeper force him back to his pen in the morning is one of the sights of the farm. A large fork is the keeper's weapon, and before it the bird slowly gives way, screeching with rage and striking out with his feet. One night the ostrich caught a thief. The farm hands were all asleep, when there arose a terrible hubbub, which, as the men became sufficiently roused to distinguish sounds, resolved itself into the angry cries of the bird and the shrieks of a human being. Rushing to the pen, the men

saw the ostrich chasing a negro. The fellow had come to the pheasants' quarter to steal, and had been discovered by the bird. When he tried to get over the fence the bird struck him a blow on the thigh which cut his leg to the bone, and it was only the ensuing noise which saved his life.

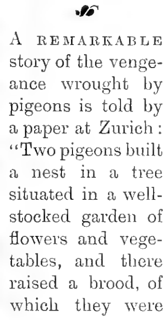
The Rat and the Monkeys.

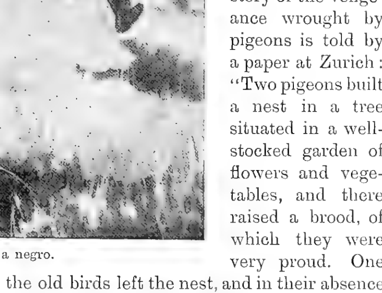
At one of the zoological gardens on the Continent a cage of white rats stands quite near a cage of monkeys. The monkeys had always shown so much curiosity about the rats that the keeper decided to put one of the rats in with them to see what they would do. They screamed with delight when the rat entered, and began to make friends with him. The rat was inclined to run away from them for the first day or two, but seeing they did not intend to do him any harm he lost his fear and permitted them to fondle and caress as much as they liked. This they did constantly, stroking his fur, holding him in their arms, and offering him part of their food. One day a new idea occurred to the oldest monkey. He had the rat in his arms, and putting it down gently on the floor of the cage he very cautiously sat on it. The rat did not move, nor did it seem to object to the queer use to which the monkey was putting it. After sitting there for awhile, the monkey got up so that the others might try it, and they were all as pleased as he had been. From that time on the rat was in daily use as a cushion, and as the monkeys were invariably kind to it, the keeper allowed it to remain in their cage. This strange performance became one of the sights of the garden.

The Ostrich chasing a negro.

An agile Ox.

An ox is about the last animal which would be looked upon as a performer of considerable activity, and yet, as the following proves, it can be taught a certain amount of agility. A lieutenant of a cavalry regiment in Berlin succeeded in so training an ox in six months that it would obey the word of command like a cavalry horse. At a recent trial of its powers, which took place on a drill ground, the ox trotted, galloped right, galloped left, and imitated the horse in almost everything except vaulting, which was beyond its capacity. The officer was highly complimented on his perseverance and success in training so unpromising an animal.





Vengeance.

A remarkable story of the vengeance wrought by pigeons is told by a paper at Zurich: "Two pigeons built a nest in a tree situated in a well-stocked garden of flowers and vegetables, and there raised a brood, of which they were very proud. One day the old birds left the nest, and in their absence someone captured the young ones. On their return the hen was much upset at her loss. The cock, however, went and fetched about fifty other pigeons, which actually devastated the garden, the vegetables and flowers being destroyed in wholesale quantities."

NOTES AND COMMENTS.

Otters.

The following is quoted from Mr. Aubyn Trevor-Battye's contribution on Otter Hunting to "Lord Lilford on Birds."* The extract gives an excellent character sketch in few words of an interesting little mammal:—

Otters are great travellers, ranging very far up and down stream on their nightly quests. They swim very quietly, slipping into the water as if it were oil. Though you listen never so carefully, you do not hear much that tells you the otters are moving, excepting a sort of "whistled" call, which comes now and then from the reed-beds. Masterly as the otter is in the water, supreme as are its powers of swimming and diving, it no more cares for unnecessary hard work in its hunting than other animals. When going up stream, especially if the current is swift, it frequently lands, and often cuts the bend of the stream by travelling across the land from corner to corner. A practised eye will easily notice these spots where the otter lands and runs up the bank; for otters, like most other wild creatures, follow one another's lead. Causes which the blundering eyes of humans may not detect are no doubt answerable for the claims of one landing place over another. It may be the set of the eddy from a half-sunk willow stub, the angle at which the bank rises, the chances of cover and concealment—any one or all of fifty points may determine the advantages of a particular landing place. But at all events it will, if otters are abundant, be paddled into a regular run. Here you will see the otter's footprint in the mud, the prints of four round toes like no other creature's track. This footprint is called by otter hunters, the "seal." Other signs, such as remains of digested food (in hunting parlance "spraints") will be noticed on hillocks of the grass or on stones which show themselves above the water. Although some streams are more favoured than others, there is probably not one in the country that is not visited at times by otters, and the attention of even unobservant persons is occasionally arrested by the spectacle of a partly-eaten fish lying on the bank. The otter first begins to eat those parts about the head, except when dealing with an eel, when it commences with the tail end. Because of its cautious and secret manner of life, an otter will often continue to frequent a stream for a long time, and be unsuspected. Indeed, many a stream has held otters from time immemorial, and yet no one has guessed this, until the coming of a pack of otter hounds has "shown the varmint up." Even that omniscient person, the dusty miller, in spite of his peculiar opportunities, was scarcely prepared to find in the thatch of his own outhouse one of its favourite sleeping-places. Yes, otters often choose strange quarters, and though their usual "holts" are drains, caves, rocks, holes under tree roots, and withy beds, we have known one to frequent an ivied tree, and have bolted another from under a barn floor.

Photo by the Scholastic Photographic Co.
SHORT-CLAWED OTTER.

Mr. Trevor-Battye has no easy task before him in confining within one volume of the Woburn Library a work on British Birds, but if it is written as interestingly and concisely as the above extract we can heartily congratulate his readers. Sir Harry Johnston's volume on Mammals will be ready shortly.

* "Lord Lilford on Birds: Being a collection of informal and unpublished writings by the late President of the British Ornithologists' Union, with contributed papers upon Falconry and Otter Hunting, his favourite sports." Edited by Aubyn Trevor-Battye, M.A., F.L.S., F.Z.S., etc., with drawings by A. Thorburn. 1 vol., 16s.

Photographs by N. Lazarnick, New York

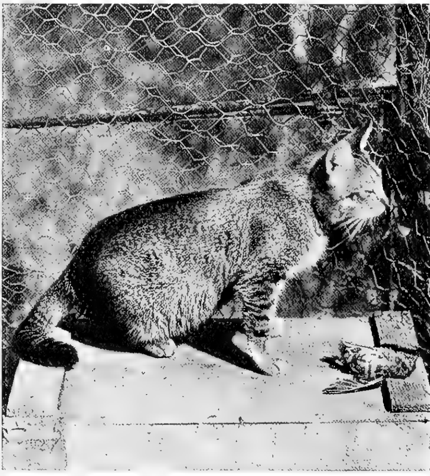
TWO CAST-UPS ON THE SHORES OF CALIFORNIA.

Domestic Cats.

It is probable that the common domestic cat is mainly derived from the *Felis chaus* of Africa. A noticeable reversion to the original type is to be found in those cats commonly known as Abyssinian or Bunny cats, many of which exactly resemble what one would reasonably expect the Egyptian cat to become after some generations of domestic life. We recently saw an excellent specimen of exactly the colour of a *Felis chaus*, even carrying the resemblance so far as to exhibit on each ear a tiny tuft of hair, which is seen in the Chaus cat, and marks the gradual approach to the *Lyncine* group.

A pretty group of departed stars of the catty world is depicted on the opposite page.

These cats were Manx Champion "Katzenjammer," Manx Champion "Bonhaki," and the Abyssinian "Sedgemere Peaty." Since "Peaty's" death, no really first-class Abyssinian has been exhibited in this country.



BUNNY CAT.

There is a very great difference between a Manx cat and a tailless cat, though the difference does not seem to be appreciated by certain "judges" who gaily award prizes to cats wofully lacking in Manx quality, if only they are large and well-marked. Of late years, however, Manx owners have livened up, and competent judges have more often been appointed. A great characteristic of the Manx is its immense length of hind-leg, which gives it a rabbit-like appearance, especially when in motion. This is excellently shown in our portrait of "King Clinkie," Mrs. H. C. Brooke's Manx, which won two first prizes and the championship at the last show held by the National Cat Club.

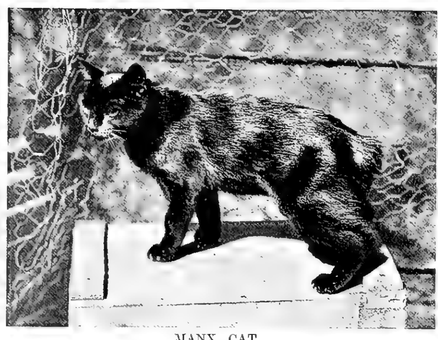
There is, of course, no breed of cats indigenous to Australia, but, amongst others, a strain of cats has formed itself exhibiting very marked characteristics which, however, lead us to agree with an American author who asserts the probability that they are derived from imported cats of Eastern origin, possibly Siamese. Very curious is the little grey spotted cat here shown, though unhappily the position does not bring out his great length of hind leg nor his peculiar rather long and tiger-shaped nose, which, seen sideways, gives him a queer expression. He has, like his mother and his brothers and sisters, a triple kink in his tail.

For all the photographs of cats on these two pages we are indebted to Mrs. H. C. Brooke, who kindly allowed her pets to "sit" to our photographer. The group of champions, however, is from a photograph lent to us by their owner; the three others were taken especially for Animal Life.

A Cat's Idea of Discipline.

Apropos of cats, the following story sent to us for publication by a correspondent is interesting as an example of animal ethics. We regret we have not space to give a reproduction of the photograph sent of the kitten whose mother showed she held such very decided opinions concerning parental discipline, and the right, where necessary, of inflicting corporal punishment. Our correspondent writes: "I called the kitten, who sprang from the basket where she had been lying with her mother and followed me into the next room. The cat followed, growling warningly, and, taking it up by the neck, replaced it in the basket. Again I called it, and again it came at my call.

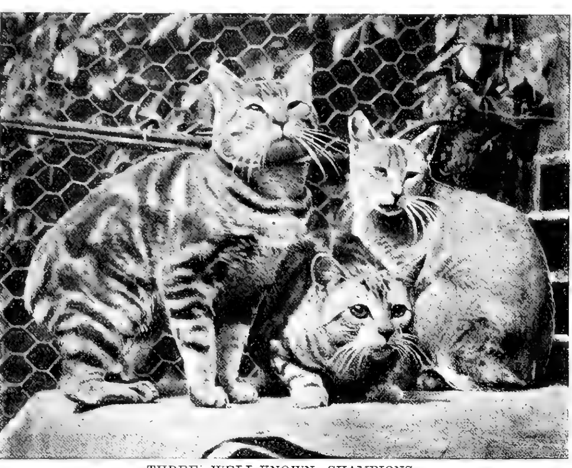
This time the mother growled still more threateningly, followed us again; but this time she seized the kitten by the tail instead of the neck, evidently as a punishment, and pulled it roughly along, the kitten mewing helplessly. For the third time I called, and once more it came to me; but this time the mother was silent. She came, took up the kitten, dragged it off, and then began to bite it again and again in order to secure its obedience. This method was successful, and the next time I called, it was in vain."



MANX CAT.
"King Clinkie."

The Cat and the Frogs.

ANOTHER correspondent tells the following new and striking story :—" A naturalist in Aberdeen has a cat which, for her many funny tricks, he highly prizes. The savant keeps many creatures in his museum, and among them a tubful of frogs in about four inches of water, with projecting bricks on which they can come up and sit. Almost every day the cat seats herself by the water in the orthodox cat attitude, and, having collected the frogs in a huddle before her, she amuses herself with their gambols. If any of the little reptiles get out of proper view, she gently touches it into position with her paw and thus keeps her actors on the stage. She will often sit for half-an-hour mentally smiling at the frolics of these agile acrobats."



THREE WELL-KNOWN CHAMPIONS:
"Katzenjammer," "Bonhaki," and "Sedgemere Peaty."

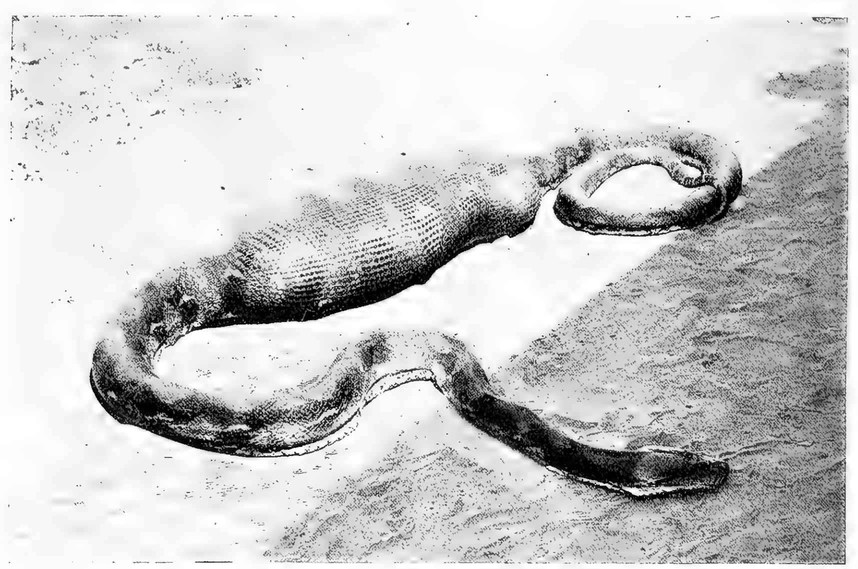
Snakes.

THE island of Java, the pearl of the Dutch East Indies, is the home of the Anaconda. The one shown in our illustration was found near Batavia, quietly digesting a wild boar which it had caught and swallowed. The wild boars of Java, which are found in great numbers, are very much smaller than European boars, and are easily overpowered

AUSTRALIAN CAT.

by the anaconda, which secures its victim with its teeth, at the same time coiling itself round the animal and so crushing it to death.

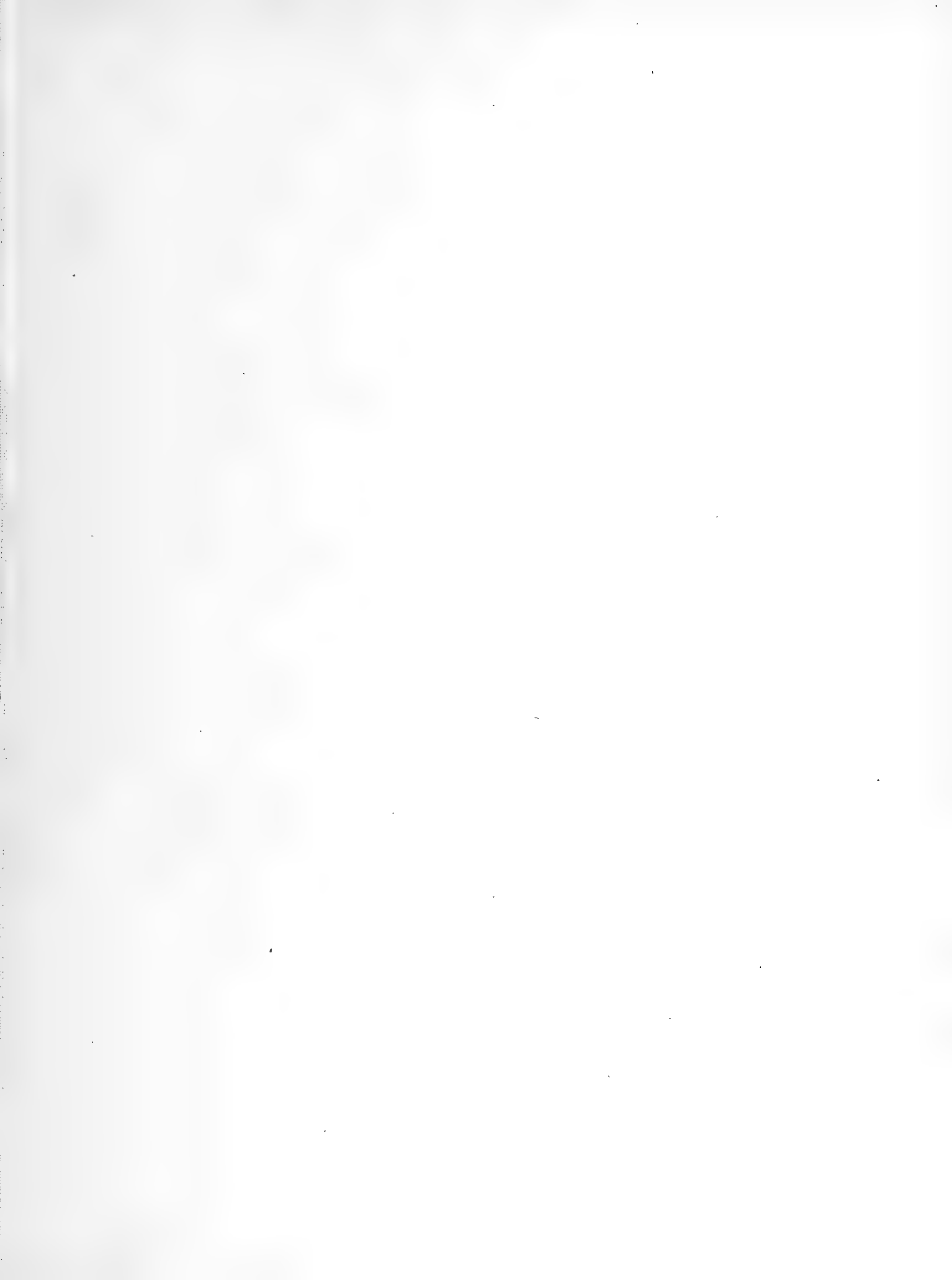
Apropos of snakes it may be interesting to note that there was an increase in the number of deaths from snake bites, etc., in India during 1901. According to the returns published recently snakes are said to have killed 22,810 persons that year, as against 22,393 in the previous year. Here, too, may be mentioned the fact that an increase is also indicated in the number of deaths from wild animals in India. It appears that these accounted for some 1,859 human beings between January and December, 1901, as against 1,429 in 1900. Tigers are the principal offenders, having killed no less than 1,171 persons, of whom 162 lost their lives in a single distiict of the Central Provinces.

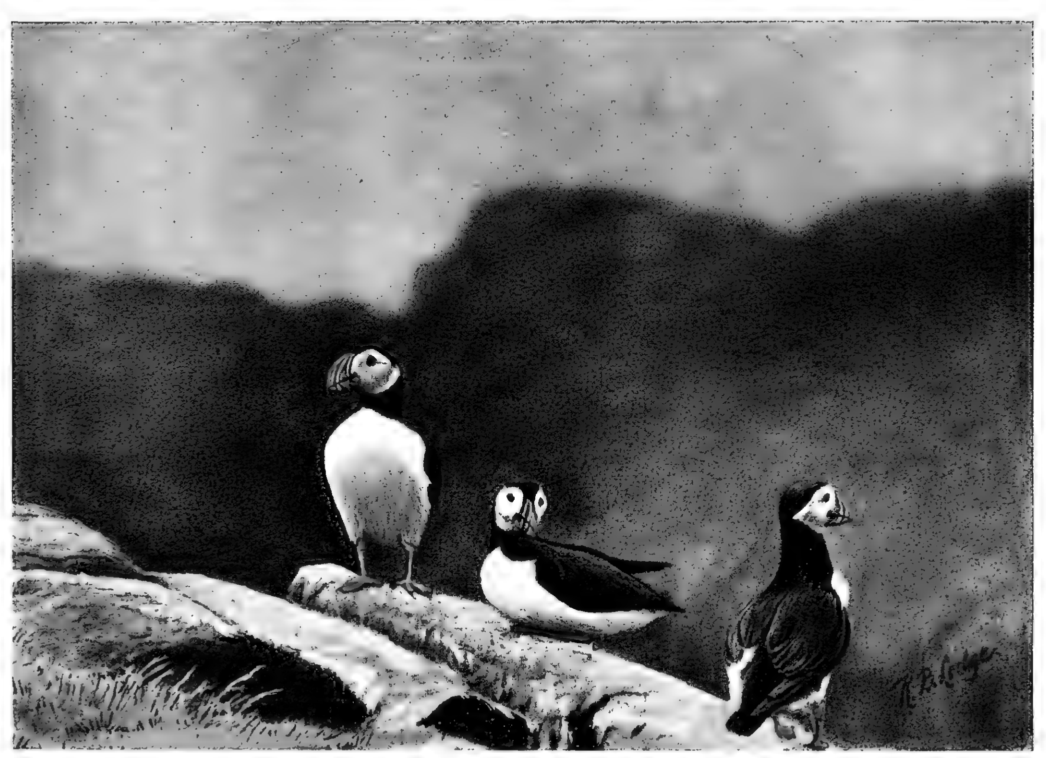


ANACONDA AFTER SWALLOWING A WILD BOAR.

Hybrids.

A CORRESPONDENT writes from Wimborne: "A very interesting and uncommon hybrid can be bred from a hen Pheasant and a cock Bantam. The eggs should be hatched under a hen bantam, as a pheasant will very rarely sit in confinement. The hybrid is of a better colour if a pure white pheasant can be obtained. The young are rather delicate, but can be reared like ordinary fowls with the addition of a little animal food, such as ants' eggs when fresh." We have heard of a cock pheasant breeding with a farm hen, but this is the first time that the case of a hen pheasant taking to a bantam cock has come under our notice. Perhaps some of our readers could tell us of other interesting hybrids.





PUFFINS (*FRATERCULA ARTICA*).

From a photograph from life by R. B. Lodge, Enfield.

Photograph by C. Reid, Wishaw, N.B.

BADGER.

BADGERS AND FOXES IN SCOTLAND.

By J. H. Crawford.

THE badger is sometimes called our native bear, and he is the nearest approach left to us since the brown bear was stamped out some centuries ago. He plants the whole foot on the ground—for that matter, so do we—and in disposition and some of his habits he is not unbearlike. Certain other hints link him more closely with the martens and weasles, notably the gland near the tail, of which the pole-cat or foumart (foul marten) makes such vile use. In many ways he may be looked upon as an intermediate form, and somewhat of a survival. Like the hedgehog and the mole he holds on by living mainly out of sight.

Over the central lowlands and low eastern coasts of Scotland he is fairly generally distributed, and, though unevenly reported, is probably very much more common than the man in the street or on the high road is aware of. Only night wanderers like himself stumble on him and hear his grunts. "The sun went down, the mellow thrush was now silent, the wood-pigeon had uttered his last coo, the owl began his doleful and melancholy wail, the night-jar was still out with his spinning-wheel, and the lightsome roe, the pride of the lowland woods, was emitting his favourite night-bark. What could the hideous-looking monster be? He could not see clearly, for it had become dark, and the moon was not up yet. At length the animal gradually approached him. He now observed that it consisted of three large and full-grown badgers, one behind the other." It was not the first time these hoary patriarchs had been abroad, but it may well have been the first time they were surprised—and the surprise was mutual.

Some mild February day he crawls forth, stiff with long lying, and ravenous from his fast. "I have changed my opinion as to the harmlessness of the badger," says one who for some years past has had a colony under close observation. Only he is such a slow, dull brute that what he takes must first come in his way, or be unable to get out of it. There is infinitely more mischief in an aggressive animal—a stoat, for instance—one-eighth of his size. In autumn he leads a life of innocence, and even usefulness, on honey and the larvæ of insects. "If he were encouraged he might be trusted to keep down the wasps," writes another close observer of his ways. In

grubbing after these, and the starchy roots of plants, he turns over sheet after sheet of moss, to dry in the sun and make "badgers' hay," from which he carries as much as will make his winter home snug.

The "earth" is, if need be, in the depth of shade: by preference, on some wooded slope facing the sun. Here he seems to dwell, mainly in colonies, whose limits may in some cases be set by the nature of the surrounding soil and the difficulties in the way of further extension. Lord Rosebery brought some badgers from his estate in Buckinghamshire and turned them out in the Dalmeny Woods, near Edinburgh. They increased to some twenty individuals, after which the younger members went off to set up for themselves. Some seem to have gone far afield, and helped to restock the district for many miles around; at least, every badger that turned up where no badger had been before was traced back to the Dalmeny colony. A few took possession of some foxes' earths not far away from home; badgers are in the habit of thus dropping in at an open door.

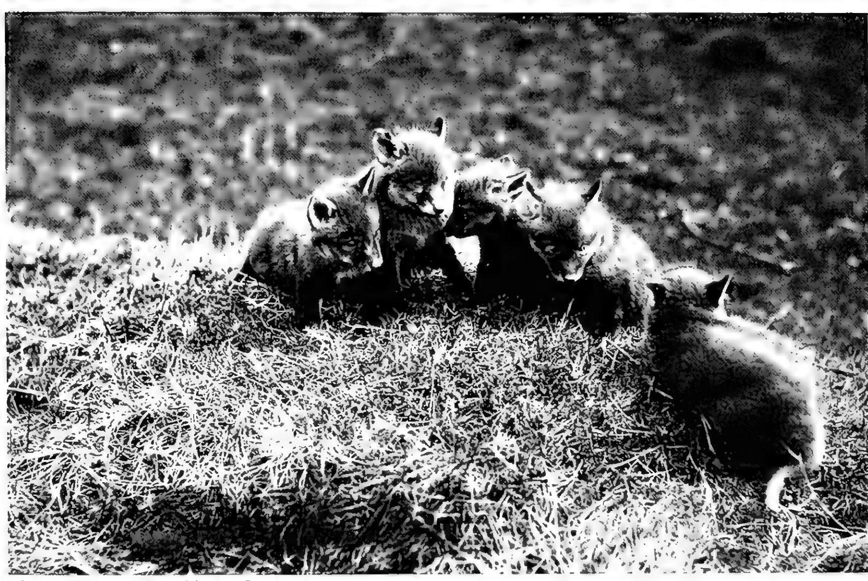
The lowland fox returns the visit. He is notoriously averse to digging for himself if he can at all avoid it. An old drain, or other opening in the soil, or cleft in the rock—anything will do. A rabbit's hole is at least a beginning, and a badger's earth is better than all. It is more comfortable than a drain, and less trouble than a rabbit's hole. It is just the proper size, and might have been made for him. In addition to the mere convenience there may be a certain natural affinity. The two seem to arrange the matter quite amicably. When the sharp nose appears at the opening the inmate grunts and makes room, as if he knew he must come sooner or later, and was on the outlook. He will even dig further back, that the guest may be more comfortable. There is no rivalry to cause friction; the two do not cross each other's path. That there is a little benefit to the host is probable. Anyone who has seen a fox's hole will remember the débris of fur and feather round the opening. And the badger may well owe a meal to sharper wits and longer legs and further raids than his own. So Reynard may pay for his quarters.

Photograph by Ottomar Anschutz, Berlin.

EUROPEAN BADGER.

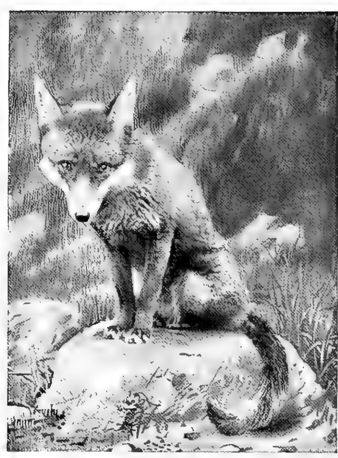
In the Highlands the badger has not been followed by the relentless persecution that has played such havoc with the wild cat and the marten. He is not included among the active enemies of game, to be got rid of by every means. If met with he is probably knocked over to keep the shooter's hand in, or because he is too big and tempting an object to let pass by the muzzle of a gun; but the meetings so seldom take place that they do not count for much. Perhaps he is the only wild mammal of anything near the size that enjoys the happy medium between persecution and protection. He may get into traps set for something else; but the traps must first of all come to him, and, as his is a secluded way, lying pretty near home, he generally manages to escape such risks. And should he by any chance blunder into the neighbourhood of traps, and the bait should lead him into temptation, he has a happy knack, unknown to the wild cat and the marten, of getting what he wants and keeping his foot out. And so it happens that keepers among the Grampians and further north tell you, as a matter which does not concern their efficiency as game

A FOX FROM SCOTLAND.



Photographs by C. Reid, Wishaw, N.B.

FOX CUBS.



Photograph by J. W. McLellan.

COMMON FOX.

preservers, that the badger is found on their estates often in considerable numbers.

He is given to climbing up the hillsides and creeping under any piles of stones he may find. One naturalist and heather laird talks of him as a common tenant of the topmost pile of all, placed on the misty summit for the guidance of whomsoever is wont to be abroad. Each rocky cairn capping the Glenfalloch range of the Grampians has its family of badgers. They seem to prosper on the foggy ptarmigan ground immediately beyond the heather and the grouse. Up there he can do little mischief even by chance; he may grub a long time ere he comes on one of the few scattered nests of the white grouse. His use and wont title to his tenement is seldom disturbed, except when the mountain fox, in spring, takes forcible possession, or without force simply enters and becomes a lodger in the pile, as the lowland fox in the earth of the lowland badger. The fox does not climb so high, stopping short of the lonely summit cairn and the bare ptarmigan ground. His diet is more restricted, grubs and honey being of little use to him, roots still less. With five hungry little ones to look after he wants to be down where the blue hares—which form his staple diet—feed on the tender heather tips in the zone of the red grouse.

If there is no difference between the hill badger and the plain badger, seeing that he lives, unchanged, his dull, slow, hidden life, the same is not quite true as between the foxes. Though not to the extent of forming a new species, the mountain fox has been changed by his habits and moulded by his surroundings. It could not well be otherwise. The cub of a mountain fox will be a mountain fox in his turn; born in a chance pile on the hillside, he will breed in such another; and reared on mountain fare, he will feed on the same. Along the lower margin of his domain he may cross with the lowland fox, but only as the mountain hare may—on rare occasions, it is said not at all—cross with his relative of the plain. Be that as it may, he is the nobler animal. He stands higher on his legs, is bigger, broader in the head, bushier in the tail. One describes the foxes of the broken Sutherlandshire country as almost as tall and powerful as greyhounds. He is not a sneak. There are no hen-houses about where an easy meal may be had, so be he can hoodwink the good wife of the cottage, nor pheasantries, nor other incentives to low cunning. He feeds on the open, where his quarry have learned, in the same hard school, how to look after themselves, and have, at least, an equal chance with him in the game. He differs almost as widely as the wild cat from the tame cat, and, curiously enough, in some of the same ways.

Photograph by J. W. McLellan.

COMMON FOX.

There is no wild animal better able to look after itself. He is a rascal. He takes lambs in the spring, and game in the summer. He kills more than he can eat, hiding what is over against another time, nor troubles to return so long as he can get anything fresh to kill and hide again. Every man's hand is against him. But shepherd and keeper alike are at their wits' end; he is a match for both of them. He is hard to outwit with a bait, and when caught he chooses the heroic remedy of biting the leg through, leaving the foot, and as much more as need be, in the trap. Nothing is left but a chance shot, and that is just what he will not give, or not very often. He usually sees before he is seen, and the only view of him is as he goes out of reach at his easy gallop. Were any other native wild animal to give an equally good reason in its bad conduct, it is not too much to say that it must soon cease to exist; yet this ruthless destroyer, well-nigh as bad as the wolf, continues to hold the mountain fastnesses and moorlands in practically undiminished numbers. The lowland fox thins out rats, voles, and other field pests. But he has

Photograph by Ottomar Anschutz, Berlin.

EUROPEAN FOX.

no such plea. The one service is that he keeps down the blue hares, which disturb the birds by their strange antics, and, where they increase too rapidly, are apt to be troublesome to the sportsman.

Stepping across the lowlands to the southern uplands and the wilds of Eskdale and Liddlesdale, we find the badger in possession as in the never-to-be-forgotten times of Guy Mannering. There was no difficulty in finding one at Charlie's Hope to test the metal of the two redoubtable ancestors of the breed—since called "Dandie Dinmont," after the farmer himself, no less—as on that memorable occasion when, in the draw, "Pepper" lost his fore foot and "Mustard" was nearly throttled. The mountain fox, too, is still as numerous as when almost every farmer on the border-land had a pair of large fierce greyhounds—of the race of those deerhounds formerly used in the country—and set aside a day to settle accounts with the marauders anent certain lambs that could in nowise be found.

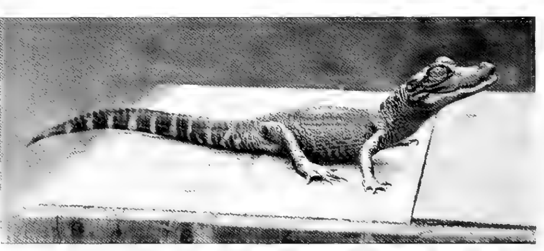
UNCOMMON PETS.

A series of articles on the Care and Keep of Animals in Captivity.

By P. Wellington Farmborough, F.Z.S., F.E.S., etc.

III. CROCODILES AND ALLIGATORS

REPTILES are splendid pets for lazy people, for the simple reason that the amount of neglect and inattention they can put up with is almost incredible; but by this I do not mean studied neglect, but the neglect which unfortunately falls to the lot of the pet the interest in which has waned in its owner's mind. Crocodiles and alligators form very great objects of attraction to visitors at a house where these reptiles are kept as pets, and when the writer was possessed of some of these creatures his friends were continually asking how they were fed? How long did they live? Did they bite? and many qestions of a similar kind. Young alligators can be bought very cheaply from most animal dealers, ten shillings being a very fair price to pay for a small one a foot long; larger sizes are dearer, one a couple of feet long costing thirty shillings or two pounds. Crocodiles are more expensive, and small ones are worth five-and-twenty shillings or more. In this connection it may be worth while saying a few words about the prices of pets. In hardly any other line of trade does the market value of stock fluctuate so much. Naturally in the first instance the prices are regulated by the law of supply and demand; but there are many causes which alter the value. One man has, say, a thousand pairs of birds which he expects to arrive by a certain ship. Perhaps, owing to bad weather or from some other cause, half the birds die; what are left represents the capital the dealer has invested in that particular venture, and he sells accordingly.



A PET ALLIGATOR.

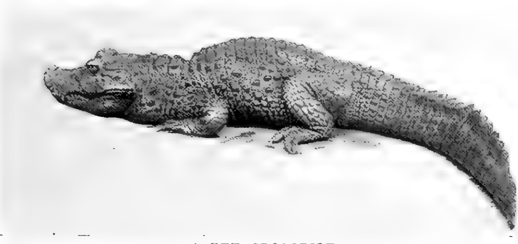
But to return to our alligators. Before bringing the saurian home it is necessary that its permanent habitation be prepared in readiness for its reception beforehand. A handy size will be from three to four feet in length (preferably the latter), about eighteen inches high, and the same in width. It will be found more convenient to have the back hinged so as to open in one piece rather than have a small door cut in. A small strip of perforated zinc let in at the top serves for ventilation. A shallow zinc tray two feet in length for a three-feet cage, or thirty inches for a four-feet cage, must be made by a tin-worker to fit accurately in the width of the case when the door is closed. The cost of this tray will be very little—the writer was charged about half-a-crown for his. There is no necessity for this tray to be a deep one, three inches being ample. The remaining space between one end of the tray and the end of the cage can be filled in with large stones. At one time the writer used virgin cork for this purpose, but he found the stones preferable, as although the cork was warmer it harboured insects, and unless frequently renewed was more bother than it was worth. A small strip of wood as high as the tray is necessary at the back of the cage to prevent the stones from falling out whenever the door is opened. Nothing less than plate glass can be used for the front of the cage, for, although the reptile is small in size, a smart flap from its tail would smash ordinary sheet glass into pieces in an instant.

For small pet-keepers who are restricted to space and cannot provide larger accommodation than the size of cage mentioned, one alligator makes a much better pet than two even of the same size, as a couple are very much given to quarrelling, and in their encounters nearly always happen to injure one another.

Rain water is the best kind to provide in the tank, and in any case it must be soft water. Many people recommend that the water be kept heated between 75° and 80° F.; there is no actual necessity for this, although these reptiles, if kept in water heated to about those degrees, are more lively than those kept in unheated water. A warm conservatory forms an ideal place to keep small crocodiles and alligators in, and if a warm-water tank can be fitted in a small enclosure on the ground nothing better can be devised.

The feeding is a very simple matter, the dietary being confined to raw meat and fish, preferably fresh-water varieties. Large pieces of meat are unsuitable owing to the very small throat possessed by these reptiles, and therefore the food must be cut into very small portions. Very small alligators, say those under a foot in length, can be conveniently fed on worms.

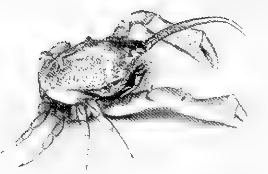
The food should be thrown into the tank, and if not eaten the same day must be removed, as the water would soon become tainted and the meat injurious, and what would in a state of freedom injure the reptiles very little or not at all soon upsets them if in captivity. Crocodiles and alligators are very handy creatures to pose. When taken out of their cage they are always in a tremendous hurry to get somewhere, and if prevented, after a moment cease their hurrying scuffle and remain as stationary as if carved in stone; the small alligator in the accompanying illustration was very anxious at first to run off the box upon which he was placed, but in less than a minute posed himself as seen and did not stir until forcibly removed.



A PET CROCODILE.

The water should be changed at least once a week, and every care should be taken to see that the fresh supply be not given at a lower temperature than that that was drawn off. A slight increase (not more than 10° F.) in temperature does not matter—in fact the reptiles will enjoy the warmer water being poured over them; but a few degrees lower will set the alligators and crocodiles back and send them off their feed for a considerable time. It may happen, too, that when the creature is purchased and brought home it may refuse or at any rate ignore its food for some weeks—in fact the period may even extend into months; there is no need to get unduly anxious, the reptile is only settling down and making itself used to its new quarters. A good way to get these creatures on the feed is to cover their case up with a blanket, or something that lets the light get through, and leave them alone.

I have heard that many people have been successful in hatching alligators' and crocodiles' eggs under broody hens and in incubators, but have never personally had an opportunity of testing the truth of the statement, although the information is well authenticated.



THE MASKED CRAB.

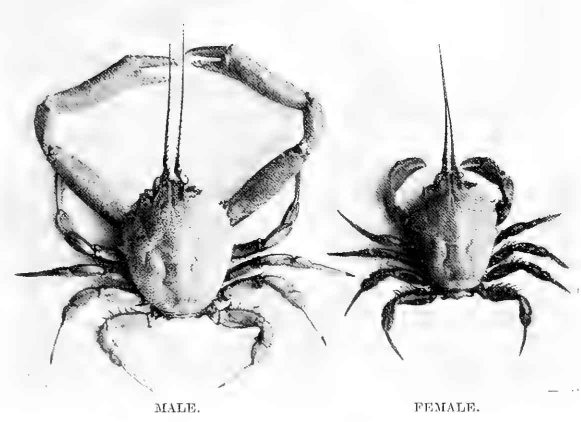
Written and Illustrated with Photographs by EDWARD STEP, F.L.S.

AT no great distance in the past the resemblance to human features on the crab, whose portraits we here present, was considered its most—or only—remarkable character. A nearly-allied British species, the Round Crab, exhibits a similar though less pronounced mask, and in consequence is known along the South Devon coast as the Old-man's Face Crab. Another species with features on its upper crust is known to the Japanese as the Demon-face Crab. It will thus be seen that our Masked Crab is not unique in presenting a caricature of the lords of creation. As a matter of fact there is nothing very remarkable about these false presentments, for the depressions and eminences to which they are due simply mark the areas of the various internal organs, and most crabs exhibit similar sculpturing. The chin indicates the intestinal region, the broad nose and conical forehead cover the heart, the liver lies within the brows, and the puffy cheeks are filled with the gills. The fact that the shell of the Masked Crab is longer from front to back than from side to side, with the consequent modification of the areas mentioned, gives the whole a closer resemblance to the human face.

The really interesting point to call attention to in this brief notice of the Masked, or Long-armed Crab, as it is variously styled, is not this fortuitous likeness, but the remarkable modification of structure brought about by its peculiar habits. To appreciate fully that difference, a living specimen should be examined and compared with a crab of more ordinary form, such as, for example, the common Green Shore Crab. The latter is a very active crab in or out of water. He runs about the edge of the tide, or lurks under stones and weeds, ever on the look-out for any sort of garbage, and willing to give you a practical demonstration of the muscular power contained in his nippers. The Masked Crab leads a life wholly different, and its form has been varied to suit that life. Found only where there are beaches of fine

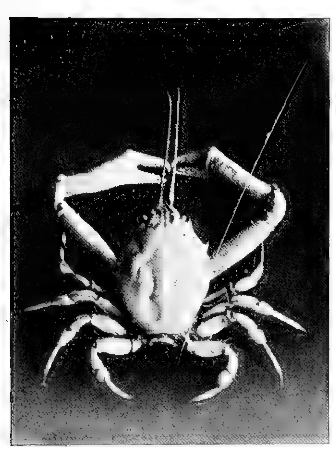
UNDERSIDE OF MASKED CRAB.

sand, it spends its days buried beneath them, coming out at night into the open waters to feed. Its trunk is narrowed in order that it may sink rapidly into the sand, the posterior portion being reduced in thickness with the same object. The extreme joints of the eight smaller limbs are made hard and pick-like that they may begin the excavation; then they are curved to get a hold whilst the long nipper-arms are pushing the trunk backwards and downwards. Thus it will be seen that everything is adapted for a rapid disappearance of the crab, for the sandy flats are much frequented by fishes that would otherwise soon destroy it.



MALE. FEMALE.

The underside of the trunk is clothed with fine hairs, and the smaller limbs are fringed so that when drawn up to the body they prevent the fine sand from passing under the upper crust and injuring the delicate breathing apparatus. In order to ensure a constant supply of oxygenated water for the gills, the feelers or antennæ have been developed to a great length, stiffened, furnished with a double fringe of long hairs, and their basal joints so modified that they may be held out straight in front, when the hairs interlock and form a skeleton tube through which water may pass, whilst the grains of sand are kept back. Thus equipped the Masked Crab can lie snug and safe beneath the sand, whilst the antennal tube keeps open communication with the water above, and the tips being exposed allow sensations of what is happening in the world of waters to be conveyed to the crab's brain.



UPPER SIDE OF MASKED CRAB.

So far what we have described is more particularly the outward signs of the male crab. The female may be readily distinguished by the fact that her nipper limbs are little more than half the length of these organs in the male. Why should this be so? Well, the female is not nearly so active as her mate, and those who have kept her alive in aquaria know that she will remain buried for weeks consecutively. It is probable that she finds the greater part of her food among the sand surrounding her, so the long lever-like arms are not so necessary in her case. Another modification will be found in the so-called "tail." In all the typical species of crabs the last seven joints of the trunk are very thin and bent under the body. In the males these "tails" are of very slender proportions, but in the females they are very broad, forming a kind of pouch in

THE SHORE CRAB.

which the numerous eggs are collected until the time for hatching arrives. Now in the case of the Masked Crab the eggs are sufficiently protected by the retiring habits of the female, so we find that her "tail" is small and not much broader than that of the male. When the eggs are ripe for hatching they are sent up through the breathing-tube so that the young may find themselves in the clear water, free to go whither they will.

Though the Masked Crab is plentiful on our coasts where there are stretches of sand it is little known owing to its secluded habits, but dead specimens may often be found after gales, and living ones may be obtained in plenty by examining the ground-seans which have been hauled after dark.

At the beginning of these notes we have suggested that a comparision of the Masked Crab and the Shore Crab should be made, as the best means of realizing the modifications of form and structure that have taken place in order to fit the former for its special habits. To make this easier for inland readers we give a photograph of the Shore Crab in one of its characteristic attitudes.

PUFFINS.

Our Coloured Plate this month is of birds that may be seen in great quantities on Lundy Island (Lundy means Puffin Island—*lunde* puffin, and *ly* island), where their burrows are so numerous that in some places the soil is quite undermined and almost dangerous to walk on. The puffin possesses the reputation of being the most curious-looking British bird. This is chiefly due to its remarkable beak, which is made even more conspicuous by the brilliant colouration of that organ. The puffin is seldom absent altogether from the British Isles even in winter; but the time when it is most in evidence is from the end of March to the end of August. In severe weather it sometimes travels far inland, and Mr. Howard Saunders recalls a case of a puffin flying through an open window in Brook Street, London.

A LONDON IDYLL.

Being the true story of a remarkable incident in Sparrow Town.

Witnessed and described by SARA SCOTT.

THE Londoner's cheery, chirping, ubiquitous friend the sober-hued sparrow is a past master in all the tactics essential to a conqueror in the hard struggle for existence, and any mere mortal who could furnish him with additional points must necessarily be clever indeed. He is not troubled with the smallest scruple about plundering his neighbour, who straightway sets about snatching a morsel from the very beak of another. And so the eternal struggle goes on, lightened by his cheerful adaptibility and his unlimited capacity for making the best of things. He is a lesson in the practice of many virtues, if somewhat weak in his ethics and unblushingly selfish. But these are only his every-day traits, brought out by the common occurrences of his busy life. In a great crisis, as when suffering or danger attend his offspring, he is capable of a passion of devotion, perseverance and endurance hardly less than human.

The following incident, which came under my own observation, illustrates what may well be called this higher side of his character :—The scene was a shaft-like space in Princes Street, Oxford Street, in which were several back yards belonging to the flats and houses by which the yards were surrounded on all four sides. None of these houses was less than six storeys in height; and as the walls abutting the yards were faced with smooth white tiles they hardly afforded foothold for a beetle, much less a bird. The several yards were separated from each other by the usual wall.

It was here that a youthful sparrow managed by mischance to fall into the space between the two halves of an open window in what seemed an empty flat, whilst apparently taking his first flight. In his ill-judged efforts to free himself he only succeeded in passing below the framework separating the panes of glass, and so became still more securely imprisoned. The accident would probably have remained unobserved had it not been brought to our notice by the loud, distressful outcry raised by his parents when they discovered the critical condition of their offspring. The parent birds

Photograph by C. Reid, Wishaw, N.B.

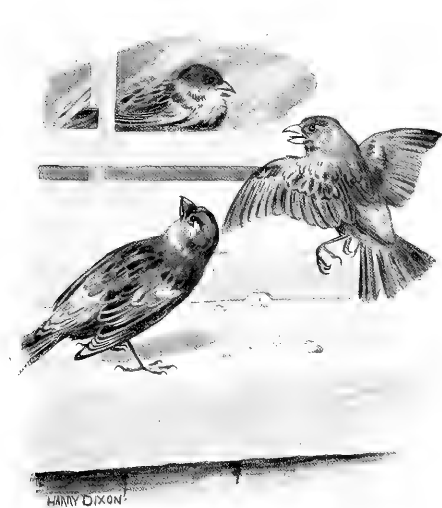
FOUR YOUNG SPARROWS.

made the most frantic endeavours to rescue their young one, but, of course, without success. The framework effectually prevented his rising. We could hear their loud pecks on the glass through which they could so plainly see him, and witnessed their evident puzzlement at their inability to reach him, and, unfortunately, our ignorance of bird language prevented our directing them to the opening at the top. After awhile the little bird ceased his struggles, and lay huddled in a heap at the bottom of the pane as if unable to move.

But the parent birds were not so easily daunted, and after a good deal of chattering consultation they flew away, returning in an incredibly short time with pieces of bread in their beaks, which they tried by turn to put into the open beak of the little bird. But as they tried over and over again to push the bread *through* the glass into the beak, they always ended by dropping the precious morsels. When this happened, without wasting any time in vain regrets, they immediately flew away to their larder for a fresh supply. This was repeated a great many times, but their unceasing efforts to push the bread through the glass naturally always ended in the same disaster. Bread was thrown by the spectators, but the shots were ill-directed and none of the bread reached the famished little one, though some found its way to the window-sill and was quickly espied by the old birds, who thenceforward obtained their supplies without travelling afield.

From this time till night closed in—the accident was discovered about 11 a.m.—varied only by short absences, presumably to attend to the wants of the other members of the family, the parent birds persevered in their anxious efforts till the gathering darkness compelled their withdrawal, and the poor prisoner seemed left to his fate. It seemed impossible that he could survive till the morning; but we were mistaken, and from daybreak the futile efforts of his parents to supply him with food, as well as their loud cries of distress, continued as on the previous day.

Towards noon a servant was observed to enter the room, who, attracted by the outcry, immediately came to the rescue. After giving some food she placed the little bird outside in the yard, where he was at once taken in hand by his parents. He was almost inert through exhaustion and appeared to have injured his wing, and his parents busied themselves for some time attending to his wants. This done, however, their next movements proved that they had had enough of that back yard. They were also bent on carrying their youngster with them. But here they were met by serious obstacles in his weakened condition and injured wing. At first they tried to induce him to fly, but alas! he was too weak to profit by their instructions. After a good deal of chattering persuasion, however, he at length managed to gain the first window-sill, and bye-and-bye the second also; but when he attempted the third the poor little thing failed to reach it, and fell fluttering to the ground instead. Yet in spite of this failure his courage was evidently reviving, and, encouraged by his



"The parent birds made the most frantic endeavours to rescue their young one."

parents' insistent chirpings, he made a second and many other attempts; but he could not succeed in gaining the third window-sill. At this point he always fell backwards to the ground.

It is probable that his wing was still more injured by these falls, and, as evening approached, the old birds seemed to realize that flight was for him impossible.

They also saw possibilities connected with a cistern resting low down in an angle of the wall, and they set about putting these into operation. They began by hopping backwards and forwards to the cistern, chirping loudly the while in language which their invalid understood, and which said as plainly as possible: "This is the way to freedom, walk in it," and at length the pluckly little one tried to imitate them. He made many failures, but at last he actually succeeded in gaining the cistern. By this time night was closing in, and nothing further was seen or heard of them.

"Do just what I am doing."

On the third morning the adaptibility and practical wisdom of the wise old birds was displayed in such a remarkable manner that it was impossible to doubt that the scheme which led to deliverance had been fully thought out.

Hanging from the roof of the house to the ground in the next yard, and in an angle only a few feet from the cistern which had proved so useful, was a very thick rope attached to a lift, and to this rope the parent birds made frequent excursions. Gaining it, they would make short upward climbs, looking back and chirping loudly the while and repeating the chirping each time they returned to their invalid resting on the cistern. Nor were their lessons thrown away, for bye-and-bye he too was seen flutteringly clinging to the rope.

The excitement of the old birds was now boundless. One mounted the rope ladder in front, looking back to give screaming instructions which we interpreted into: "Do just what I am doing, it is very easy!" the other bird meanwhile mounting the rope below, and sometimes hovering round, vociferously seconding its mate's efforts.

It was easily seen that the trembling little one maintained it's position on the rope only with great difficulty; but he never quite let go, though he repeatedly lost ground. Nevertheless, on the whole he gained, though very slowly.

The tender, persuasive lessons by the parent birds were repeated over and over again; and over and over again was the battle for the little one's life almost lost. Yet they never appeared to lose hope; and as for the little one, his courage and endurance in his wounded condition was truly heroic. The persuasive flutterings and chirpings of the anxious parents continued without intermission, as if they fully recognised what failure involved, and without doubt nerved the invalid to greater efforts, for soon after mid-day the heroic trio were observed to be nearing the top of the rope. Ascent was now quicker; they rose higher and higher till three o'clock, when success crowned their efforts, and they finally disappeared over the roof, just fifty-two hours after the accident was discovered.

ZOO NOTES.

Described and illustrated with Photographs

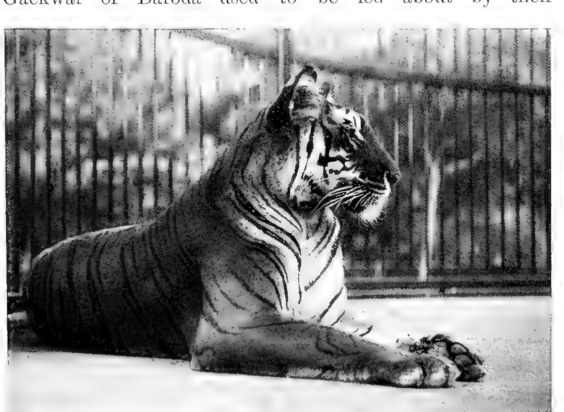
BY

F.Z.S.

JUST AWAKE.

Man-eating Tiger of India.

The Tiger is the largest and most dangerous of the *Felidæ*, slightly exceeding the lion in size, and far surpassing him in destructiveness. The average length of a male is twelve feet from tip of nose to end of tail. The tiger is the only member of the family ornamented with stripes across the body; this is a protective marking, rendering the animal inconspicuous among the reeds in which it generally conceals itself, and where it would be seen with comparative ease if marked in any other way. Although possessed of immense strength and ferocity, the tiger rarely attacks an armed man unless provoked; but it frequently carries off women and children. When taken young the tiger is capable of being tamed. The pair of adult animals which were presented to the Zoo by the Gaekwar of Baroda used to be led about by their attendant in the streets of that city; and Sir James Outram once possessed a male which lived at large in his quarters and occasionally accompanied him in boat excursions. That greatest of all animal trainers, Carl Hagenbeck, it is needless to say, possesses one or two of these "pets," and has even persuaded some of them to mate with lions. Another tiger collector, of course, is Madame Sarah Bernhardt.



A SIESTA.

The Dingo.

The Dingo is remarkable as being the only mammal found in Australia which is not a marsupial. In all probability it is an importation, and not a true native of the island. Many attempts have been made to exterminate the race on account of the great havoc among the sheep which even a single dingo will commit, and they are now only to be found in the interior. Sir John Sebright kept a dingo for about a year almost always in his room. He fed him himself, and took every means he could think of to reclaim him, but with no effect. He was insensible to caresses, and never appeared to distinguish Sir John from any other person. The dog would never follow him, even from one room to another. Wolves and foxes have shown much more sociability, and the above instance seems to prove that the propensities so marked in every breed of domestic dog are not found in the dingo, at all events in its natural state, although it must be confessed that, in the case of dingoes bred in captivity, better results have been obtained, as, for example, Mrs. Brooke's "Chelsworth Myall," whose photograph was given on page 160.

DINGO.

Boa-Constrictor in a striking attitude.

One of the most interesting objects in the fine collection of reptiles at the Zoo is the common Boa, which invariably affords great pleasure to the ordinary visitors, who seem to be more familiar with this snake than with any other in the collection, if one may judge by the remarks of the crowd generally gathered around its enclosure. The capacity which this class of animals possesses of requiring food only at long intervals accounts for the animal lying for weeks in a quiet and almost torpid state. But when the feeling of hunger asserts itself, they rouse themselves from their long repose, and the voracity of their appetite is then as remarkable as their previous indifference. In a

BOA-CONSTRICTOR.

state of confinement the boa takes food at intervals of a month or six weeks during the warmer months. The following account of a boa being made use of in a very curious way is worth repeating. A traveller coming from abroad brought a quantity of cigars with him in a large box. Not wanting to pay duty for these cigars, he had a false top made to his box and covered it with an old blanket, on the top of which he placed a couple of good-sized boas! On arriving at the Customs House, the keys were demanded and given up, with a warning that the box contained very dangerous snakes. The officials, being incredulous, opened the

ORNAMENTED TOAD.

lid of the box in an off-hand, careless manner. Hearing the noise of the keys and seeing daylight admitted, the snakes woke up and began to hiss, brandishing their forky tongues. This was too much for the officers, who, like many people, no doubt believed the tongue was a venomous sting, for down went the lid of the box in an instant, and the box, snakes, cigars and all were allowed to pass without further and more minute examination.

Ornamented Ceratophrys or Horned Toad of South America.

THESE brilliantly-coloured horned toads are remarkable for their fierce and carnivorous habits, which, combined with the enormous proportions of their mouths, gives them a most formidable appearance. They are very pugnacious, and fiercely "fly" at anyone attacking them, taking a firm hold, which they maintain with the tenacity of a bull-dog, accompanied by a cry very like the barking of that animal, whilst at other times they utter a peculiarly bell-like bass note. The animal whose photograph is reproduced is now unfortunately dead. When alive it was very often difficult to discover in the vivarium, it being buried under the shingle; but, on careful examination, the bright colouring on the back could be traced, and the eyes (the peculiarity and distinguishing feature of which throughout the entire genus is the horizontal position of the pupil) just seen between the small stones. This is the position taken up by these frogs, or escuerzos, when lying in wait for their prey. Anything from a frog, bird, or small mammal they will attack, although at times their victims are too large for them to swallow, their gigantic mouths no doubt misleading them as to the capacity of their stomachs and their ability to gorge.

White-winged Blackbird and White-backed Piping Crow

NOTHING is so opposite as black and white; yet we see in the specimens photographed the first colour pass abruptly into the second without going into the intermediate shades. Blackbirds, crows, and other birds of the same hue can now and then be seen in the Society's aviaries with white markings, and among the accidental varieties of the above have been seen some completely white, including even the bill and feet. Individuals have been observed whose entire plumage was of a yellowish-rose colour, with the bill and feet yellow; and some specimens have the head alone white, with three oblong black spots placed behind the eyes, the iris, the beak and the feet being yellow.

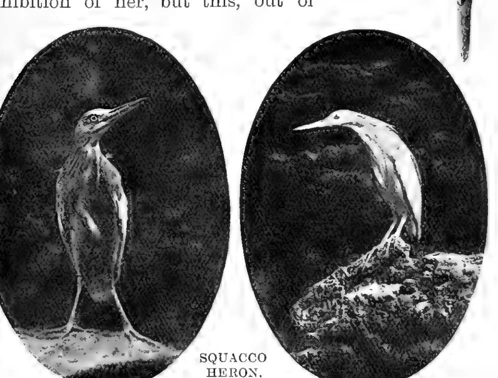
Parrots. MACAW is the popular name for any member of the South American *Aridæ*. These birds are remarkable for their size and the beauty of their plumage, the blue and yellow (see illustration) being one of the handsomest. Waterton says of it: "The flaming scarlet of his body, the lovely variety of red, yellow, blue and green in his wings, the extraordinary length of his tail, all seem to join and demand for him the title of Emperor of the Parrots." They are less docile than the true parrots, and can be rarely taught to articulate more than a few words, and their cry is harsh and disagreeable. Perhaps the most remarkable talking parrot ever known was that of Colonel O'Kelly, which died in Half Moon Street, Piccadilly, the event being recorded in all the leading newspapers. This singular bird sang a number of songs in perfect time and tune. She could express her wants articulately, and give her orders in a manner nearly approaching to rationality. Her age was not known, but she must have been well over thirty. The Colonel was repeatedly offered five hundred guineas a year for the bird's hire by persons who wished to make a public exhibition of her, but this, out of tenderness to his favourite, he constantly refused. She would not only repeat a great number of sentences, but answer questions put to her in a manner which seemed rational. When singing, she beat time with all the appearance of science, and so accurate was her judgment that if by chance she mistook a note she would revert to the bar where the mistake was made, correct herself, and, still beating regular time, go through the whole with wonderful exactness.

WHITE-BACKED PIPING CROW.

WHITE-WINGED BLACKBIRD.

MACAW.

Squacco Heron. THE Squacco Heron pourtrayed on this page was captured by a Cape Liner. The erect position of the head is that taken by the bird just before flight when surprised or alarmed; when resting, the neck is drawn in so that it appears quite short. Both these attitudes are shown in the photographs. The squacco feeds on frogs, aquatic insects, worms and small shell-fish, which it seeks only during the day.



SQUACCO HERON.

The Plumed Ground Dove.

The Plumed Ground Dove (*Geophaps plumifera*), which is a native of north Australia, is a very pretty bird and exceeding tame, considering that by nature it is a particularly wild and timid bird. Like the other Australian ground doves, it has amazing powers of flight, which enable it to cover a great expanse of ground in an incredibly short space of time.

PLUMED GROUND DOVE.

Ruff "showing off" and "in mufti."

A morning's amusement can always be had by watching the curious antics of the ruff during his courting. This little bird has a very pugnacious disposition, and the persistence with which the several of these birds in the Society's aviaries will follow each other up and show fight, until each ruff has won his reeve (as the female is called), is most entertaining. In the beginning of spring, when the birds arrive among our marshes, they are often to be seen engaged in desperate fury against each other. Even in captivity their animosity continues, and the people that fatten them up for sale are obliged to shut them up in close dark rooms, otherwise the turbulent prisoners instantly fall to fighting with each other, and never cease till each has killed its antagonist.

RUFF "SHOWING OFF."

RUFF "IN MUFTI."

I am sorry to relate that the only surviving specimen of the Galapagon Land Iguana, mentioned in my last Notes, joined the majority on December 20th. This only emphasises what I have said before, viz., that anyone hearing of a fresh arrival at the Zoo should never lose a day before seeing it, or he may be disappointed.

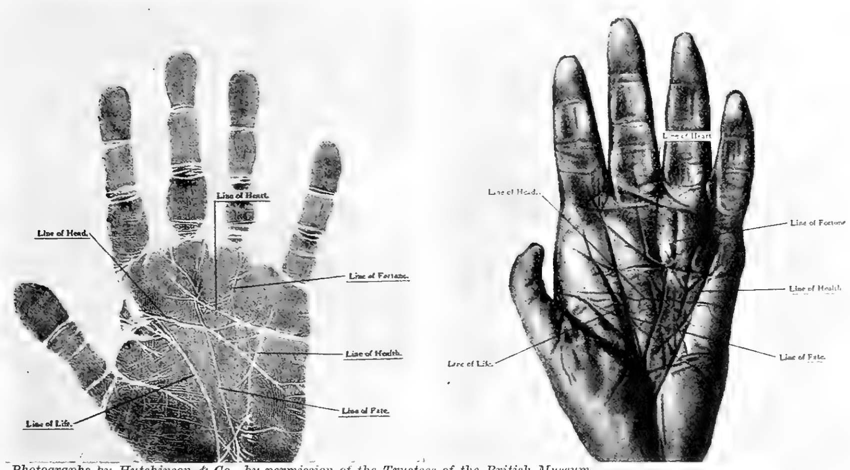
The Punctated Agouti, through a clerical error, was amusingly described as the *punctured* variety in the December number, and on the next page the Striped Hyæna was inadvertently referred to as the "Laughing" variety. It is, of course, the Spotted Hyæna that was meant.

THE PARADISE OF MONKEYS.

By R. L. Garner.

JUST below the equator on the west side of Africa is a broad sweep of delta lands covering a territory of five or six thousand square miles in extent. More than half of this area is covered with dense forest and traversed by deep winding rivers and mangrove swamps. Miles and miles of it are inaccessible to man or beast, and only creatures that fly, or creep, or travel in the tree-tops ever reach certain parts of those dreary, dismal shades. Other parts of the delta are covered with broad, grassy plains, dotted over with small lakes, clumps of shrub, dates, and low bush, crossed by narrow lagoons, and encircled by long belts and girdles of jungle. Upon these beautiful plains feed herds of buffalo and wild pigs. Along the borders of them the timid antelopes find food and shelter. In the lakes live schools of hippopotami. Through the jungle roam droves of elephants, and everywhere are birds of endless number and variety.

Over the plains and along the edges of the jungle, in the swamps and through the forest, are divers kinds of wild fruits, nuts and berries. It is a land of perpetual summer, where every moon has its harvest of fruits and its carnival of flowers. Every day brings forth a waste of food, and every hour a new crop is sown. Yet in the midst of all this abundance there are but few things that will sustain the life of man; and since nature in all her generosity has made no provision for him there, it would seem that it was not intended for him ever to occupy that strangely beautiful land. Yet in it everywhere live scores and schools of the monkey race. From place to place in the great forest, among the sylvan arches, over bridges of plaited boughs and through bowers of green, go troops and bands of these cunning little nomads of the bush swinging from vine to vine or leaping from limb to limb, rich in their possessions, and happy in their freedom. They are the real children of the wild waste of forest, and through it they play and chatter the livelong day. Every tree is their playground and everywhere their home.



Photographs by Hutchinson & Co., by permission of the Trustees of the British Museum.

IMPRESSION OF RIGHT HAND OF HUMAN BEING. PALM OF LEFT HAND OF GORILLA.

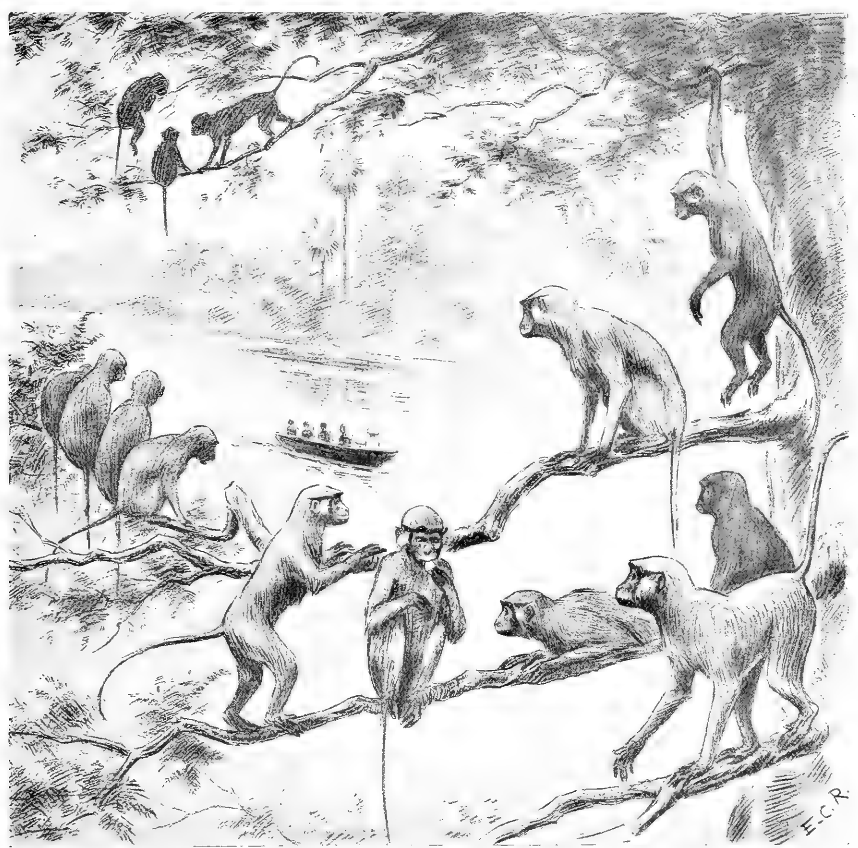
Near the village in which I recently lived for some months in Africa is a small plat of jungle, to which a large school of monkeys frequently came in search of a certain kind of the fruit that grew there. Near one of those trees is a thick cluster of bushes and vines, all twined and woven into one dense mass. Under cover of this I often concealed myself in order to watch them and study their sounds. The spot is one of rare, wild beauty, and aside from the attraction which the monkeys had for me there was a singular charm about the place that constantly allured me to it. I have often sat there alone for

"In the course of time they had but little fear of my presence."

hours. Even in the absence of the monkeys there was never a moment of the time when there was not some object of interest to occupy it. The whole jungle teems with life and action. Every nook of it is, within itself, a little world in which are fiercely fought the stern battles of life; dramas of love are played, real tragedies enacted, and at every instant some new secret is revealed to those who care to watch the myriads of strange, but real, beings that dwell within that empire of shadows and learn from them the devious ways

of nature. From this retreat I have watched the monkeys hour after hour, and in the course of time got them so that they had but little fear of my presence. In view of the friendly terms thus made I should have felt that it was criminal to betray the confidence of those free and happy creatures, and really I felt a sense of gratitude to them for the privilege of sharing the beauties and bounties of their paradise.

In passing by canoe along the rivers it is not rare to see, sitting in the crotch of a palm, or perched upon the arch of its strong leaf, a saucy little imp eating



"I saw a school of monkeys quietly looking down at us."

palm nuts. As the canoe comes near him he turns his bright eyes upon it as if to inquire the nature and purpose of the visitor. Sometimes he holds the nut aloft and utters a sound as though inviting you to join him. At other times he drops the nut and gets behind a leaf or something that will hide him, and from there watches your movements. Often you see his shaggy little head just above the leaf and his brown eyes catching everything in sight. When you have passed him,

and he feels assured that you do not mean to harm him, he springs to some point from which he can get a fair view, and begins to chatter with all the energy of an auctioneer.

One quiet afternoon I was passing along a beautiful stretch of river, admiring the gorgeous scenery and contemplating the wonders of that enchanted land. The native boys in the canoe were half asleep, and the paddles scarcely broke the surface of the water. At length my headman whispered: "Otangani ojena sinkemi sinyengi," meaning "White man, look, plenty of monkeys!" I glanced in the direction indicated, and there, perched upon the overhanging boughs, I saw a school of more than a dozen cephas monkeys quietly looking down at us. I told the boys to be still and not raise a paddle. Slowly the canoe drifted along until we came directly under the tree. I was reclining in such a posture as to see the monkeys quite as well as they could see me. Not one of them stirred, but all gazed in perfect silence at the canoe and its occupants.

When we had passed about a hundred yards below them I heard a sound uttered by one of them, which was doubtless the leader, and in an instant they disappeared. My headman then said: "Master, those monkeys know you, and we shall soon see them again."

"Know me?" I enquired in surprise, "how do they know me?"

"That is the same family that comes to the small bush near the village, and they know you because you feed them."

"How do you know they are the same ones?" I asked, for I really did not recognise them as the same.

"I have known them since I was a boy," he replied.

"But," said I, "they are not as old as you are. Monkeys don't live to be as old as men do."

"No," he replied, "but all of them don't die at the same time, and when one dies and another one is born, they go on just like people do. My great father knew some of these families, and while they are not the same monkeys they are their children and grandchildren, and they still live in the same groups as their fathers did."

This was a new idea of the social life of monkeys, and I began to ponder it. Within a few minutes he again whispered, "See! see! there they are."

Again I looked as he pointed, and there I saw the monkeys, taking their place on the boughs of a large tree two hundred yards ahead of us. Again the paddles were laid aside and we drifted down to them. When within some twenty yards I could see that they were less timid than before, and as I neared them the big leader uttered his peculiar sound of "food."

From a Sketch by the Author.

KANJO NYTIGO, OR CHIMPANZEE DANCE.

This picture represents a remarkable social carnival, and shows some of these apes beating an improvised drum, while the others "dance" round uttering long rolling sounds as if trying to sing.

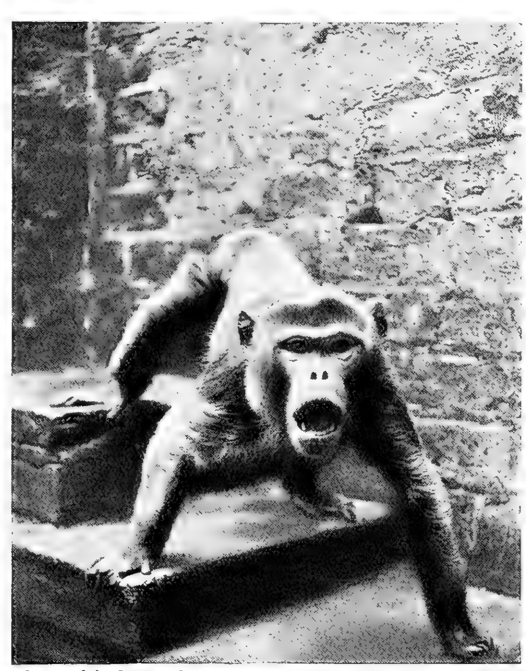
With my best efforts at imitation I answered with the same sound, and every one of them set up the cry and began to shift about as though they were preparing to climb down to the canoe.

I had no food of any kind to offer them, and I really felt guilty

of having deceived and disappointed them. But monkeys do not nurse their grievances as men do. They will forgive a friend if he is penitent and make amends in due time, while man accepts the amends and fosters the offence.

Four times I saw these monkeys before I reached the village, and on my arrival I found them in the jungle near by awaiting what they had evidently construed to mean my promise of a feast. I immediately took some bananas, and went to the usual place of meeting them, and in this manner soon repaired the breach that I had made in the friendship which I had so long laboured to establish.

Along the south side of the valley of the Ogowé River, extending from the coast to the Nguni River, there is a chain of lakes, some of them more than twenty miles long, others quite small; but all of them beautiful. Their broad surface is relieved by small islands, single, or in groups of ten or twenty each. Often they are only separated by a narrow channel, and the boughs of the trees that line their banks reach out and embrace each other. Twined among them are festoons of vines and pendants of moss reaching down to kiss the cool water, over whose calm face is spread the leaves and petals of yuccas and lilies of many sorts and sizes.



Photograph by H. Lazenby, York.

"A FIT OF TEMPER."

Quietly floating in your canoe through those silent corridors of foliage, upheld by columns of ferns and pilasters of orchids rising in all the splendor of springtime, one feels impressed with the thought that this must be the frontier of Fairyland. Art may have dreamed of such a realm, but skill has not depicted it. But here it is no dream—it is a sublime reality, in whose presence one feels impelled to bend the knee of reverence. The spots that I have tried to describe are a mere glimpse of this Paradise of Monkeys. Among such scenes those light-hearted little gypsies pass their lives in endless revelry.

Not only do the smaller kinds live here, but the gorilla, the king of apes, and the chimpanzee, his sagacious rival, the great mandril, and others of the baboon type. In no other part of the earth are found so many species of the larger kinds, nor a greater number and variety of all; nor is there any other part so rich in all the resources of food and comfort, freedom and safety for them than this great delta, where beauty and plenty leap the bounds of prodigality.

Such is the Paradise of Monkeys. It is their lawful heritage, within whose limits every monkey is a freeman and every human being an alien.

R. L. Garner.

ANIMAL ANECDOTES.

Ants' Raid on a Pie.

A cook was much annoyed to find his pastry shelves attacked by ants. By careful watching it was discovered that they came twice a day in search of food—at about seven in the morning and four in the afternoon. How were the pies to be protected against the invaders? The cook decided to make a circle round the pie with treacle and await the result. He did not have long to wait, for at 6.30 he noticed that off in the left corner of the pantry was a line of ants slowly making its way in the direction of the pies. They seemed like a vast army coming forth to attack the enemy. In front was a leader, who always kept a little ahead of his troops. They were of the sort known as the medium-sized red ant, regarded as the most intelligent of its kind. About forty ants out of five hundred stepped out and joined the leader. The general and his ants held a council, and then proceeded to examine the circle of treacle. Certain portions seemed to be assigned to the different ants, and each selected unerringly the point in the section under his charge where the stream of treacle was narrowest. Then the leader made his tour of inspection. The order to march was given, and the ants all made their way to a hole in the wall, at which the plastering was loose. Here they broke rank and began carrying pieces of plaster to the places in the treacle which had been agreed upon as narrowest. To and fro they went from the nail hole to the treacle, until at 11.20 o'clock they had thrown bridges across. Then they formed themselves in line again and marched over, and by 11.45 every ant was eating pie.

❧

How the Squirrel solved the difficulty.

At a picnic party in a grove near a glen, the following incident, which is related by an eye-witness, took place:—" A red Squirrel, with glistening, eager eyes, came creeping down a tree which stood near the table. He crept nearer and nearer, and finally leaped upon the table. The lady who was presiding said, 'Yes, help yourself to anything you want!' Upon this invitation the little fellow made bold to creep up to a loaf of bread from which only a slice or two had been cut. He seized it and dragged it to the side of the table, and somehow managed to scramble down the side with it to the ground. He then fixed his teeth in the crust, and dragged it away and down the steep sides of the glen. But when he reached the bottom and confronted the steep rise on the other side, it was too much for him. Then he gave a sort of call, which seemed to be understood, for soon squirrels were seen coming from several directions. They crowded round him, and after a little conference all took hold, and with tug and strain they managed to bring the loaf to the top of the hill, and disappeared with it in the woods beyond."

❧

An Ocean Fight.

A battle to the death between two Blackfish and a monster whale was the rare spectacle witnessed a year or two ago by passengers on the steamship "Queen." Icy Straits was the scene of the battle, during which the vessel lay to for nearly an hour to see the end. On the way down from Alaska the "Queen" had seen large schools of blackfish and whale. Crossing Icy Straits it was noticed that several of the large animals were acting peculiarly. Around the spot where a whale rose the water was boiling, stirred to a white froth. The whale sank, then rose again. Its blowing could be heard on the "Queen's" deck. A moment later a pair of sharp fins cut the water close by the whale, and two smaller clouds of vapour appeared. In a few minutes the contestants were plainly visible—a whale and two blackfish. They fought with the utmost energy. Again and again all sank, reappearing and resuming the struggle. The whale was evidently desperate. It lashed the water with its great tail until it was white for yards around. At times it rose so rapidly that the entire body showed like a huge trout jumping out of water. It tried every plan to escape its enemies, who pursued it relentlessly above and below. Finally the whale's movements grew slower. It swam weakly. Then it sank, and when it reappeared and spouted, the vapour was tinged with red. A moment later the water ceased to boil. A huge body floated quietly on the surface. Around it played two blackfish. The fight was over.

A Dog Story.

The following story of two dogs—a big one and a little one—is told by an eye-witness of the incident:—"The big dog dearly loved a fight, and for that reason he was always kept 'behind the scenes.' The little mite was of the 'discretion-the-better-part-of-valor' breed, and from puppyhood had been a devout believer in the canine maxim, 'The dog that barks and runs away lives to bark another day.' The two animals were very good friends, even though their tastes varied somewhat. In one respect the little dog was very, very human. Although he strongly objected to fighting on his own account, he thoroughly enjoyed looking on while others provided the fun, as will be shown by the following incident—an incident which I should not have believed to be possible had I not myself witnessed it. A man with a collie entered the hotel and called for refreshments. The proprietor's dog had somehow or other got in front of the bar, and as the collie was in a fighting mood, and the proprietor's dog didn't mind, a fight began. The proprietor, as usual in such circumstances, promptly stopped the fray, and tied his dog with a piece of stout string to a hook behind the bar. The diminutive dog, which had noted all the proceedings, was evidently disgusted with the abrupt and premature termination of what had promised to be a right royal canine tussle, and to the amusement of the proprietor and a crowd of men on the other side of the bar, the tiny mite began to 'worry' the string which secured his fighting comrade. He worried and gnawed, gnawed and worried, until at length he actually severed the string in two. The sullen prisoner, who had all along taken but passive interest in his chum's apparently futile endeavours, suddenly realised that he was free, and, with a yell and a bound, the released gladiator cleared the counter and went in quest of his enemy. Mere words cannot adequately pourtray the look of bitter disappointment and intense disgust on the little dog's face when the second edition of the fight, like the first, was promptly nipped in the bud by the alert and peace-loving proprietor."

"He worried and gnawed."

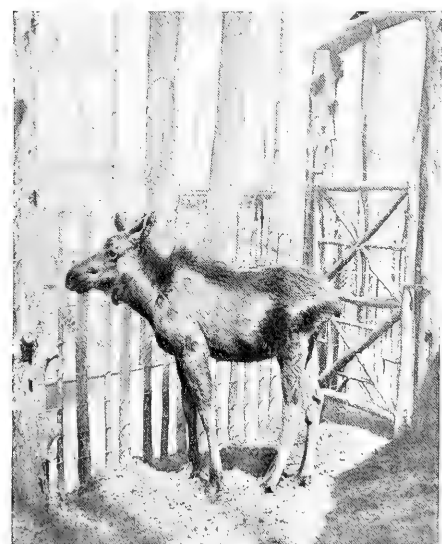
Ingenious.

A proud mother of three kittens adopted the following ingenious method of obtaining a much-needed nap, and yet being able to go to sleep feeling confident concerning the safety of her little ones. One by one she caught each kitten and took it in her mouth to the top of a large stack of wood. When all three were on the top of the stack, the mother calmly laid down at the bottom and went to sleep. The kittens walked all round the top of the pile, but dared not jump down, which, of course, the old cat was well aware of.

AN EVENING CALL IN MOOSE LAND.

By J. W. Hunt.

A day's drive from the railway, a day's walk over a seldom-trodden trail through the great woods, an hour's paddle in a birch bark canoe, and we are at home in our shack of rough spruce slabs in the heart of the New Brunswick forest, uninvited guests in the land of the mighty moose;. some with rifle, bent only on slaying; some with camera, devotees of that most fascinating of chases, the snap-shotting of wild animals; some with nothing save the sheer love of nature, asking only the privilege of looking on at the life of the creatures of the woods. It is September and the "calling season," when the ox-like moose is found in the "bogans" or backwaters where, at nightfall, they come in sociable couples to drink and nibble the tender aquatic plants. Although possessed of remarkably keen scent and acute hearing, the sight of the moose is comparatively defective, so that if they do not get the wind of the intruders they approach within a few yards of our canoe, lurking in the shadows. We take up our station an hour before sundown and, by means of a megaphone of birch bark, imitate the call of the cow moose. Beginning with a low, plaintive, whimpering note it swells to a resonant bellow as the animal, raising its head skyward, puts the full strength of its lungs into the summons to its mate. And so exactly does the expert caller reproduce this cry, so skilfully manipulate his bark horn to attain the effect of the animal's tossing head when it sends its crescendo through the night, that often, listening to the moose horn and the call of the animal itself from a neighbouring shallow, I have been unable to distinguish the real from the imitation. It is fascinating music, heard reverberating through the forest-clad hills as you sit silent, motionless, pipeless, hour after hour far into the frosty night.



Photograph by Wm. Rau, Philadelphia

A YOUNG MOOSE.

And what a rapturous thrill when it is effective! Far away up in the woods you hear an answering grunt in the far-reaching bass of the bull moose; or perhaps the resounding thwack of his huge horns against a tree as he hurries down, announces his approach. At last the splash of his huge body as he takes the water far to leeward of where he has located the call. We have, however, guarded against this characteristic precaution of the moose by drawing aside whence the scent may not be carried to the four-footed gentleman we have come to see as he splashes up wind through the shallows. For a moment he pauses, uneasy at the silence of the comrade he has come to seek; but a cautious ventriloquial effort by the caller, a peculiar whining grunt, sets him again in motion until he stands revealed in a patch of moonlight, majestic in his great size and spreading antlers, his brown coat touched to silver. Then—a trick of the wind—our presence is betrayed. With a snort of rage he beats the water with

his fore feet, and peers nearsightedly into the darkness to discover the strange intruders; but seeing nothing and still sniffing that strange smell which instinct, and too often painful experience, have taught him means danger, he tempers his martial valor with discretion, turns, and is off like a Derby winner.

On one occasion I came upon a pair in a retired bay in Nictor Lake. Whether it was because he was young and foolish, or that the lady's presence imposed an obligation

Photograph by New York Zoological Society. AN AMERICAN MOOSE.

(This specimen is a nearly full-grown female.)

for a more persistent defiance, certain it is that the bull stationed himself on a point of land and slanged me with most opprobrious bellowings for quite five minutes. Then, since I declined to come ashore and he was equally unwilling to come into deep water after me, he swaggered away shaking his head, like a bully who has just successfully carried through a bluff.

Photograph by J. Peat Millar, Beith.

YOUNG ROBINS.

NOTES AND COMMENTS.

The Robin.

THE Red-breast is a bird of sound judgment and no little common sense. He knows that the British Public is always ready to fall a prey to sentiment, and he has learnt that nothing appeals more to the English heart than a confiding nature. Therefore, when the snow falls and food is not easy to find, he takes his courage in both hands, so to speak, and boldly enters the portals of his human neighbours, demanding as plainly as possible their patronage and protection. He knows full well that the sight of a helpless little one always touches a weak spot somewhere in that big human heart. Other birds would rather starve than beg, toil and slave all day rather than accept charity, but not so the robin, who knows from experience the power of an appeal *ad misericordiam*, even if he has not learnt that it is a logical fallacy; but that little matters to him so long as the result is the same, and the same it will ever remain so long as the British Matron listens to the dictates of her heart rather than to those of her head.

An American Owl.

THE pair of young barred owls reproduced on this page is from a photograph by Dr. R. W. Shufeldt. These birds are sometimes also called hoot owls from the weird mocking laugh, *haw-haw, hoo-hoo*, which they make between twilight and midnight. Woods, waysides and sheltered farms are the barred owl's hunting grounds. Though not entirely innocent of the blood of poultry or game, its

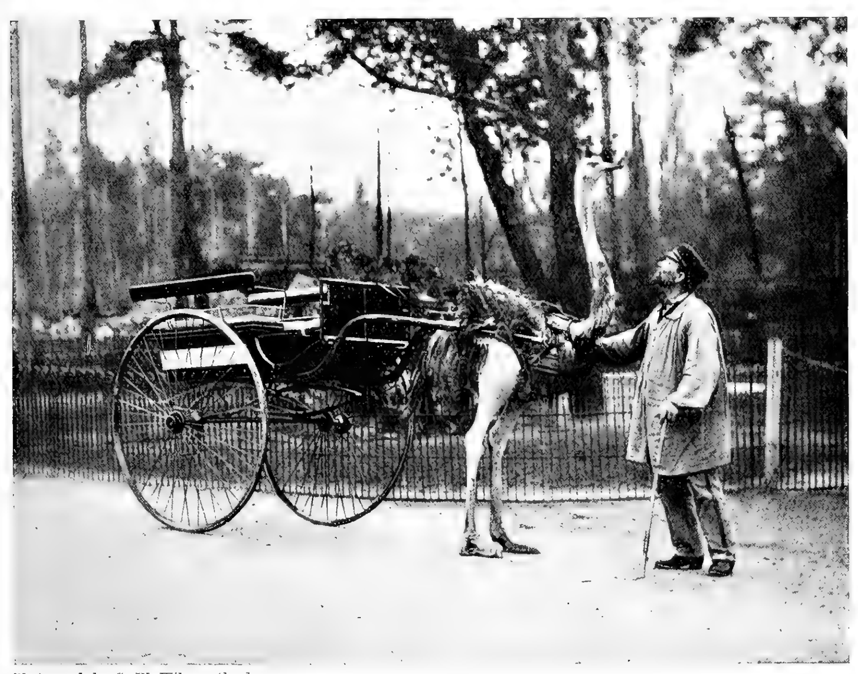
YOUNG BARRED OWLS.

(Syrnium nebulosum.)

food consists chiefly of mice and other small mammals, frogs, fish, lizards and insects, so that on the whole it is really more the farmer's friend than his foe. "In February," writes Neltje Blanchan, "the barred owl loses his unsocial, hermit-like instinct, and for his mate's society, at least, shows a devoted preference. The pair go about looking for a natural cavity in dense or swampy woods; but that failing them they unscrupulously take possession of a hawk's or crow's nest, tenaciously holding it year after year, as all owls do their homes. They rarely build a nest of their own, or take pains to line a cavity or to alter an appropriated tenement unless it should need repairs. A camera can take no more amusing picture than a group of owlets perching on a naked limb near their cradle, their downy feathers ruffled by the March wind, a surprised, comical expression on their faces, their bodies closely huddled together to save warmth."

An Ostrich Cart.

ALL sorts of queer animals have been broken to harness, but it is not often one hears of an ostrich between the shafts of a dogcart. One can imagine, however, that this bird makes a swift steed, and perhaps before long we shall see it superseding the hansom cab horse, or, who knows, the motor car.



Photograph by G. W. Wilson, Aberdeen.

A SOUTH AFRICAN OSTRICH IN HARNESS.

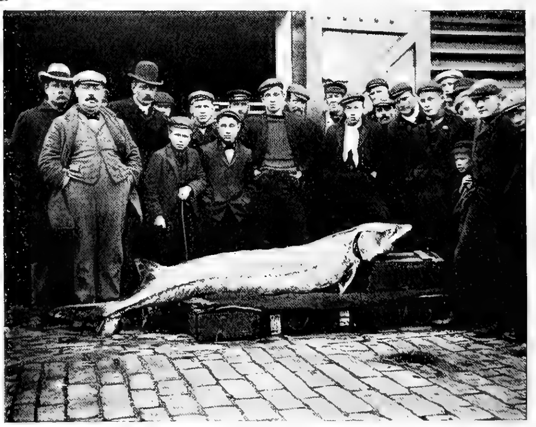
A Monster Sturgeon.

MR. LEWIS LONGFIELD, of Ramsgate, sends the two photographs reproduced on the next page of a Sturgeon caught by one of the local smacks—No. 151—and brought into Ramsgate Harbour on November 21st, 1902. It weighed 2 cwt. 3 qrs. 14 lbs., and sold for £5 15s.

The Persian Greyhound.

MR. H. C. BROOKE, who kindly sends us the photograph of "Reisch," a Persian Greyhound, writes as follows:—"One of the oldest breeds of domestic dog is undoubtedly the Greyhound, and it is to Asia that we must turn to find the greatest number of varieties of this group. Perhaps the most typical, and certainly one of the prettiest, is the Persian Greyhound, of whose appearance our picture, taken, be it noted, when the dog was not in full coat, gives a very good idea. In India the greyhound is best represented by the Rampur Hound, of which but very few pure specimens have ever been seen in this country. The Rampur is a powerful and rather heavy dog, with a Roman nose, a keen and cruel expression, large ears (as compared with those of the ordinary greyhound) and very short coat, far shorter even than that of the English dog; many, in fact, are almost hairless. This dog is game, cruel and savage. It is now unhappily very rare, having been spoilt by crossing with the greyhound. The greyhounds of Afghanistan and the surrounding countries, according to climate, vary much in coat from the Rampur, whilst much resembling him in shape and make. The dog of the Kurds is covered with a dense corded coat, which gives him a very peculiar appearance. In Persia and Arabia and Turkestan we find dogs of practically the same variety, differing chiefly in the quantity of coat they carry. They are all marked by the Roman nose, the pendant, fringed, setter-like ears and the well-feathered tail. The colour is usually a fawn of some shade. In temper all the Eastern greyhounds are rather savage and unreliable, and I have found them frequently willing to course and kill small European dogs: the same trait, I may remark, was noticed in many of the earlier imported specimens of the Barsois or Russian Wolfhounds. The Persian dog is, however, somewhat better tempered than his cousins of Afghanistan and India, but my own specimens would promptly kill any ordinary dog, and display great ferocity at the sight of my wolves; yet they are specimens which have never been used for hunting. These dogs are used in hunting all sorts of animals, including the gazelle and the wild ass, and frequently they are assisted by trained falcons. A very beautiful specimen may be seen stuffed in the Natural History Museum which in life

A Sturgeon that weighed 2 cwt. 3 qrs. 14 lbs.



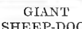
And sold for £5 15s. 0d. Caught off Ramsgate.

won many prizes for his owner, Mr. J. Whitbread. This dog was imported from Afghanistan. I only know of very few living specimens now in this country. The Hon. Florence Amhurst possesses a handsome dog; Mr. Whitbread, I believe, still owns a female which he had hoped, alas in vain! to mate with the dog above referred to; there is one in Yorkshire, and I possess a pair of imported specimens, and, as far as I know, these are the only representatives of what is undeniably a very elegant and racy-looking breed, which would well be worth the attention of the earnest breeder, as well as of those to whom a handsome and uncommon variety appeals as a companion, pet, or ornament to a country house."

PERSIAN GREYHOUND.

Two Dogs.

To Mr. Brooke we are also indebted for permission to reproduce the other two photographs on this page. One is the Owcharka or Giant Sheepdog of Russia. This is a breed almost unknown in England and, it would appear, of comparatively rare occurrence even in its native land. It is a huge dog somewhat resembling the English Bobtail in type. The one photographed was a winning dog formerly in the possession of Mr. Van Den Abeele, of Brussels. It was about the size of an average St. Bernard, but of course far more active. The last portrait on the page is of "Burggraf Erdmannsheim," a rough-haired Dachshund and a celebrated winner on the Continent; it is the property of the well-known German judge, Captain Ilgner, author of the work "Der Dachshund." In purity of ancient lineage the rough-haired variety can, doubtless, not compete with the smooth, but it is now an established variety, and breeds true to type.



GIANT SHEEP-DOG.

ROUGH-HAIRED DACHSHUND.

An Intelligent Greyhound.

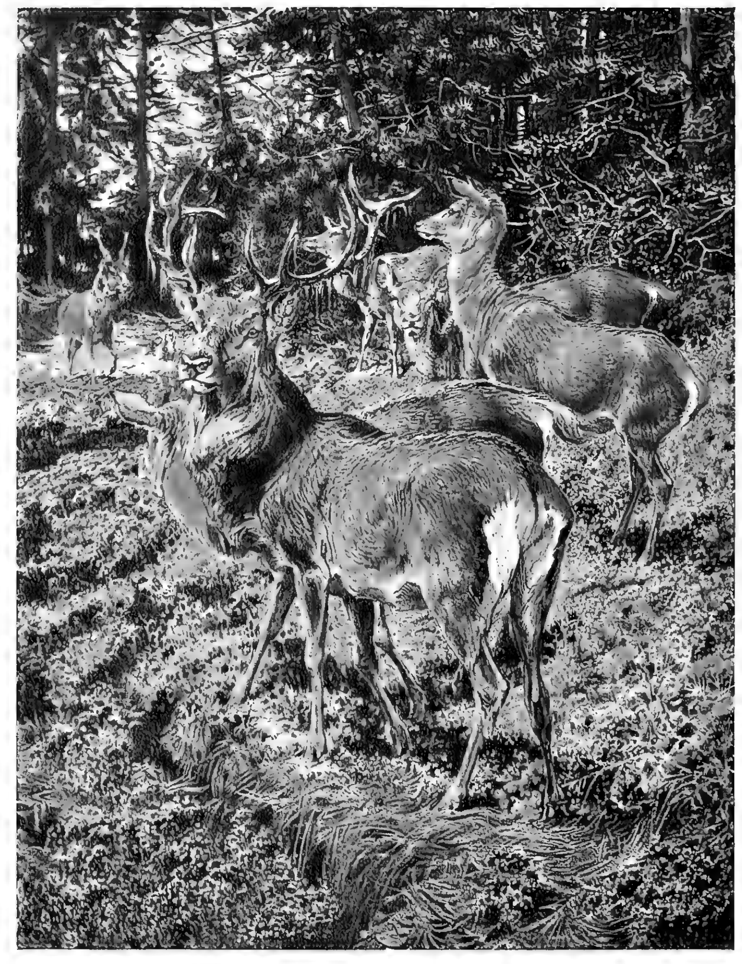
The mention of Greyhounds will appropriately admit of the insertion of the following anecdote, which has been sent to us for publication by Mr. Glynn Grylls, of Woolwich, who vouches for the truth of the story. He writes:—" 'When in India before coming home on leave,' said my informant, 'I kept a number of very good greyhounds. One of the lady-dogs presented me with a litter of ten pups in the middle of the very hottest part of the summer. To make her as comfortable as possible we took her into the house and gave her one of the bathrooms to live in. One very hot night—the hottest we had had—I woke up and heard her moving about. I got up to see what was the matter, and found that she had carried all her pups from the bathroom she occupied through the dining-room, drawing-room, two bedrooms, into my room, and had placed them under the punkah which was working there, so that they might get the benefit of the air-current produced.' "

A Cat's Dislike.

We have received the following communication from a correspondent who signs himself "Ivanovitch," and writes from London: "January 12th, 1903.—Dear Sir, I should like to bring under your notice the rather strange conduct of a cat belonging to a friend of mine. The animal in question is usually a very retiring and timid animal, even for a cat, but she has taken an unaccountable dislike to a boy who visits at my friend's house. She spits and growls at him whenever he happens to be in the same room with her, and, on at least one occasion, has attacked him, although several people were present at the time. This is the first instance I have heard of a cat behaving in this manner, and I should be pleased to learn if any of your readers know of a similar occurrence. I presume the boy must have been ill-using the animal."

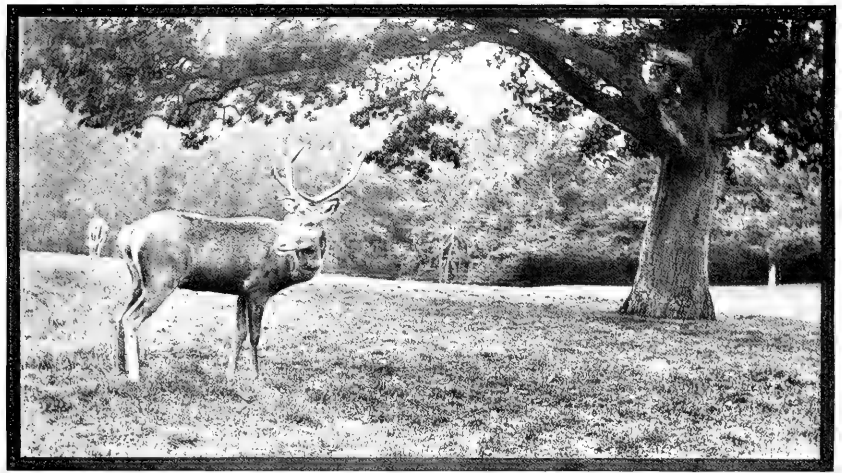
Photograph by W. Reid, Wishaw, N.B.

NEW ZEALAND.



A GROUP OF RED DEER.

From an Original Painting by SIR HARRY JOHNSTON, G.C.M.G.



Photograph by Max Mills.

A RED DEER STAG.

The light patch on the rump is an example of "recognition-marks."

SOME INSTANCES OF COLOUR-PROTECTION IN MAMMALS.

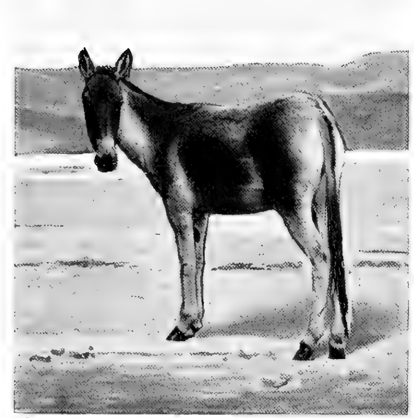
By R. Lydekker.

IN one of the side-galleries on the ground-floor of the Natural History Museum is placed a very interesting exhibit, which too often fails to attract the attention it deserves. A square box, with the front and top of glass, and lined with mottled drab cloth, contains two rough models of swimming ducks suspended on a horizontal bar running transversely through the centre. One of the ducks is covered with cloth similar to that with which the box is lined. The second is likewise covered with cloth of the same description; but the back of the model has been painted brown and the underside white. To a visitor who takes up a position a yard or two from the front of the box, the uniformly drab duck stands out most conspicuously from the background, while the one which has been painted dark above and light below is practically invisible. The reason of this difference is not far to seek. Any solid and opaque object of more or less cylindrical form, such as the body of an animal, supported horizontally in the open some distance above the ground, receives on its upper surface the light of the sky, of which it reflects a larger or smaller proportion according to the nature of its exterior. On the other hand, its under surface is thrown into deep shade. Consequently, the whole object stands out conspicuously from the background, no matter what may be the nature of the latter.

If, however, in the case of a tawny or fawn-coloured body thus supported, the upper surface be darkened and the lower side lightened, the effects of the natural light and shade are more or less completely counteracted, and the object tends to become invisible at a distance. Such artificial aids to invisibility would, however, be of but little effect in the case of a highly-polished object, of which the surface reflects a large proportion of the light falling upon it. On the other hand, a coating of coarse cloth, or still better

of hair, would break up, instead of reflecting, the light, and thus intensify the effect of the dark upper and light lower surfaces. Hence the explanation of the duck-puzzle, and hence, too, the reason for a type of colouring very prevalent among animals.

An excellent example of this type of coloration is presented among mammals by the Asiatic wild ass, or kiang, which has a chestnut-coloured coat with a narrow dark stripe running down the middle of the back, and the under-parts pure white. Probably the dark dorsal stripe does not add much to the effect, as it would be invisible to animals of the same or smaller dimensions; but the whole of the middle of the back is distinctly darker than the rest of the body. The same type of colouring is likewise presented by the gazelles, although in this group there is generally no very decidedly marked narrow dark stripe down the back. Some species, however, like the handsome Grant's gazelle of East Africa, have a broad band along the middle of the back of a darker fawn than the rest of the coat. Frequently there may also be a dark-brown longitudinal band immediately above the white of the under-parts, possibly for the purpose of intensifying the effect of the latter. In addition to the white under-parts for protective coloration, many gazelles have a large white patch on the rump which serves as a "recognition-mark" to aid the members of a herd to follow their leader when in flight. The yellow patch on the rump of the red deer is for the same purpose, as is the white under surface of the tail in the rabbit and the American white-tailed deer, in both of which animals the tail is raised when in flight so as to expose the white under surface. The under-mentioned Peking deer and its allies have also a white patch on the rump.



Photograph by W. P. Dando, F.Z.S.

ASIATIC WILD ASS, OR KIANG.

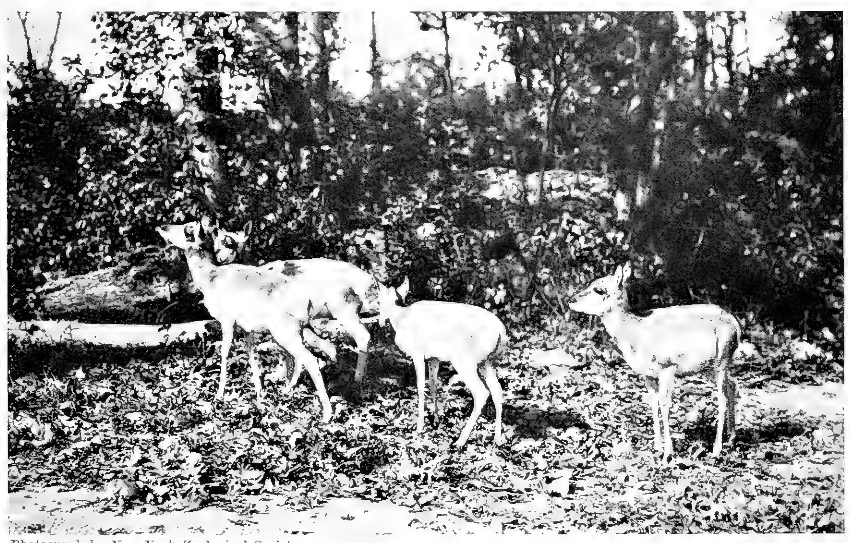
Another well-known animal displaying the above type of coloration is the prongbuck of the prairies of western North America. In this species, however, the lightening of the under-parts has been carried one step further, for there are three white gorgets on the lower surface of the neck, obviously for the purpose of counteracting the effect of the dark shade naturally belonging to this part.

This type of coloration is in the main characteristic of animals inhabiting open and frequently desert tracts, for it is obvious that only in a strong light is such a shadow thrown on the under surface as to render necessary the adoption of special means of lightening this aspect of the body. Lions, it will be noted, lack white on the under-parts; but these animals, when in pursuit of prey (at which time alone it is necessary that they should be inconspicuous), slink along with their bellies almost touching the ground. Consequently there is no dark shade cast on the under surface of the body, which need not therefore be white.

When we come to rufous or fawn-coloured animals, like the Indian swamp-deer and the smaller representatives of the African group of waterbucks, which inhabit more or less jungly country, we notice that the under surface of the body is yellowish or

dirty white, instead of pure white, owing to the fact that no very strong shade is cast on this part. The red coats of the swamp-deer and the smaller members of the waterbuck group, or kobs, as well as that of the Indian muntjac, are evidently adaptations to the perpetual verdure and bright sunshine of the tropics and subtropical zone, for we find that other deer, such as the roebuck, the American white-tail, and, to a less degree, our own red deer, which inhabit colder climates and have a rufous coat in summer, change their colour in winter to a blue or brownish-grey more in harmony with the general dull and sombre tints prevalent during the leafless season of the cooler zones.

Originally it appears that all deer, as well as all the members of certain groups of woodland antelopes, were brilliantly spotted or striped with white upon a rufous or fawn ground-colour, our reason for this statement being the fact that the young of nearly all the species are thus coloured even now, although in many cases their parents have a dress of uniform hue. Such white-spotted deer and white-striped antelopes were, it may be presumed, originally denizens of tropical jungles, where their brilliantly-marked dress harmonised with the chequered lights and shades of their natural surroundings. The Indian spotted deer or chital has retained this ancestral type of colouring, and keeps its dappled livery at all seasons of the year. Moreover, unlike some of the uniformly-coloured species referred to above, it has pure white under-parts, as well as a large white patch on the throat, indicating that it is accustomed to graze in broad daylight in the open, where the light is brilliant and the shadows are sharp and deep. The Philippine spotted deer is another example of the same type of colouring, only in this instance the ground-colour of the coat has been changed from the original rufous fawn to blackish brown. The fallow deer, on the other hand, which is a denizen of temperate climates where the leaves fall in winter, loses its spots at this season, thus clearly demonstrating that a dappled coat

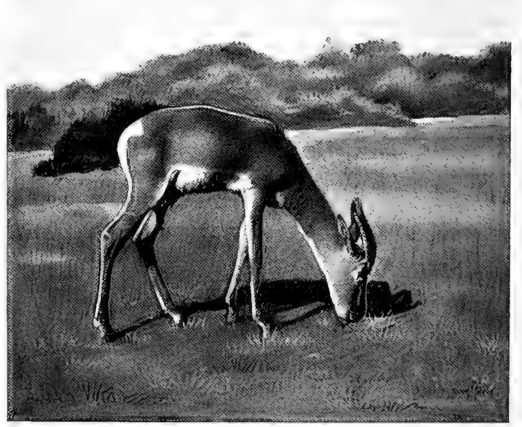


Photograph by New York Zoological Society.

A GROUP OF FEMALE AND YOUNG PRONGBUCK.

is a type of colouring correlated with leafy surroundings and the bright light of the temperate zone in summer and of the tropics at all times of the year. Those who may doubt this statement have only to watch a herd of fallow deer reposing in summer beneath some spreading oak in an English park, when they cannot fail to realize how close is the harmony between the colouring of these beautiful animals and the chequered shade of the ground on which they lie. That very distinct species the Persian fallow deer likewise changes its dappled summer livery for a uniformly fawn dress in winter. And the same is the case with the handsome Peking deer of Northern Manchuria and its smaller relative, the Japanese deer of Japan and Manchuria. Both these species are quite different from the fallow deer, and more nearly allied to the red deer. On the other hand, their representative inhabiting the tropical island of Formosa, retains its spots at all seasons.

There are other kinds of deer, such as the Indian sambar and the elk of the northern temperate and sub-arctic zones, which prefer the deepest recesses of their native forests, shunning the bright sunlight, and only venturing out in the open to graze when the shades of evening are far advanced. Such species have not only discarded the white spots of their ancestors, but have likewise changed the ancestral fawn or rufous ground-colour for a uniform coat of shaggy brown hair. How inconspicuous are such sombrely-clad animals in their native thickets, is not difficult to imagine in a certain degree, although it requires actual experience to realize fully their invisibility. That elk and sambar have taken to this secluded and semi-nocturnal mode of life for incalculable ages is demonstrated by the fact that they are some of the few deer whose young are normally unspotted. Nevertheless, we have evidence that these animals have sprung from spotted ancestors, since the young of the American elk occasionally shows faint dappling, while in the Malay representative of the sambar the fawns are distinctly spotted.



Photograph by Miss E. J. Beck.

SOEMMERRING'S GAZELLE OF SOMALILAND.
Showing light under-parts and recognition-patch.

Few animals are more brilliantly coloured than the members of that African group of antelopes which includes the kudus, bushbucks and the bongo, one of the most brilliant of all being the last named, of which a magnificent example has been recently added to the collection of the Natural History Museum. On a fawn or bright rufous ground-colour, most of these antelopes are marked with narrow white vertical stripes, as well as with white spots and a chevron on the face and a white gorget on the throat. Such colouring strikes the uninitiated as being of a most conspicuous nature, as indeed it is when the animals are removed from their natural surroundings. Nevertheless, in their native thickets—and we know from the large size of their ears, to say nothing of what we learn from the reports of sportsmen and

travellers, that most of them are forest-dwelling creatures—these animals are doubtless extremely inconspicuous, their white stripes on a rufous ground harmonizing with the vertical streaks of light and shade in an African scrub-jungle. A practical demonstration of this is afforded by the case of the elands. One of these animals inhabits the forests of the Gambia, and retains the typical rufous ground-colour with the conspicuous white stripes. On the other hand, in the striped eland of South-Central Africa, which inhabits more open country, the ground-colour has faded to pale fawn; while in its cousin of Cape Colony, which is found on the open plains, the stripes have also gone. It should be noticed that, although all the forest-haunting members of this group have a white gorget on the throat, yet none of them have white under-parts—an indication that they are not accustomed to graze by daylight in the open. In a few species of bushbuck the males have discarded the brilliant livery of their partners for a brown coat of long and shaggy hair very similar to that of the sambar among the deer. If inference from analogy be of any value, these animals ought to have taken to a nocturnal existence, and to pass the daylight hours in the most obscure recesses of the forest.

Photograph by the Duchess of Bedford.
PEKING STAG WITH THE ANTLERS IN VELVET.

Grévy's zebra, which is a forest-haunting species differing from its kindred by the narrowness of its stripes and the enormous size of its ears, apparently possesses a type of coloration adapted for concealment amid thin forest, and the same is certainly the case with the Somali giraffe, which has a colouring—a coarse white network on a liver-coloured ground—widely different from that of the ordinary giraffe. The photographs taken during Lord Delamere's expedition to East Africa, one of which is here reproduced, demonstrate the extraordinary adaptation in colour and markings of the Somali giraffe to its surroundings; it is no easy matter in the illustration, for example, to determine how many giraffes are present.

On the other hand, the ordinary giraffe, with its chocolate blotches on a buff ground, displays a type of colouring adapted to harmonize with the broken shade thrown by the tall mimosas among which these animals are found. The broad striping of the typical zebras and quaggas, conspicuous as it appears at close quarters, fades into an inconspicuous blurr on the open veldt. This type of colouring produces, indeed, comparative invisibility on a plan totally different from that obtaining in the case of dark-backed and white-bellied animals, the result in this case being to break up the outline of the body by the alternating black and white bars. A similar type obtains in the case of the tiger. It is generally stated, indeed, that the orange and black stripes of the latter animal are intended to harmonize with the tall blades of dried grass in an Indian jungle and the dark spaces between them; but it is probable that their main effect is to break up the general outline of the animal. To a large

degree this is confirmed by the circumstance that the tiger is likewise a native of the arid deserts of Mongolia and other parts of Central Asia. Nevertheless it is a fact that Indian tigers are generally more heavily striped than their Mongolian cousins, so that perhaps the former may have been further modified in relation to their present environment. The striping of the legs of the okapi, as well as those of certain species of wild goats, are other examples of this "breaking-up" type of colouring. It may be added that this type is specially adapted to deep-bodied animals, like tigers and zebras.

Another example of protective coloration is probably presented by the face of the common badger, which, as we all know, is marked by a series of black and white stripes running in a longitudinal direction. When a badger is seen in the open, these are very conspicuous; but it is probable, although I have not had the opportunity of verifying this by actual observation, that when the creature is peering out of its hole, debating whether it is safe to venture afield, these alternate dark and light stripes render it very inconspicuous. Some of my readers who may have the opportunity of watching badgers in their native haunts, will perhaps take the trouble to ascertain whether this suggestion as to the object of the peculiar face-colouring is well founded.

Photograph by Lord Delamere.

A GROUP OF GREVY'S ZEBRA.

Anyway, I have little doubt that the purpose of these stripes is to break up the outline of the muzzle.

But there is another remarkable point connected with the coloration of the badger and several of its allies, namely, that the under-parts are much darker than the back. In the badger, for instance, the back is grey, while the lower surface of the body and the limbs are black. A similar condition, but perhaps in an even more marked degree, obtains in the case of the ratel, or honey-badger, of India and Africa, and also in that of the South American tayra, which is likewise a member of the weasel family. Now all these animals are in the habit of burrowing, and the dark under-parts and light back are probably connected with this mode of life, but in what way I am not at present able to say, for such a type of colouring is by no means common to all animals which dwell in holes, as witness the rabbit. Neither is it characteristic of all the members of the weasel family which are in the habit of passing more or less of their time underground, the stoat and the weasel itself, for instance, having light under-parts.

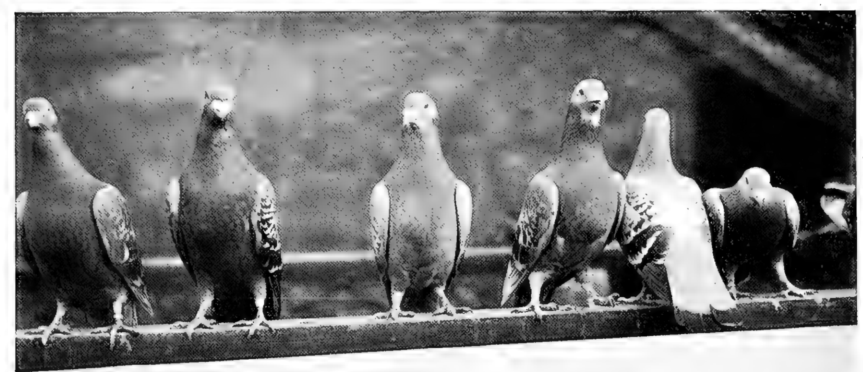
A still greater puzzle is presented by certain large herbivorous mammals—notably the wapiti and the Indian nilgai—in which the under-parts are also much darker than the back. That is to say, these creatures are coloured on a plan precisely the opposite

of the one obtaining in animals like the kiang and the gazelles, where protection is evidently the object. The nilgai is generally met with in open country or thin scrub, while the wapiti may be found either in forest or on open hillsides. Considering that other deer show protective coloration, it is scarcely likely that the wapiti is an exception; nor does it seem probable that the nilgai does not need protection by this means. In what way (if at all) such a peculiar type of coloration harmonises with the surroundings of these animals awaits explanation.

Photograph by Lord Delamere

SOMALI GIRAFFES IN COVERT.
How many are there?

The foregoing are only a few out of many striking instances of the harmony existing between the colouring and the environment of mammals. Did space permit, other difficulties connected with the subject might advantageously have been discussed. But I have already largely exceeded editorial limits, and must therefore bring my remarks to a somewhat abrupt ending.



THE WORKING HOMER

By H. KENDRICK, JR.

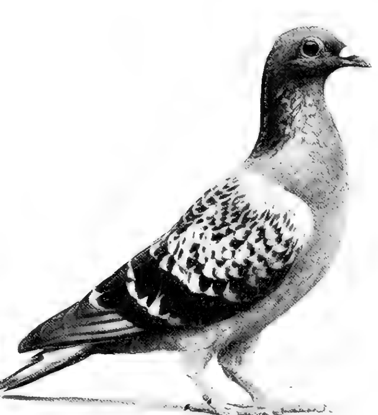
Photograph by C. Reid, Wishaw.

THE reason why a Homer, more than any other pigeon, is able to find its way back to its home from a great distance has been a vexed question for a very long time. Many pigeon men have decided to leave the matter severely alone, but others have formed theories on the point, with more or less truth in all of them, and taken in bulk we find that practically all agree that two characteristics which this bird possesses account for its homing proclivities. The two are—extraordinary instinct combined with powerful vision, the one quite necessary to, in fact almost useless without, the other. Prior to being tossed at a great distance, a homer is first of all trained for several short stages, all leading in the direction of the final goal, and it is here that its sight is so useful. It is stated, and with a good show of reason, that on a clear day and from a good height on the wing, a pigeon can see a very long distance, some say even as far as seventy miles. Supposing the pigeon were tossed fifty miles from home, it would recognise, after some preliminary circling, the surroundings of its loft, and soon get home. The next stage might be one hundred miles, and here, on being tossed and circling round, the pigeon would probably see some land mark which its instinct would reveal as being close to the spot at which it was previously liberated. On regaining this part of the country, a few more circles would show it the points of vantage round its home. Thus does the homer fly and return to its loft from sometimes incredible distances.

The next point, however, now presents itself. How are this homing instinct and keenness of vision developed? The answer is simple. They are developed by diligent training and weeding out. The working homer is a difficult pigeon to define. Although at present it is a distinct and separate variety, the question of colour, and even of breed, would not trouble an owner's mind for a minute provided only the bird could "home." This is the only qualification necessary. A good flyer is smart to look at. It has a fiery, untamed appearance; it is as "hard as nails"; that is, its feathers are close and trim, and when handled the birds feel perfectly firm. Such birds are subjected to the most stringent training and weeding out, and by these means is a loft of excellent working homers obtained.

When Paris was menaced with a siege, M. La Perre de Roo, an ornithologist, urged upon the military authorities the necessity of sending all the trained pigeons possible from the provincial towns to the capital. The authorities, as is usual, sneered, but notwithstanding that some eight hundred pigeons were brought into Paris, and they proved invaluable for transmitting news from the capital. But the news from the provinces was now the question, no pigeons having been taken out of Paris to the other towns. This difficulty was overcome by the strange device of taking out pigeons in the balloons which left the capital. There were sixty-four balloons in all, and of these sixty-three took out consignments of pigeons. Thus direct communication from inside and out was secured.

Pigeons are utilised to a great extent for more pacific purposes than the foregoing. In this and other countries they carry newspaper copy, they convey messages from a patient to his doctor, transmit instructions to and from branch business houses, furnish news cuttings to residents in out-of-the-way places, and a hundred other things. In times past they were occupied in reporting the state of the stock markets, and they are still used by pilots to report the arrival of overdue vessels, and by owners of fishing smacks on the French and Scottish coasts to bring news of the haul of fish. Messrs. Hartley and Sons, of Woolwich, use homers very extensively as carriers of newspaper copy. The message is written on "tissue" paper and tied to the bird's leg or one of the tail feathers, and it is said that one pigeon can easily carry as much MS., closely written on this thin paper, as would fill a column of the "Times." An electric bell is made to ring as soon as a pigeon arrives with a message, and thus they answer all the purposes of a private telegraph.



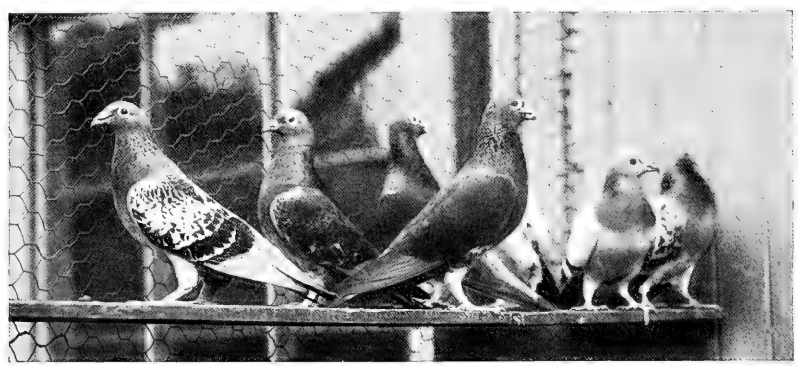
THE HOLDER OF THE LONGEST DISTANCE RECORD.

The speed of the homing pigeon is a most interesting study, and to the uninitiated appears practically impossible. In 1883 there was a grand toss at Calvi, in Corsica. The distance the 600 odd pigeons had to fly to their homes in Belgium was 649 miles, and they were tossed at 4.30 in the morning, a light wind from the west blowing. The 649 miles included, be it noted, 90 miles of the Mediterranean. The start was a grand one, the water passage being effected under excellent conditions, and the course shaped over Monaco and up through the centre of France. During the journey the wind increased in violence from the north-west, but notwithstanding this a good result was obtained. The first bird home arrived at 3.16 p.m. on the second day after toss, at Verviers. It had flown nearly 27 hours at an average speed of 607 yards per minute, or 10 yards per second. Taking into consideration the length of the fly, the speed may be taken as remarkable, though greater speeds for shorter distances are, of course, frequently obtained. On June 24th, 1888, at Perigneux, a concours organised by the fanciers of Paris, the rate of speed per minute of the first ten pigeons was 1,202 yards; and on the 30th September of the same year, in rainy weather, the fly from Lille to Paris was at the rate of 1,378 yards per minute. When you carefully study these speeds, and remember that they approximate the speeds of express trains, also considering the great amount of air-resistance and the prevalence of high

winds in wrong directions, you will see how remarkably fast is this little bird. It is, indeed, very interesting to follow the influence of the direction and force of the wind on the flight of the bird. The normal speed of a homer during calm weather, and for minor distances, is about 1,200 yards a minute; whereas, with a breeze favourable to the bird, it may attain a speed of over 1,500 yards. If the wind becomes strong and rises into a storm, blowing in the right direction, the bird's rate of speed may be 2,000 yards. On the contrary, we find that a bird flying against the wind will attain a velocity of only 900 yards, and if the wind increases, so much lower will go the average. As a rule it would be correct to say that the wind, according as its direction is favourable or the reverse, may be counted upon to the extent of one-half its speed for effect, helpful or otherwise, on the average speed of the homer.

Now for a few facts with reference to the height at which our birds fly. During fine weather, and with a south or east wind, the pigeon usually attains a height of 130 to 160 yards, and under a north or west wind 110 to 140 yards. If there is rain with a north or east wind, the bird will, of course, fly near the ground; but if rain comes with a south or west breeze, the pigeon flies high, say 160 to 190 yards, and it usually reaches the former figure in calm, clouded weather. Again, if the weather is clear and calm, the bird flies at a great height, sometimes, say, between 250 and 320 yards.

Authentic records of work done by these pigeons are numerous, but I have only space to give a few of the achievements of the magnificent pigeon whose portrait is reproduced on the preceding page. She is a dark-blue chequer hen, "Lytham Wonder" by name, and is the property of, and was bred by, Mr. D. Hedges, of Lytham, Lancashire, who, by-the-bye, is also the photographer. When one year old this pigeon flew from Bordeaux to Lytham, a distance of 622 miles, in the National Flying Club race, and it thus holds the record for the longest distance flown into England by a yearling bird. She has also flown from Bournemouth to Lytham, a distance of 409 miles.



Photograph by C. Reid, Wishaw.

HOMER PIGEONS.

ZOO NOTES.

Described and Illustrated with Photographs by W. P. Dando, F.Z.S.

Two Deaths.

Our readers will regret to hear of the death of one of the comic duettists, "Jim and Susan," the amusing pair of Chimpanzees which have delighted both young and old in the New Ape House. Poor little Susan, without any previous illness, has died from an internal displacement. In the two pictures reproduced above Susan is on the right. I hope a companion will soon be found for Jim, or else his lonely existence may cause him to follow the example of the fine male Baboon (*Cynocephalus hamadryas*), who, through sheer grief at the loss of his mate, has lately died. The female predeceased him last December, and the male, a splendid specimen, with a very prominent mantle, soon showed signs of his grief, and during the first week or so of his widowerhood was even more ferocious than when taken up with the cares of matrimony. As the weeks elapsed his savage nature gradually calmed down until he became quite docile, and settled himself down in a corner of his cage and sulked and refused to eat. It is a fatal sign with ferocious animals when their nature visibly changes to a calm and placid mood, showing, as the keeper put it, that the animal has "got the knock"; and this specimen literally laid down and died of grief. The loss is much to be regretted, as a more perfect specimen will be very difficult to find. The two photographs were the last ever taken of these baboons. It may be remembered that their portraits appeared in the first number of Animal Life. An interesting and touching chapter in the history of any zoo could be written of the broken hearts caused by the deaths of mates.

MALE AND FEMALE ARABIAN BABOONS.

"She first deceased him. | To live without her;
He for a little tried | Liked it not: so died."

—*From an epitaph on an old tombstone.*

RATEL.

Cape Ratel or Honey-Badger.

ANYONE who has visited the Small Mammal House cannot have failed to notice the "Caution" tablet, which warns the public that "These animals bite," and I have often wondered why this is the only notice-board in the Gardens with this caution. The restless nature of the two ratels at the Zoo, as seen in their never-ending walking-match round and round the cage, forming quite a track in the covering of the floor, indicates also that the pair are still savage, although the latest authorities on the Ratel say that "In confinement ratels are easily tamed." No one, however, seems to speak with any certainty about these insignificant little animals, although much has been written. Their hide is said to be so tough and loose that, if anybody catches hold of it by the back part of the neck, it is able to turn round, so to speak, in its skin and bite the offending arm. Cape Ratels are short in the limbs, the two front feet being furnished with long and powerful claws well formed for grubbing. In its native land the ratel is a strictly nocturnal animal; towards sunset it will ascend to the highest parts in search of its favourite food—honey. Raising its paws before its eyes to prevent their being dazzled by the sun, it watches and listens for the *Honey-Guide*, a little bird not exceeding a lark in size, and of plain plumage, which serves both the Hottentot and quadruped as a conductor to the bees' store.

Raccoon, or N. American 'Coon.

QUITE near to the ratel we find the Raccoons cages, where two specimens are housed—the common and the crab-eating. The former animal, which is shown in the reproduction, died during the cold weather which set in towards the end of December. At low tide the raccoons go down to the shore and open and eat oysters, which they love. They watch the oyster (which is often of great size in the locality inhabited by the North American raccoon), and when it opens they nimbly put in their paw and pluck out the fish. The crab-eating variety, which is very similar in appearance to the one photographed, but without the white markings across the forehead, goes about his angling in a very novel manner. When he intends to make a prey of the crabs, which he greatly relishes, and which are very plentiful in Carolina, he goes to a marsh, where, standing on the land, he lets his tail hang in the water. This the crab takes for a bait and fastens his claws therein, whereupon the raccoon suddenly springs forward a considerable way on the land and brings the crab along with him. As soon as the crab finds himself out of his element he lets go his hold and falls an easy prey to his sharp-witted antagonist.

RACCOON.

RED RIVER HOG.

The Prettiest and the Ugliest Swine at the Zoo.

If it is possible for a pig to be handsome, first place must be given to the Red River Hog (*Potamochœrus penicillatus*), whom I have often heard visitors call "a pretty creature." The bright red colour of this animal, with the white streak which marks the line of its back, and its long tufted ears (very much resembling those of poor "Tommy," the lynx, which died last year) make this "fancy" pig very remarkable. As a contrast to anything handsome in the swine family, its most hideous member is undoubtedly the Ethiopian Wart Hog (*Phacochœrus æthiopicus*). The circular curve of the tusks, as shown in the photographs, is not so pronounced when the animal is in the wild state and seeks its own food, as the points would be kept sharp and worn down by constant use. Captain Sir C. Harris gives a very graphic description of this particular species, as follows:—"Returning one drizzly wet morning from the banks of the Limpopo I chanced upon a very large drove of the unclean beasts feeding unconcernedly on the slope of a hill; and, the sleet obscuring my rifle sights, I projected no fewer than three bullets at the diabolical-looking boars without touching a bristle, the whole party, with a general grunt, scampering off after each discharge to a little distance, then wheeling about to show a menacing front, exalting their whip-lash tails at the same time, and screwing horrible faces at me. But the fourth missive tripped up the hoary general; and although *shooting a pig* may sound somewhat oddly in the sporting ears of my brother Nimrods, I can assure them that whilst we had no horses to spare 'the head of that ilk swine' proved a prize well worth the lead and gunpowder that had been expended upon it. Gigantic and protruding like those of an elephant, the upper tusks were sufficiently hooked to admit of the wearer hanging himself up by them to roost, as did his ancestors of yore, if the ancients are to be believed. By all who saw these trophies in the colony, they were invariably taken for the ivories of a *Zeekoe* (hippopotamus)."

ETHIOPIAN WART HOG.

ETHIOPIAN WART HOG.

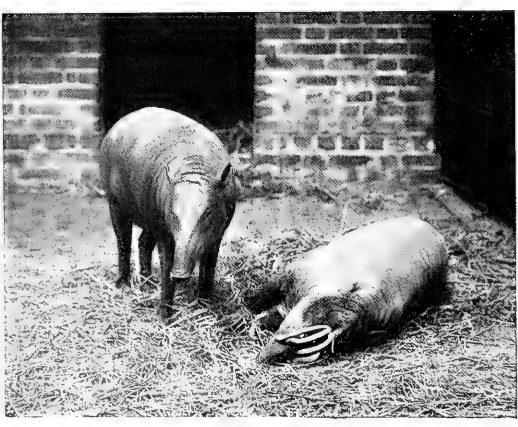
WILD SWINE.

Wild Boar. (The progenitor of our Domestic Swine.)

The Wild Boar (*Sus scrofa*) is the progenitor of all our common swine, and in the photograph shown the face will be observed to be long and the skull depressed, whereas in the domestic hog the face is shorter and the skull more elevated; otherwise, in form and general appearance, they do not materially differ. Into the merits of pork we will not enter, but it is fortunate that multitudes of people enjoy a food which is so easily obtained, for no domestic animal is so widely dispersed through the world. It thrives and lives on every kind of food, and its stomach can digest what few other animals can swallow with impunity. No animal converts a given quantity of nutritive food so soon into fat, or can be made fat on so great a variety of food. The voracity and destructive habits of the hog are too well known to require description.

Babirusa, formerly called the Stag-Hog.

These animals (*Babirusa alfurus*) are chiefly notable for their four tusks, the two strongest of which proceed from the under jaw, like those of the wild boar; the other two rise like horns on the outside of the upper jaw just above the nose, and extend in a curve over the eyes, almost touching the forehead, and fully twelve inches in length. They are of beautiful ivory, but not so hard as those of the elephant. No satisfactory explanation seems to have been given of the use of these large tusks in the male; those of the lower jaw are doubtless intended as defensive and offensive weapons, but the curved growth of these and the upper, or superior, pair prevents their proving very formidable instruments of attack, and there seems more aptness in the notion that they are employed to support the head by suspension to a bough whilst the animal is sleeping in the standing position. Even this idea is based more upon theory than observation. The form of the animal is not so heavy as in the case of the other species of the hog illustrated; it is covered with a very short wool-like hair instead of bristles, and the skin is exceedingly soft and thin.



BABIRUSA.

The Bully and his Gaolers.

The Grey Struthidea, although only about the size of a dove, is the most cruel and aggressive bird caged in the Western Aviary, and after killing many of his kind and having his quarters shifted more often than any other bird on account of his murderous propensities, he has at last found his master, and settled down to a quiet life. The only birds which seem to be a match for him are the laughing kingfishers (also natives of Australia), and they thoroughly keep him in subjection; but other birds, even double his size, he kills by piercing the skull and braining his victims.

GREY STRUTHIDEA.

Visitors to the Zoo often enquire of the keeper of the Zebra House (where the wild ass is housed) if there is a laughing jackass there, and much surprise has been expressed when they are directed to the Western Aviary and find the animal they are seeking is a biped, and no other than the Laughing Kingfisher (*Dacelo gigantea*); and one has only to ask the keeper to make these birds laugh to be surprised at the hilarity of their voice, which is exceedingly strong for so small a bird. The body is of an olive-brown, rather whitish beneath, with the tail banded with black and ferruginous, the tip being white. Gould states that these kingfishers "frequent every variety of situation, the luxuriant bushes stretching along the coast and the bushes of the higher ranges being alike favoured by its presence. Its food, which is of a mixed character, consists exclusively of animal substances—reptiles, insects, etc.; but crabs are its favourite diet."

AUSTRALIAN KINGFISHER.

General regret will be felt by everyone to hear that Mr. Clarence Bartlett has resigned his position of Superintendent of the Gardens through ill-health. It was Mr. Bartlett who accompanied His Majesty the King, when Prince of Wales, all through the Indian tour, and had charge of all the animals the Prince collected, which were safely brought over to England and exhibited at the Zoo in 1876. This exhibition of Indian animals raised the number of admissions to the Gardens to 915,764, and the total receipts for the year were £34,955, the greatest amount ever taken at the Gardens in one year. Mr. Bartlett will be greatly missed by all the employés of the Society, to whom he was most kind and just. He retires on a pension.

W. P. Dando

THE WOMBAT.

By Cyril Grant Lane.

ONE of the most interesting marsupials which lives among the dark gullies of Victorian forests is the tough-skinned Wombat, and it is surprising that an animal so numerous in many parts is so little known. Recently, while visiting the British Isles, I frequently made reference to such marsupials as are commonly to be seen in these vast forests of eucalyptus, and with but few exceptions realised that the word "wombat" conveyed little or no meaning to those with whom I conversed. It is true also that even here, surrounded by the rolling forest ranges—the solitary home of the animal—few people, apart of course from the bushman who eats, works, drinks and almost lives in the saddle, have actually seen this creature, or can describe its appearance with accuracy. This apparent want of interest in the inhabitants of the wilder bush is to some extent excusable, inasmuch as the wombat is accustomed to move at leisure among the thickest beds of bracken fern which carpet the lower slopes of the ranges, where few sounds—save the thumping of the wallaby, as it tracks along the sidelings, or the thundering crash of falling timber—ever break the great stillness so characteristic a feature in the far-reaching eucalyptus forests. Therefore it will be understood that, in order to approach the animal with a view to studying its general life, one must be imbued with a true hunting spirit, and more than ordinary patience as well.

The wombat seen in the illustration is one of the finest in size and coat which ever fell to my rifle, the carcase weighing upwards of 50 lbs The darker portion of the

picture on the left is the cavernous entrance to the animal's burrow, usually an excavation from twenty to thirty feet in length, and sufficiently capacious, at least for the first few yards, to permit of a man's intrusion upon hands and knees.

It will no doubt be remembered that McIntyre, of the Victorian mounted police—a man with whom I am well acquainted—sought and found refuge in a wombat's burrow when hard pressed by the notorious Kelly gang, remaining therein throughout the night. McIntyre is a fine, squarely-built man even now, despite his advanced years, standing over six feet in his stockings, a fact which suggests the dimensions of the burrow. It is noticeable, however, that where the ground is rocky or unusually hard, the burrows are very much smaller, in many cases barely admitting the rightful owner.

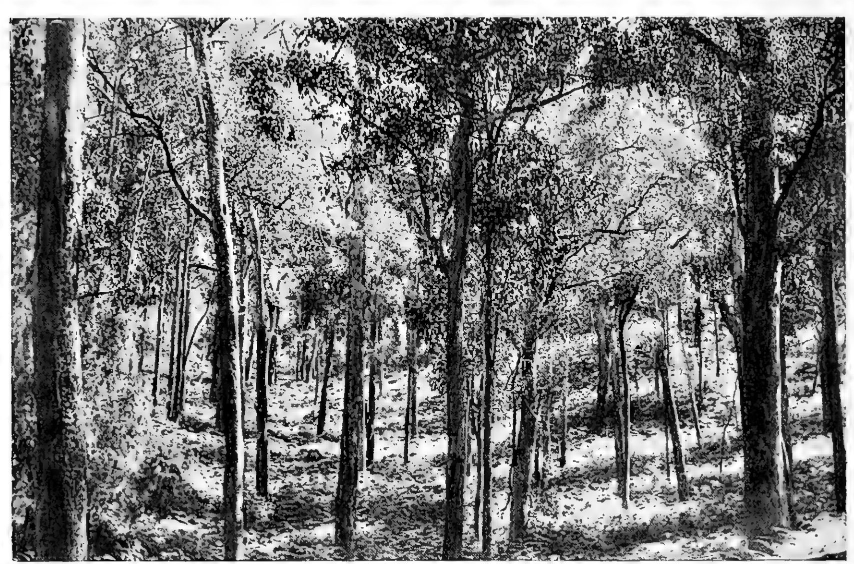
The wombat is a sociable creature, often digging its burrow within a few yards of its neighbour's dwelling, having tracks common to the use of all leading to various gullies, spurs, favourite hollow logs, or water-holes, and not infrequently resorting to the same locality, there to sink shafts and drive tunnels until a wombat warren is formed. I remember, in one gully, counting no less than fourteen of these animals, and thirty-three burrows—great tunnels driven horizontally into deep chocolate soil, well-beaten tracks radiating from them in all directions, partially hidden by the tangled growth of bracken, fern, and creepers. The wombat, when engaged in battle, makes good use of its head as a battering-ram, furiously butting at its opponent; neither is it forgetful to occasionally prove the sharpness of its teeth. Broad, somewhat flat, and solid to a degree, the animal's head is admirably adapted for such warfare. Correctly speaking, the wombat is of nocturnal habit, and may be heard perambulating the gloom-enwrapped forest depths, giving voice at intervals to a deep guttural growl; nevertheless, I have often disturbed them in broad daylight basking in the sunshine, comfortably ensconced between the wide-spreading roots of some gigantic mesmate, or stretched out beside their respective burrows, as seen in the illustration. The animal, being of course a marsupial, carries its young in a pouch, after the manner of the tiger-cat, opossum, and flying squirrel, and most valiantly does it guard the little creature against the attacks of domestic dogs, its kick, delivered with a short hind-leg, being very powerful; in fact, a single blow has been known to break a dog's leg. If alarmed while some distance from its burrow, the animal makes little attempt to investigate the cause, but

ENTRANCE TO A WOMBAT BURROW.

hurries along, half running, half cantering, halting not till within a few feet of its cavernous home, where it stands and listens—not *looks*—for the fancied or real danger, those short ears never failing to catch the slightest sound, and invariably suggesting the bowels of the earth as the only safe retreat.

The picture awakens within me reminiscences of a somewhat ludicrous nature, and at the same time serves to acquaint the reader with the relative size of an average wombat. While camped 'way up the Big River, behind Mount Torbrek, we ran short of "tucker," the bushman's name for food, and having twelve miles to travel across ranges, as rough as they are steep, in order to procure a fresh supply, we decided to replenish our larder—a loose canvas bag strung up in the deep shade of a silver wattle—with the hind-quarters of a wombat, and so postpone our monthly visit to the store till a later date.

On previous occasions, bent on a similar errand, we had visited a certain gully



THE HAUNT OF THE WOMBAT.

branching off a rapid mountain creek, which was hemmed in by belts of dog-wood scrub and flowering lightwoods, and bore the title of "Wild Dog Creek," and it was from this gully that we were, I believe without exception, fortunate in returning to camp with at least a wombat, and sometimes a wallaby as well. Thus, encouraged by success in the past, we again sought the same locality and once more were favoured by fortune, for my dog—a smooth-haired collie—very soon struck the scent of a wombat, followed, and worried the animal with such persistence that it at length took refuge in the gigantic hollow of a fallen mesmate tree, levelled by the violence of storm and tempest or the effect of old age and decaying roots. This position proved so invincible, that the dog's most strenuous attempts to dislodge the wombat were quite unavailing. Determined to possess ourselves of game so nearly within our reach, we set to work in the following manner: Striking a match and holding it as far into the

WOMBAT'S HOLE

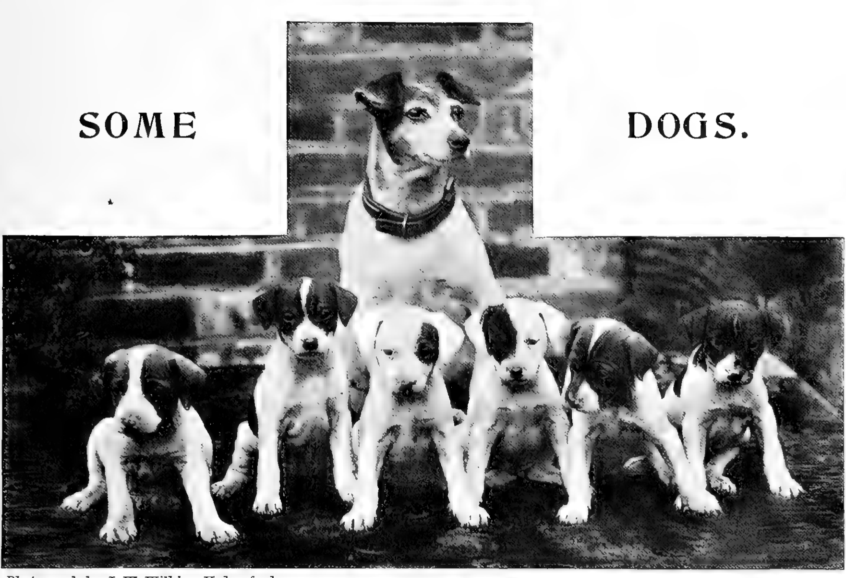
THE TROPHY.

hollow as possible, I called off the dog, who was inside vainly attempting to grip the animal's rotund and tailless body, and, with the aid of what faint light was emitted by the flickering match, fired at the growling wombat with telling effect. The deafening noise of the explosion, confined within so limited a space, suggested most forcibly the advisability of firing for the future into *limitless* space. At this stage in the proceedings difficulties seemed to look almost insurmountable, for, though undoubtedly we had been successful in shooting a wombat, the animal had most effectually imprisoned itself in a place undeniably awkward to get at, and in that position had died. The dog's best efforts to drag out the heavy carcase merely wasted his strength and energy, which conclusion he at length arrived at, for he backed slowly out of the log, coughing and spluttering with a mouthful of hair, and flung his dusty body down among the cool ferns, where he whined in disgust at his own incapacity. My companion—figure on the left—suddenly suggested that he should attempt to venture up the log himself, and strive to reach the animal in that way. 'Twas a lucky thought, and but a few moments elapsed before a pair of heels were kicking aimlessly at the entrance of the hollow, after which a rumbling and scraping sound alone suggested the presence of a human occupant within the log, for my companion had totally disappeared from view, and was inhaling dust from dry, decaying wood and fumes of imprisoned gunpowder. His shouting soon attracted my attention, and upon thrusting my head and shoulders into the hollow I learnt from various incoherent remarks and "sunny" interjections that he was gripping the wombat by the hind leg, but recognised the feat of working his way backwards out of the log, hampered by the weight—no small encumbrance—of the carcase, as absolutely impossible; indeed, it was but a moment later that I received information in the same husky manner to the effect that, even if the wombat were abandoned, he could not work backwards in so small a hollow. The tone of the voice which uttered the words, "*Do something quickly; I'm suffocating here,*" can better far be imagined than written in words with pen and ink! Struggling up the hollow until within reach of his feet, I tugged and pulled with might and main, eventually succeeding in dragging forth two trophies—man and beast! It seems that the splintered walls of the hollow at the smaller end were the principal cause of trouble, since they caught and held my companion's clothing so firmly that, in so cramped a position, he could not liberate himself.

WOMBAT DIGGING IN THE SNOW.

Within a short distance of the summit of Mount Torbrek (nearly 5,000 feet above sea level) I shot a remarkably fine wombat, long in the hairy coat, and beautifully glossy, the locality being for some months during winter partially covered with snow; from this fact one may, I think, conclude that these animals are blessed with hardy constitutions. As seen in the accompanying illustration, a wombat was in the act of digging in the snow in search of roots when I photographed it. Only infinite caution and great patience enabled me to approach so close to the animal without disturbing it.

SOME DOGS.



Photograph by J. W. Wilkins, Hednesford.

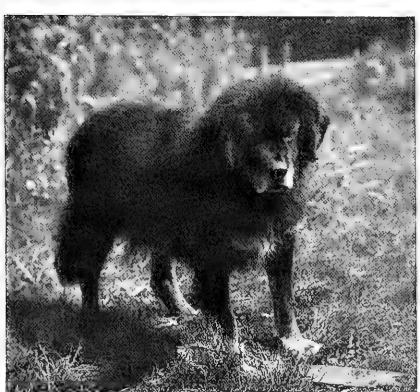
The Mastiff.

In addition to the headpiece which adorns this page, we give portraits of three dogs, each of whom can lay claim to some distinction. For the portraits and information concerning the English and Tibetan Mastiffs we are indebted to Mr. H. C. Brooke, who writes:—"Although the Bulldog is commonly called the national breed of this country, there is really not the slightest doubt that this title should really with far more right be borne by the Mastiff, which is a breed of far greater antiquity, and which no doubt was originally derived from the mastiff by a process of selection of specimens more suitable for the sport of bull-baiting. The mastiff we find referred to by old writers long before any mention is made of the bulldog; and even at the commencement, when we do find bull-dogs mentioned, there is no doubt that those animals were not bulldogs as we to-day understand the term, but simply dogs of any variety, but usually mastiffs, used for baiting the bull: similarly we find frequent references to bear-dogs, but on this account no one has yet claimed that the old English bear-dog was a special variety. A very little reflection will show that very different stamps of animals might be found suitable for combat with two such diverse adversaries as bull and bear: and whilst at first, according to the fancies of their respective owners, one pup out of a litter might become a bear-dog and the other a bulldog, that would not prevent them both from being mastiffs, from which breed, no doubt, in turn, by selection of small and undershot specimens, the real bulldog would be evolved. It is a matter for wonder and regret that such a noble, majestic, and ancient breed as the mastiff should have been allowed to dwindle away numerically in its native land as is now the case, when those fanciers who really do anything in the breed may be counted on the fingers. Why the often evil-tempered St. Bernard, with the additional drawback common to all long-haired dogs of requiring more attention, should be preferred to him is a riddle, and one might well have expected that when the Kennel Club promulgated its edict against the cropping of dogs' ears, many fanciers of big breeds would have left the Great Dane, who thereby was

deprived of all his smart and noble appearance and made to look common and ignoble, and taken up this fine breed. Amongst those gentlemen who help to keep up the mastiff are Mr. Luke Crabtree, of Manchester, the past, and Mr. R. Leadbetter, of Hazlemere Park, Bucks, the present owner of the noble specimen 'Hollands Black Boy,' whose portrait is given, and who, being one of the greatest winners, may be taken as a thoroughly typical specimen of this noble variety.

Tibetan Mastiff.

"ONE of the most ancient breeds of domestic dogs is the Tibetan Mastiff, which, centuries ago, attracted the attention of travellers by its size and ferocity. Unhappily, it is but seldom that really large specimens of this variety are seen outside of their native country, and even then, as in most breeds, the inferior examples are the most common. Many long residents in India have never seen this dog at all, others have only seen second and third rate specimens, and a really fine example has never been seen alive in England. The largest individual I ever saw alive measured 32 inches at the shoulders, and was a most noble-looking animal. These dogs, sullen and savage by nature, are of inestimable value to the Tibetans, who use them to guard their villages when the men are away on trading excursions, to watch the herds of sheep and yaks, and to drive off four-footed and two-footed marauders. A couple are frequently reckoned a match for a leopard. Important points in the breed are the bushy tail, the heavy mane, the wrinkled face, deep-set eyes, and the high skull, which is "peaked" at the occiput somewhat like that of the Bloodhound. Of late, an attempt has been made in irresponsible quarters to alter the name of the breed to Tibet Sheepdog; but as the breed has been known for years as the mastiff (also in France and Germany), and his appearance (bar the long coat) more resembles the mastiff type, there seems absolutely no reason to alter the name of this ancient breed at the bidding of one or two who, as shown by their own writings, have never even seen a first-class specimen of the variety.



Photograph by Hutchinson & Co.
TIBETAN MASTIFF.

Photograph by C. Reid, Wishaw.
ENGLISH MASTIFF.

"The subject of the illustration, 'Dsamu,' is the property of Mrs. H. C. Brooke, and bears a striking resemblance to 'Siring,' the excellent specimen brought back by His Majesty, when Prince of Wales, on his return from India in the seventies. 'Dsamu' has won many first prizes at shows; he is now nearly fourteen years old (these dogs are said not to live long as a rule in warm or temperate climates after being used to the

eternal snows of the Himalayas), and is the only specimen in England.

"As the existing quarantine rules make it doubtful when another will be imported, it is more than probable that 'Dsamu' will maintain his 'splendid isolation' until his dying day. He presents a striking instance of the power of the migratory instinct in animals. Although he has been in England for several years (six, at least), he always gets very restless about the end of September or beginning of October, and this condition lasts for some four weeks, during which time he eats but little, runs to and fro groaning like a bear with a sore ear, and unless carefully watched will tear down the fences and wander off, though all the rest of the year the very slightest fence is sufficient to confine him. This tendency on his part, being mentioned in the now defunct journal 'The Exhibitor,' elicited the following reply from a writer who conceals his identity under the name of Kinchinjunga, but who we happen to know is one whose opinions are valuable:—'His kith and kind are, and have been for generations, migratory dogs, going up-range in the Himalayas in May to avoid the heat of the hot weather and the wet of the monsoon, and coming down-range in October and November to get clear of the snowfall. It is exceedingly interesting to see the animal retain these artificial accomplishments of a nomadic life in civilised life in England, where there is only a nominal hot weather and no monsoon.' These remarks, I assume, would apply more to those dogs which live in the Himalayas and on the borders of Tibet than to those living in Tibet proper; and it is a fact that 'Dsamu' was imported from the Himalayas."

What is it?

CONCERNING the other two photographs on this page, Miss Ethel Woissam, the owner of the dog, writes:—"I enclose two photographs of a dog that has been in our possession for two or three years. It is said to be a Siberian Sledge Dog, but it does not correspond exactly with the photograph in your number for September, 1902, but is more like the White Wolf in December, 1902. He is about the size of a small collie, and is of a biscuit-colour. He also digs holes as do the Esquimaux dogs. He is no good as a house-dog, for he only barks when he is pleased. He feels the heat very much in summer, and even in winter it is difficult to get a photograph of him without his tongue out."

Mr. H. C. Brooke, to whom the photographs were shown, says:—"So far as can

be judged from the photograph, the dog may be a 'Siberian sledge dog,' but of no merit; probably a badly-bred one. It might be a badly-bred Arctic dog of any variety. I should not be surprised—judging merely from the photographs, which of course is hard to do—if the dog had a little wolf blood in him. His coat is not like that of a good Samoyede or Esquimaux."

For the photograph on page 309 we are indebted to Mrs. J. H. Mitchell, of Great Haywood, who is the owner of the happy family depicted.

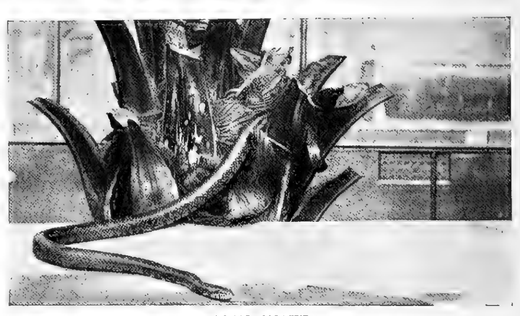
UNCOMMON PETS.

A series of articles on the Care and Keep of Animals in Captivity.

By P. WELLINGTON FARMBOROUGH, F.Z.S., F.E.S., etc.

IV. SNAKES.

SNAKES are usually looked upon with some signs of abhorrence, and many people, even those who have never troubled to find out whether they were correct or not, describe them as "nasty, slimy creatures." Well, speaking generally, snakes are not nasty, and are certainly not slimy—or even wet, unless they have just emerged from water. Once the natural timidity of a person is overcome, and he or she is persuaded to handle one of these reptiles, they are greatly surprised to find that snakes are not so unpleasant to touch as they had imagined, and that, contrary to their preconceived opinion, they are warm and dry, resembling nothing else so much as a piece of well-printed oilcloth. As may readily be supposed, snakes cannot be handled indiscriminately. Some do not bite; the majority do, and many of the latter are poisonous. In this article all the snakes mentioned as being suitable pets are harmless; that is, they are non-poisonous, and if they bite do not inflict any wound of at all a serious nature. If due care is taken, there is no need for the person who "takes up" snakes to be bitten at all. The writer has handled many hundreds in his time, poisonous and harmless varieties, and has never yet been bitten by any, although at the same time he has had many narrow escapes, the nearest being when a constrictor got round his neck and began to squeeze; luckily, some one experienced in the handling of large snakes was close at hand and able to uncoil the reptile, not, however, before the writer was getting black in the face. Snakes are of various sizes, some being but a few inches in length and others more than twenty feet; some cost a few pence, others several times as many pounds. Small snakes are sold at so much each, the large kinds, such as pythons, by the foot; the larger the snake the greater the price per foot; *e.g.*, a Malay python (*Python reticulatus*) nine feet long costs eighty marks—that is, about £4; another, fifteen feet long, is priced at 500 marks; one twenty feet long costs 1,000 marks, and one a little longer still (twenty-three feet) is valued at 1,500 marks. These prices are taken from Hagenbeck's latest catalogue.



CORN SNAKE.

Large snakes like these are only for the experienced reptile keeper; and as one must learn to crawl before beginning to walk, so must an amateur "snake-charmer" begin his experience with the smaller species, such as the Four-rayed snake, the Æsculapian snake, or the Chicken snake or others of kinds allied, and thus, fortified with the experience of these, one may extend ambition to the larger kinds like the Boas and their kindred, or even, as the writer, to the keeping of the dangerous sorts such as Rattlesnakes and Cobras.

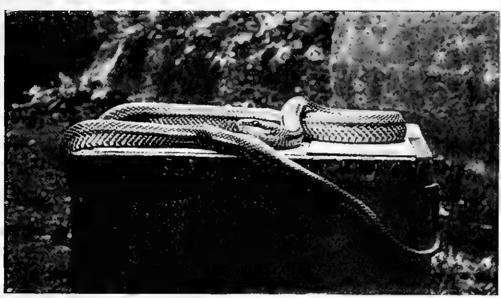
A case for snakes is usually a very simple affair, and may conveniently be about four feet in length by a couple of feet high and eighteen inches broad. The floor

and two ends may be of wood, the two sides of glass—preferably plate—and the roof of perforated zinc set in a hinged frame to permit of the interior being cleaned out, food put in, and the inmate attended to generally.

Pea-gravel is the most generally useful covering for the floor, although fine well-washed sea sand is better for skinks (a kind of lizard) and sand snakes; for certain snakes a half-and-half mixture of silver (or sea) sand and earth is recommended. All reptiles drink, and therefore water must be provided in a suitable receptacle; a small bough of a sapling placed diagonally from a lower corner to an opposite upper one affords opportunities for climbing. A bit of virgin cork placed on the floor serves as a hiding place to which the reptile may retire whenever it desires to shun observation.

Some snakes will only be kept to advantage when their cases are artificially warmed to a temperature of 80° or so. To keep this temperature equable may be to some people too troublesome, and therefore in this article those snakes requiring artificial heat will be passed over; among these are the Boas, the Hoary snake, the Lacertine snake, and the Whip snakes. Omitting mention of the Grass snake and the King snake, the most suitable snakes for beginners in reptile keeping are the Æsculapian snake, the Chicken snake, the Corn snake, and the Four-rayed snake.

The Æsculapian snake (*Coluber longissimus*) is a pretty little snake, about a yard in length; it is of an olivaceous tint, sometimes verging into a grey green, the edges of the scales being often tinted with white. The under side, which in all snakes is lighter than and usually different in colour from the upper parts, is of a yellowish hue. This species is usually very quiet and well behaved, but the writer has often had examples that were in appearance, but only in appearance, dangerous, for the jaws are hardly strong enough to cause the teeth to pierce the skin. It is not an expensive reptile, 7s. 6d. being a usual price, although 10s. may be asked by some dealers. It may be fed on mice or lizards; birds, such as sparrows, etc., are less readily taken.



FOUR-RAYED SNAKE.

The Chicken snake (*Coluber obsoletus*) can be strongly recommended. It is hardy, easily provided for, and quickly gets tame. An average-sized specimen can be purchased at from fifteen to thirty shillings. It is fed principally on eggs, but small birds or rats may be occasionally offered either in addition to, or in place of, the usual diet.

The Corn snake (*Coluber guttatus*) in captivity is very sluggish during the daytime, remaining secluded from observation under its blanket until the evening, when it becomes extremely lively in its movements. Rats and mice form the chief diet.

The Four-rayed snake (*Coluber quatuor-lineatus*) is fairly common in southern Europe, and attains the length of more than six feet, so that it is quite the largest of this continent's snakes. It gets tame in a remarkably short space of time, and is a universal favourite with those who go in for snake-keeping. The price is not very formidable, and about a sovereign will buy a very fair specimen. Gentle and confident, it forms an interesting and pretty pet for ladies, and is no trouble whatever to look after. Mice, small rats and birds, and eggs will form the principal articles of diet, and on these the Four-rayed snake manages to exist for a good number of years in captivity.

ANIMAL ANECDOTES.

A Queer Ferry.

An old Texas negro owns a ferry-boat which used to have a horse and a mule to work the paddles. One day both these animals came to an untimely end, and the poor ferryman thought that his career was at an end. But one night soon afterwards he thought he heard the familiar sound of the paddle-wheels turning, so he went to look, and there, sure enough, was one wheel of the boat churning the water into foam and making the boat strain at its moorings. Cautiously he looked over the side to ascertain the cause, and there, to his astonishment, saw a large alligator which had fallen into the stall formerly occupied by the horse, and in its attempts to run away was turning the wheel! That gave the negro an idea, and for some days afterwards that unfortunate alligator was employed to propel the boat. But this meant, of course, that the boat had to work on one wheel, so another alligator was captured and placed in the vacant stall, and soon the boat was plying to and fro as in the old days. The novelty attracted great attention. The boat is now a familiar sight on the river, with its two industrious alligators paddling away vigorously.

Towed by a Buffalo.

Another animal used in a similar way is the water-buffalo. When their river is flooded the natives of Mindanao, in the Philippine Islands, "drive" across. These animals are equally at home on land or in water, a peculiarity of which the ingenious natives are not slow to take advantage.

Ravens versus Falcon.

Lord Lilford, amongst the collection of live animals which he kept, had two pet ravens, "Sankey" and "Grip" by name. "Sankey" unfortunately went blind and died a few years afterwards, but "Grip," if not so familiar and so sociable, was quite as amusing as the "late lamented," whose name he constantly repeated, and apparently took to himself. After "Sankey's" death, "Grip" had, as a mate, another raven, from Spain, whom he rapidly instructed in every sort of mischief and "devilment." "One afternoon," says their owner, in "Lord Lilford on Birds," an ornithological book edited by Mr. Trevor-Battye, "I heard these ravens making a very unusual clamour close in front of the house, and, on looking out of the window, perceived that they had got hold of and nearly killed a peregrine falcon; I sent out a servant, who secured the falcon without difficulty. We found that it was an old wild bird suffering from a sort of asthma known to falconers as the 'croaks,' and somewhat poor in flesh. I would willingly have tried to keep this falcon alive and restored it to liberty, but the ravens had injured it so severely that it was only common mercy to kill it. How or why it allowed itself to be seized and worried by its antagonists we can never know."

The Crow's Cunning.

"I was driving in my victoria along the sea-front of a big town," writes an Anglo-Indian, "and about a hundred yards in front a coolie was running on the road, carrying upon his head a basket of small fish about the size of a herring. On these half-a-dozen crows were making a sumptuous banquet without the robbed man being aware of his misfortune. I watched the tactics of the depredators. Had the crows rudely swooped down on the basket, the attention of the victim would have been at once attracted. But, one at a time, the wily birds advanced on noiseless wings, lighted on the road-way just at the man's heels, and then by a single gentle hop were enabled to spring aloft and pull out a fish by the tail without so much as touching or giving the slightest jog to the basket. In this way I saw a score of fish abstracted before I deemed it time at last to shout out to the unconscious Hindu. The man's expression of face when he looked first at his half-emptied basket, and then at the line of thievish crows devouring the plunder at intervals along the road, was not to be forgotten."

Ditto.

The following story also illustrates the cunning, or perhaps intelligence, of the crow, this time an English one. A dog was once enjoying a bone, when two crows made an attempt to rob him of it. The dog showed his teeth: the birds retired. In a short time one

of them flew down and gave the dog a peck at the end of his tail. Only one result could follow such a movement. The dog turned sharply round to see who was taking such a liberty with him, and the other crow at once pounced on the bone and bore it away.

The Audacity of Monkeys.

In "A Sportswoman in India" Miss Savory writes entertainingly of the monkeys in the foot-hills of the Himalayas. "For cool impudence and audacity," she says, "these hill-monkeys stand unrivalled; they slip into the bungalows and carry off anything from the table if the room is empty. They spring from tree to tree, from house to house—a mother, it may be, with two young ones clinging to her, a loaf of bread in one hand and a bunch of bananas in her mouth, which she had just 'sneaked' from a dining-room."

Better than a Fence.

The same writer continues: "We met an Englishman who was trying to protect his sugar-cane patch with a great trench and a palisade covered with nails. All to no purpose. He walked down to it one morning, and found a row of monkeys seated on the palisade. The moment he came within reach they threw his own sugar-cane into his face, after which they got down and strolled away, leisurely munching. Such things were not to be borne. Our friend chased a flock into a tree, felled the tree, and caught four or five young monkeys. The parents waited near, in great consternation, anxiously watching while their infants were painted from head to foot with treacle and tartar emetic. On being allowed to go, they rushed off into the fond and welcoming arms, and were instantly carried up into the woods, and there assiduously licked clean from top to toe by their affectionate parents. The natural effects followed, and the pitiable condition of the old monkeys can scarcely be imagined. That patch of sugar-cane was never rifled again."

"They rushed off into the fond and welcoming arms, and were instantly carried up into the woods."

A Parrot Story.

A parrot, who used to be kept in the nursery and evinced much interest in the children—especially the baby—was one day removed to the kitchen. He had only been in his new quarters a short time when a loud cry, "Oh, dear, the baby! the baby!" was heard in the basement. Rushing to the scene of the disturbance, the servants found the parrot wild with excitement over a sucking-pig, which was roasting in front of the fire.

Guarded Her Friends.

A stray kitten that used to sleep part of the day with two pet rabbits appeared to be very much at home with them. One evening the rabbits got out of their hutch and ran about the garden. Shortly afterwards the kitten was found crouching on the ground with her paw on a rabbit's back and closely watching the other, which was in a corner, thus preventing them from escaping from the garden.

NOTES AND COMMENTS.

Photograph by J. Peat Millar, Beith.

YOUNG THRUSHES.

The "Pumpkin Seed."

FOR the photograph of the group of Common Sun-fish, or, as they are called locally, "Pumpkin Seeds," we are indebted to Dr. R. W. Shufeldt. The following quotation we take from Drs. Jordan & Evermann's "American Food and Game Fishes":—

> "Slowly upward, wavering, gleaming
> Rose the Uqudwash, the Sun-fish;
> Seized the line of Hiawatha,
> Swung with all its weight upon it.
>
> . . . .
>
> But when Hiawatha saw him
> Slowly rising through the water,
> Lifting up his disc refulgent,
> Loud he shouted in derision
> 'Esa! esa! shame upon you,
> You are Uqudwash, the Sun-fish:
> You are not the fish I wanted;
> You are not the King of Fishes.'"
>
> *Longfellow.*

"And Hiawatha was quite right. The sun-fish is by no means the king of fishes. But there is no fish which has been oftener sought by the young angler, or which has brought more joy to the American boy of every generation. The 'pumpkin seed' is pre-eminently the small boy's fish, though it is by no means despised by children of larger growth. Never reaching a size that quite satisfies anyone except the boy, yet biting with a vim which makes one regret that it is not large; for a two or three pound 'sunny' would surely be a fish to try the skill and delight the heart of any angler.

"The 'pumpkin seed' is a familiar inhabitant of clear brooks and ponds from Maine to the great lakes, and southward east of the Alleghanies to Florida. In the Mississippi Valley it is found only in the northern portion, being fairly abundant in Ohio, Indiana, Illinois, Iowa, and northward. It is said to be rather rare south of Virginia. It reaches a length of eight inches and a weight of six or eight ounces, and is 'a very beautiful and compact little fish, perfect in all its parts, looking like a brilliant coin fresh from the mint.'"

Photograph by Percy Ashenden.

SILVER FISH.

The Silver Fish.

THE other fish here represented comes from the Eastern Hemisphere—to be more precise, South Africa. It is the silver fish of the Cape market, one of the commonest fish at all seasons. *Dentex argyrozona* is the name by which it is known among scientists.

The Ancestor of the Domesticated Cat.

IN connection with a paragraph on page 254 a correspondent writes:—"*Felis chaus*, which is a species common to India and Africa, is not the ancestor of domesticated cats. It is *Felis maniculata*, or correctly, according to modern nomenclature, *F. libyca*." The writer of the note says he has no wish to contradict this statement, and that as ancestor of the domestic cat (or some of them, for the Indian domestic cats have evidently other ancestors) he meant the Egyptian cat. "The reason," continues the writer, "I called it '*Felis chaus*' was this: Some four or five years back I was surprised to notice, in the Cats' House at the Zoo, both the two Egyptian cats and the Indian Jungle Cat labelled '*Felis chaus*.' I happened to meet the Superintendent in the Cats' House, and asked how this was, and he replied that the two breeds were the same. Although this was against my preconceived opinion, I thought he ought to know best, and no one ever objected to the Egyptian cats being labelled '*F. chaus*,' for the labels remained on their cages till the day of their death. I am well aware that the true *chaus* cat approaches the *Lynx* group in its short tail and slight tufts on ears." As the writer goes on to remark, it seems curious and not right that the nomenclature at the Gardens should be incorrect—especially in a case of this sort, where common animals are concerned. We always understood that the Secretary, and not the Superintendent, was responsible for the labels. We may perhaps mention here that there is a chapter on the Ancestors of the Cat (and also one on the Pedigree of the Dog) in the new volume of Zoological Essays which Mr. Lydekker is bringing out.

AMERICAN COMMON SUNFISH (*EUPOMOTIS GIBBOSUS*).

ZORILLA.

The Zorilla.

Mr. C. H. T. Whitehead sends us the accompanying snap-shot photographs of a Zorilla, together with the following description of the animal:—"The Zorilla, or Muishona, as it is generally called by the Dutch, is a native of Central and South Africa. It is a pretty little creature about the size of a ferret, jet black in colour, with four white stripes down its back, white tips to its ears, white eyebrows, and a grey tail. Unlike the ferret it carries its tail vertically above its back as the meerkats do. It is closely related to the skunks, and, like them, can emit a disgusting smell, and this it does when anything particularly annoys it. It is common in South Africa, but not often seen because it is nocturnal; hence its colour. A favourite abode is in an old wall near a farm, and, if not speedily ejected, they generally do a great deal of damage in the poultry yard. Very bold by nature, they are often caught right in the town at Port Elizabeth. The one shown in the photographs was snared by a native when quite young, and presented to a sergeant of my regiment. Within three days of its capture it had become quite tame, and would follow its master about. It was soon allowed to come and go as it pleased. The daytime was generally spent in some rat-hole (it quite cleared the place of rats). In the evening it used to come into the blockhouse for its meal and to play about; but it so disturbed the men when asleep by playing with their fingers and toes that its master presented it to me. I kept it for about four months, and used to allow it to go on its mousing expeditions. Unfortunately, from one of these it never returned. It was a most affectionate little animal if allowed a certain amount of freedom; but if closely confined it became savage. The drawback to it as a pet is its smell."

The Song-Thrush.

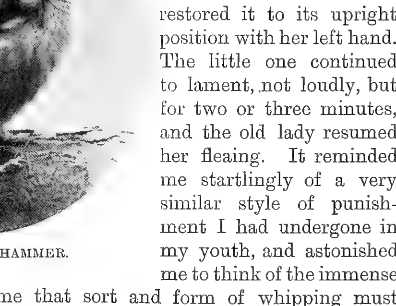
The thrushes are a large family, and include among its various branches birds which the "man in the street" does not generally associate with the common or country song-thrush, such for example as the blackbird, the robin, the nightingale, and the hedge-sparrow; in all there are not less than forty-four species which can claim the additional title of "British." Of the thrushes proper, if one may use the term (and by it is meant the genus *Turdus*), two only are regular residents in Britain, two are summer and two are winter visitors, and three are occasional "stragglers." The Song-Thrush, the subject of our illustration, is one of the two summer visitors, though a few of their number sometimes winter with us too. These birds lay in March, and rear two

ZORILLA.

or three broods during the season. Pieces of rotten wood cemented with cow-dung are the nucleus of its nest, which forms when finished a neat water-tight abode unlike that of any other bird. Lord Lilford, writing in 1895, says: "We seldom have many song-thrushes after the beginning of November, but two came constantly to be fed. There is no doubt that this species has suffered more than any of *our* common birds [*i.e.*, after a severe frost]. I have only once heard its song, and I only hear of some half-dozen nests about our pleasure-grounds, as against a usual average of twenty-five to thirty."

The Yellow-hammer.

ONE of our most conspicuous British birds is the Yellow Bunting, or, to give it its more common name, the Yellowhammer (*Emberiza citrinella*). Not content with Nature's generous gift of colour, by which it may be "spotted" a long way off, this bird courts observation by the habit it has of always choosing a prominent perch on the top of a bush or shrub. It builds later than the song-thrush—generally about the middle of April—and the young are hatched some two or three weeks later. The nest is a fairly large one, either on or near the ground, lined on the outside with dry grass and moss, and on the inside with horsehair. The eggs (of which there are at least two clutches in the season) are of a purplish colour, with curious hair-like markings; the young birds do not show any yellow until after their first moult in the autumn. Strictly speaking, in calling this bird a "yellowhammer" we are falsely aspirating the latter portion of the name, which, as Mr. Howard Saunders points out, undoubtedly has a common origin with "Ammer," the modern German word for a Bunting. Mr. J. Peat Millar, of Beith, is the photographer of the bird reproduced on this page, and also of the thrushes on page 316.



YOUNG YELLOWHAMMER.

A Monkey Punishment.

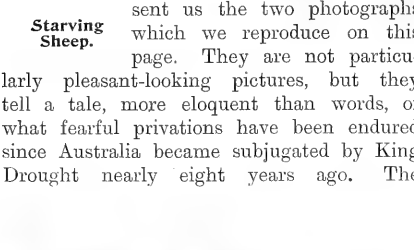
APROPOS of certain articles which have appeared in ANIMAL LIFE anent apes and monkeys, the following communication from a Felixstowe correspondent is not without interest: "I was standing under a tree," writes Mr. Howorth, "in a small wood, in India, many years ago, and it was full of monkeys (the common brown sort of the north-west), and on a low bough of the tree an old female was sitting fleaing herself, and a very young one by her. What the young one did to offend her I don't know, for I was not looking at them, but her movements caught my attention. She seized the infant in her hands, laid it across her knees, and slapped it five or six times about the junction of the tail with the back, then restored it to its upright position with her left hand. The little one continued to lament, not loudly, but for two or three minutes, and the old lady resumed her fleaing. It reminded me startlingly of a very similar style of punishment I had undergone in my youth, and astonished me to think of the immense time that sort and form of whipping must have gone on for it to be seen in a low form of monkey."

Animal Classification.

THE mysteries of French zoology are past finding out. It has taken three Courts of Justice to define the status of frogs. Certain trappers of frogs, having been arrested for "fishing" at night, in violation of the Conservancy laws, were indicted before the Tribunal of Auch, which decided that frogs were not fishes. The case was taken, on appeal, to the Court of Agen, which was of opinion that frogs were fishes. Thence it went to the Court of Cassation, whose judgment was that frogs were not fishes.

Photograph by Wall Bros., Melbourne.

DROUGHT-STRICKEN SHEEP AT SOUTH ST. KILDA.



Starving Sheep.

MR. GEORGE WALL, of Melbourne, has sent us the two photographs which we reproduce on this page. They are not particularly pleasant-looking pictures, but they tell a tale, more eloquent than words, of what fearful privations have been endured since Australia became subjugated by King Drought nearly eight years ago. The following fact is also very significant. Mr. David Hendry, to whom the sheep belonged, started from Wakool River in April, 1902, with 3,400 sheep; in September, when within about eight miles of Melbourne, the number had diminished to 2,300; that is to say, in less than five months 1,100 sheep had succumbed to the effects of the drought; this is an average of over 200 deaths per month, or nearly 80 per cent. per year.

Our Coloured Plate.

THE frontispiece in this number, which is referred to in Mr. Lydekker's article on the Coloration of Mammals, is from an original painting by Sir Harry Johnston. It is an excellent specimen of the sixteen which he has done to illustrate his volume on British Mammals in The Woburn Library. In addition to these coloured plates, there will be many reproductions from photographs taken specially for the work, and printed separately on art paper. We understand that the author, who is solely responsible for this volume, will deal briefly in the three first chapters with the extinct mammals of Great Britain, devoting the rest of the book to British mammals of to-day, beginning with the bats and insectivores, going on to the cats and other carnivora, the phocidæ and cetacea, the rodents, and finally deer and cattle.

Photograph by Wall Bros., Melbourne.

GRAZING ON THE BANKS OF ELLWOOD CANAL, ST. KILDA.

LESSER BLACK-BACKED GULL (*LARUS FUSCUS*).

From a photograph from life by R. B. Lodge, Enfield.

BIRDSNESTING—WITH A CAMERA.

Written and Illustrated with Photographs
by
CYRIL DAY.

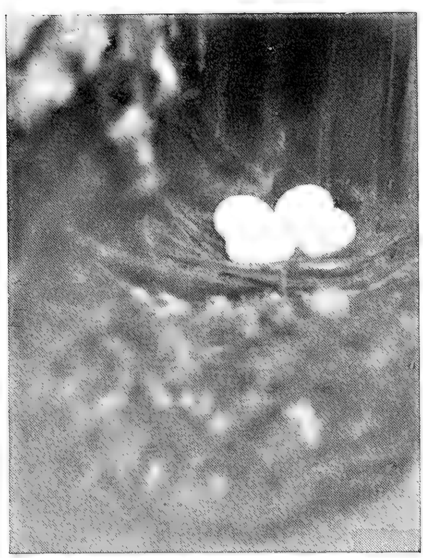
TO all lovers of Nature what can be more delightful and enjoyable than a ramble in the country; and, as we take our country walks, how much more interesting it would be if we were to take up some hobby to enable us to come into closer touch with the wonders of Nature. There is a whole field of studies lying, as it were, at our feet—botany, entomology, insects and beetles of all descriptions; but the one of which I am more particularly thinking is ornithology. This is a study for which a lifetime is not too long. In a short article, therefore, one needs must touch upon but a very small branch of the subject, and I propose only to say a few words about some British birds' nests and their eggs, which I have secured—on paper.

NEST OF SPARROW HAWK.

In nature-photography a certain amount of difficulty has to be overcome before one is able to achieve success: first one's nest has to be found; this, in the case of many birds, is not nearly such an easy matter as the uninitiated might think. The way some of our feathered friends manage to conceal the identity of their nests is nothing short of marvellous, and it takes a practised eye to discover the whereabouts of some of them, as they frequently so resemble their surroundings that the ordinary observer would never notice them at all, even when absolutely looking at them. Other birds, such as larks, plovers and several other kinds will lead one away from their nests by feigning lameness or being wounded, and so taking one off the scent, as it were; but after some study of their habits one soon gets an idea of where to look for certain nests.

Nature seems to have watched over all birds in one way or another. Apart from the similarity of nests to their surroundings which I have already mentioned, the eggs are also often provided with protective coloration, especially when there is no nest, or simply an apology. Again, numerous other birds protect themselves and their offspring by nesting in holes either in trees, stumps, walls, or even in the ground itself, sometimes using a rabbit burrow or other animal's hole, or even excavating the ground themselves. During incubation many birds are protected by their plumage, such birds as kingfishers, woodpeckers, and other conspicuously-coloured birds building out of sight in covered nests or holes. The magpie not only has its nest covered in, but enters it from a hole in the side which is so well

NEST OF PEAHEN.


NEST OF BARN OWL.

protected by thorns, etc., that it is practically proof against the attacks of enemies.

Nest-hunting with the camera gives one the opportunity sometimes of disproving popular errors; for example, it is generally understood that the common snipe lays four eggs, and *always* arranges them with the small ends inwards; but this is not so. I once found a nest with four eggs in which all the small ends pointed towards one direction. I think, however, that this must be very exceptional.

To come now to the photographs which illustrate this little paper. The nest of the Sparrow Hawk is placed in some elevated spot, generally in a fir or larch, and contains three to five eggs—sometimes six, as in the one photographed. I think this to be the maximum number. The ground tint is greyish-white with a tinge of blue, and a number of bold patches of very dark red-brown rather irregularly distributed, but generally forming a ring round the larger end. There is often one egg with much lighter marking than the rest of the clutch. This hawk generally builds its own nest, though it often utilises that of a crow, magpie, or rook.

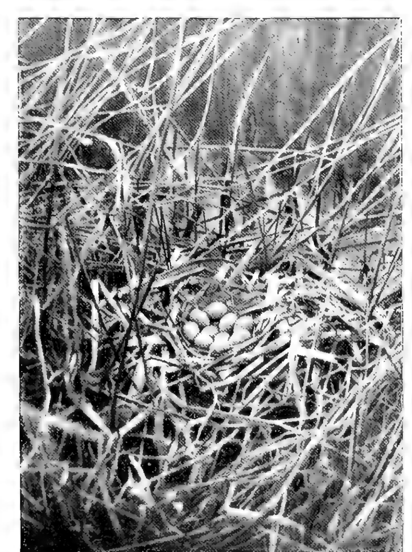
The Peahen, whose home is depicted in the second photograph, always roosts in trees, but makes her nest on the ground, generally on a bank raised above the common level; here she lays about twelve eggs, sitting very closely until they are hatched. The three eggs in the photograph were laid on a few leaves collected on a raised flower bed.

The third photograph is of a Barn Owl's nest and eggs. The nest, if one be made at all (for oftentimes a mere hollow serves the purpose), is built of a few sticks and twigs, with a little grass or straw, but seldom with hair or wool; and this is all it fabricates, and that to but a small extent either of bulk or surface. The eggs are white and of a round shape, generally two or three, and sometimes five or six, in number. The photograph was obtained at a height of over thirty feet in a hollow elm, but the nest being situated so far in, it was necessary to

NEST OF SAND MARTIN.

GOLDFINCH

ROOK.



COOT.

SWAN.

SOME BIRDS' NESTS.

reflect the sun's rays on it and its contents with a mirror in order to penetrate the darkness, the camera itself being tied in the boughs outside the hole. I am inclined to think that some of the sticks shown in the photograph may have lodged there before the owl commenced to nest, as there were jackdaws building close at hand.

The next photograph is that of a soft little nest of the Sand Martin. In order to obtain a photograph of this it was first necessary to scrape away the sand until the extremity of the hole was reached; then I had to stick one leg of the camera in the sandbank and affix long poles to the other legs; in this way I managed to get the camera high enough to expose the plate.

MOORHEN'S NEST.

Next comes the photograph of a Goldfinch's nest, with its eggs. This particular nest was placed on a horizontal bough of an apple tree; but the goldfinch generally builds more at the end of the branch. Sometimes the bird selects a yew tree; its nest is rarely found in hedgerows. The one in the photograph was absolutely hidden from the sight of one standing below and looking up at the bough.

SKYLARK'S NEST.

The photograph of the Rook's nest shows only two eggs, as it was taken before the birds had finished laying; there are generally four or five eggs, but these are too well known to need description. Perhaps everyone may not have thought why rooks so often nest in the vicinity of old mansions and other buildings. I am inclined to think it is on account of the old trees found around these old mansions; or perhaps they think man affords them more safety than if they were in uninhabited parts. They cement the sticks of their nests together with mud and clay, lined with grass and roots.

In the Coot's nest it will be noticed how wonderfully the rushes and sedges have been woven together to form a nest, and that great care has been taken in building it above the level of the water to prevent submersion should the river rise. The ten eggs, of a stony colour speckled all over with a brown colour, are distinctly shown.

The last photograph on page 323 shows a Swan on a nest composed of a large heap of dead and decaying sedges, reeds, rushes and dry flags, on which are deposited six or seven eggs, generally about four and a half inches long, of a greenish-white colour. The swan is a very close sitter, and is usually protected by its owners; but the one photographed was in a perfectly wild state.

The nest of the Moorhen is much smaller than the coot's, and is not nearly so neatly made. It seems more after the swan's style—a mass of aquatic weeds, etc., with a decided hollow to contain the eggs. When built in a dry place much less material is used; usually six to ten eggs are laid, of a buffish colour speckled with reddish-brown.

The nest of the Skylark is composed of a little dry grass, and is sometimes lined with horsehair, or roots, but often neither

RINGDOVE.

HEDGE SPARROW.

WILD DUCK.

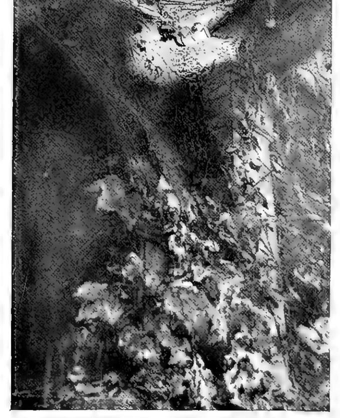
PARTRIDGE.

SOME BIRDS' NESTS.

is used. It is formed in a depression in the ground, as that of a cart-wheel or hoof-print, and contains three to five eggs, the nest being often covered with a tuft of grass. The egg can be distinguished from that of a woodlark by a belt of olive colour around the larger end. This lark is a close sitter when its nest is well hidden, or on rough ground, but not so if it is exposed.

In the first of the photographs on page 325 (nest of Ringdove) it will be seen that the nest is well hidden in a spruce fir, and the light shining through shows the eggs to greater advantage. Sometimes the nest is so thin that the eggs (which never exceed two in number) can be seen through the nest from below.

Now comes the nest of the Hedge Sparrow, containing four eggs of a light blue colour. The nest is too well known to need any description; it may, however, be mentioned that it is in this nest that the well-known cuckoo so often deposits its egg. I say "deposit," for I am quite certain it does not lay its eggs there, because they have been found in the nests of the common wren and willow warbler, on which the cuckoo could not sit to lay its egg. A good description of this bird is found in "The Living Animals of the World," page 495.



SWALLOW'S NEST, WITH YOUNG.

The Wild Duck finds material wherewith to line its nest from its own body. In the photograph the characteristic down is well shown. This down is plucked from the bird's own body, and is woven together with twigs and grass to form the nest, which is usually found on the ground near water, although such is not always the case, as it is occasionally found in holes in willows, etc. The eggs are rather smaller than those of the domesticated duck, and of a greenish colour. I have only once found a nest without down. This bird is also known as the Mallard.

The Partridge, whose nest is shown here, has not made as much nest as these birds usually do. It was taken under a blackberry bush on a typical Dorset hillside.

The last photograph—that of a Swallow's nest—shows three of the young ones as they sit on the edge waiting for their mother's return with the fourth little one she was taking round the house for a fly. The nest was built in the corner of a porch of a friend's house. Here, again, reflection was required to show the nest and young ones to greater advantage.

It will be noticed at once that these photographs show some of the nests to greater advantage than others, the reason being that some of the situations were more or less in semi-darkness, long exposure being absolutely necessary, and thus often allowing the wind to interfere by moving the leaves, etc., around the nests, and therefore curtailing necessary sharpness required for a good print.

OXEN IN PLOUGH ON THE COTSWOLDS.

THE DRAUGHT OX—A SURVIVAL.

Written and Illustrated with Photographs by T. A. Gerald Strickland, F.E.S.

"'And so we plough along,' as the fly said to the ox!"—*Longfellow.*

WHEN the very horse is said to be doomed by the advent of the motor-car, -waggon, and -plough, and we are told that in a comparatively few years it will only be possible to see a living example at the Zoological Gardens, under some such label as the following—

> THE HORSE (*Equus caballus*).
>
> These animals, in the domesticated state, were at one time extremely common, being used as beasts of burthen, haulers of various vehicles, and for other purposes, domestic and agricultural. They are now practically extinct, and our specimens were presented to the Society by H.M. the King.

it is interesting to find that the draught ox, though also doomed by "those who knew" many, many years ago, can still be found in England, and not in a "collection" either, but actually at work on the land.

Threatened individuals live long; yet, though these somewhat fascinating, gentle, and certainly picturesque creatures are still with us, they are really becoming scarce. They

THE BRAIN OF THE SPAN.

WAITING.

IN SINGLE FILE.

still lumber on, slow but untiring, the pride of their ox-man, and the one bit of colour to lighten up a bare, bleak landscape consisting of immense stone-wall-, or scrubby hedge-encircled "grounds"—"grounds" so large that a dozen ordinary fields might be lost therein—or the even barer South Downs.

Some of the working oxen whose friendship I am honoured with, live in a calm, old-world, ruminative manner, right up on the Cotswold Hills; others lower down in the more fertile part of the county. The contrast, within quite a few miles, between the higher altitudes of the great Cotswold range and the verdure-clad valleys is marvellous; high up on the bracing, exhilarating wolds, where the roads are white and straight and the landmarks few and far between, some teams of oxen may be found at plough, or harnessed to carts and waggons—occasionally yoked with horses, a mixed team indeed!—hauling the wheat or oat harvest to the stack-yard, which is probably sheltered by the grey stone scarlet-creeper-mantled farmhouse behind the little bunch of somewhat scrubby trees to be seen in a neighbouring dip in the hills. However, the oxen I am best acquainted with (those whose photographs illustrate this article) reside in a more genial part of the county, where the stone walls have given place to ragged hedges and the soil is red.

Fairly early in the morning, before the dew is off the grass, or the spider's lace-work trimming on the brambles has become invisible, the ox-man and his boy "inspan," and the great plough is got to work. Hour after hour, in practical silence save for the clank of chain and a cry of "Now, Chomp-yin!" from the ox-boy, the oxen plod along till the dinner-hour is reached, when the great beasts lay themselves down with some groans, just as they are, in their harness, for a delicious hour of rest and cud chewing.

On one occasion I decided that I would not leave the neighbourhood without a photograph of the oxen lying down in their furniture—though they are somewhat shy with strangers. The day chosen opened somewhat gloomily, but I was assured by the

SPAN OF OXEN IN GLOUCESTERSHIRE.

A TEAM OF BROWN OXEN.

local weather prophet that it was only the "pride of the morning," so about 11.30 found me and the necessary camera crossing the "big ground." The dinner-hour commenced at 12 o'clock; but, in spite of the weather prophet, by that time the elements had made up their minds that it was a suitable date for a spell of wet. The camera, wrapped in its velvet cloth, was placed *in* the hedge, whilst the ox-man, boy and myself crouched under the bushiest part. The wind blew in angry gusts; the rain found its way in cold streams down the backs of our necks; meanwhile the good red earth got darker and darker, and clouds of steam rose from the hot bodies of the span—a span that absolutely refused to lie down.

To pass the time, I asked the ox-man if his charges were always as quiet and docile as they appeared to the onlooker. He looked far away to the beyond, and pulled thoughtfully at his pipe for a time; then he remarked: "They'm funny creturs to brek in." "Tell me an experience," I suggested. So this is how I came to hear about the breaking of the white ox:—

"I mind as if 'twor yes'day," began the ox-man. "'Twas just such a marnin' as this un. We'd been gentling and mussing wi' Joseph—that's the white un—for weeks; kind o' preparin' 'im. We borrowed a man or two to lend a 'and."

"Them wor Gearge Jones and John Iles," interpolated the boy at this point—now the name of the ox-boy was Bill.

"So 'um wor," continued the man. "Well, we got un up to the plough pretty fair easy, and 'arnessed un—you see we'd mussed 'im smairtish—but when we came to start un, why, then the ploy begun! There were a trained ox afore an' another beyind; but didn't make a morsel o' difference, for that little white devil simply dragged 'em both 'cross ground for matter of a 'undered yards and then—what do you think?—'e lay down! We tried saft sawder, an coaxin', an' 'ittin', an' punchin', an' thumpin', but 'tworn't no manner o' use—for 'e just lay and snarted and rolled un's eyes—so at larst

TURNING THE PLOUGH.

THE DINNER-HOUR.

us 'ad to light some straw under un's nose and smoke un up, that us did. This perfarmence went on for some time—'e run a bit an' 'e lay a bit, but lor, I've 'ad many a worse un."

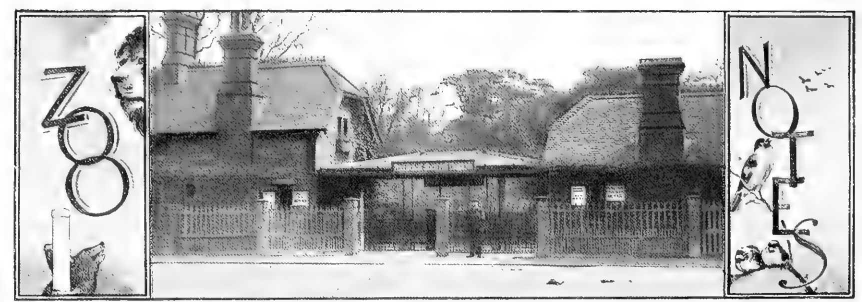
I handed the ox-man my tobacco pouch.

"I wor a-thinkin—" remarked the ox-boy, after a pause; but, unless Trine's theory is true that our thoughts become material and set far-reaching forces in motion at the moment we think them, the world will never benefit by Bill's thought, for just then the rain lessened, a ray of sunshine glanced coyly through a rift in the clouds, and—two of the oxen lay down!

When a light plough is used, three or four beasts are sufficient, and they are driven in single file, while the lucky ones that are not required look over the hedge of the next field at their labouring kindred with an air of conscious superiority, no doubt metaphorically patting themselves on the back.

Oxen are more intelligent than they are given credit for, and "Champion" (or "Chomp-yin," in the vernacular), the leader of the span, knows his own and his yoke-mate's work perfectly. It will be noticed in the illustration "Turning the Plough," that the ox-man and boy are attending to the plough and wheel pair of oxen respectively, while the leaders are left to themselves. This is because "Champion," the big red beast, is there in charge—and well he knows it.

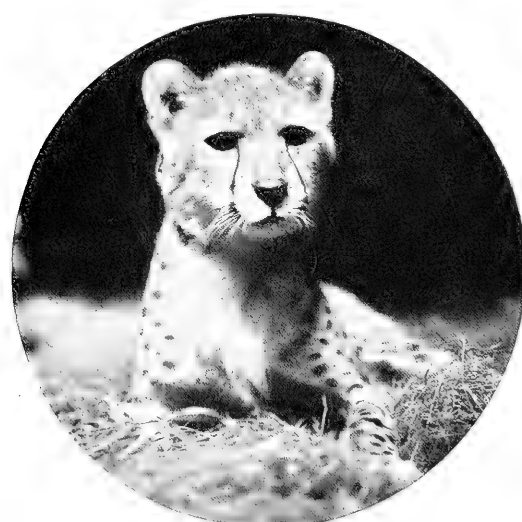
No doubt eventually the use of oxen for draught purposes will quite die out, but I hope it will be some years yet before a fly can no longer quote, "And so we plough along."



Described and Illustrated with Photographs by W. P. DANDO, F.Z.S.

Cheetah, or Hunting Leopard.

THE beautiful pair of Cheetahs which Colonel Mahon presented to the Society are both dead. In its natural wild state, the cheetah's food consists of the smaller quadrupeds and such birds as it can catch alive; and when kept

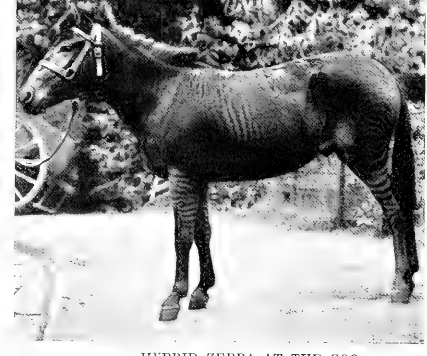


CHEETAH.

abroad by the hunters is similarly fed. In this country there is a certain class of persons who think it most cruel to feed animals on live food, even when the animals will starve to death unless fed on food they kill themselves (which was literally the case with these two specimens, for they absolutely refused to eat). I understand the Zoological Society has been summoned by another society for feeding the python on live goats. We shall, no doubt, have some very interesting evidence on the subject. The cheetah is an elegantly-formed and beautifully-marked creature, and is called by the natives "Youze," or hunting cat. Although the title of "Hunting Leopard" is popularly applied to the cheetah, it can lay little claim to this pardine title, as the speed of the animal is not very great and it has but little endurance, and is unable to climb trees like the leopard on account of its claws being but partially retractile, and they are less curved and pointed than those of the leopard. The Cheetah's limbs are long and slender, and devoid of that muscular power which lies latent in the limbs of the true leopard, shown to advantage in the photograph of "Major" on page 89 of ANIMAL LIFE.

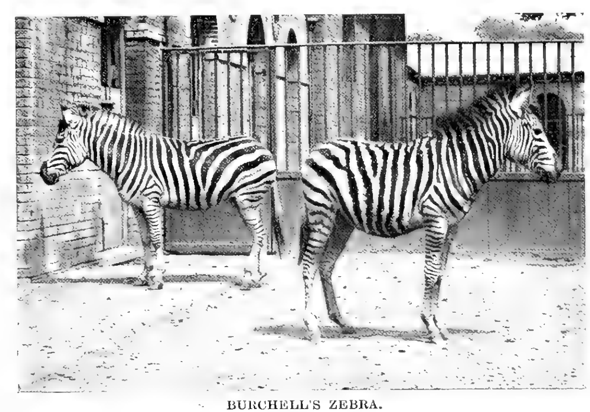
The King's Cross-bred Zebra.

MUCH interest has been aroused at the Zoo by the presentation by His Majesty the King of a hybrid Zebra, a cross-breed between a stallion horse and a Burchell's zebra mare.



THREE VIEWS OF THE KING'S HYBRID ZEBRA AT THE ZOO.

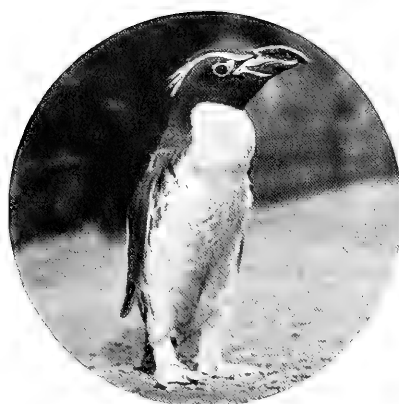
This animal was sent over to England by Lord Kitchener, who discovered it among the remounts placed at his disposal in the Transvaal during the war. The zebra markings are fairly distinct on all four legs, also slightly across the loins and at the root of the tail, continuing a few inches up the centre of the buttocks. These markings (and the tail itself, which it will be noticed is more like a donkey's than a horse's) are the only characteristics of the zebra which are prominent, the animal lacking the erect mane and other distinguishing features. Since the animal has been in captivity he has become most ferocious and savage—no doubt from the want of proper exercise. By the courtesy of the Society's officials I was enabled to get my pictures in the yard adjoining the stables, the animal being securely held; and I took my position at a respectful distance.



BURCHELL'S ZEBRA.

Death among the Penguins.

It will be remembered that last year two new King Penguins were housed with "Kingie," the most popular bird in the Zoo. Unfortunately neither of them lived for long, and now, sad to relate, "Kingie" has followed them to their grave. This bird was a universal favourite, and had been in the Gardens for over six years. I do not give his portrait here, as an excellent one of him is to



SCLATER'S PENGUIN.

be found on the title page of Volume II of "The Living Animals of the World." Sclater's Penguin, the specimen photographed, must also, alas! be included among the late lamenteds. It had a superciliary streak of golden yellow, which developed into an erectile crest on each side of the head; but this streak, instead of commencing in a line with the nostrils, as in some other species, sprung from the base of the upper mandible immediately above the angle of the mouth. Dr. P. L. Sclater, in writing to Sir Walter Buller, K.C.M.G., called that gentleman's attention to the fact that "this bird, just received from the Auckland Islands, seems quite distinct from the New Zealand species." This fact having been proved by the above authorities, it became necessary to select a distinctive name for this penguin, and Sir Walter accordingly described this species, in his "Birds of New Zealand," as "*Eudyptes sclateri*." The heavy death-roll among the penguins leaves a big gap in the Society's collection. The entire family of these curious and most attractive birds is now represented solely by the specimens of the small black-footed penguins which are kept in the Fish House.

THE MANY-ZONED HAWK.

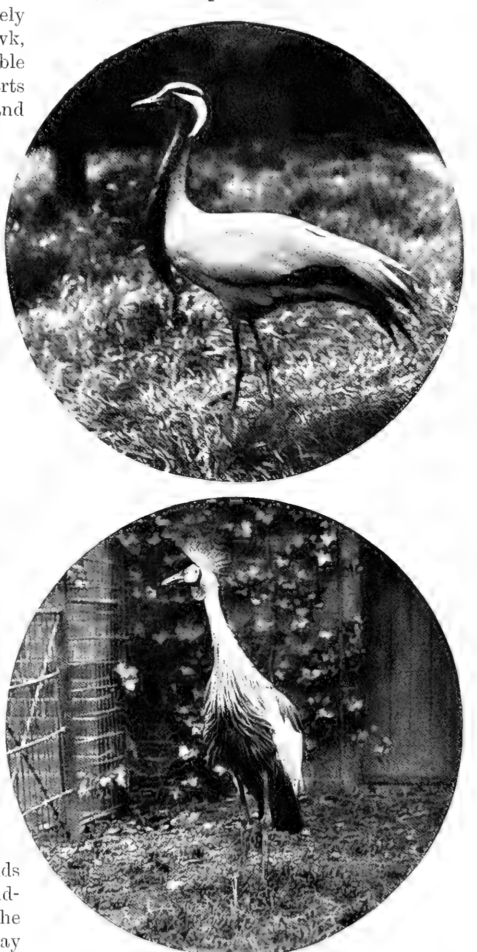
Sun Bittern, or Peacock Heron.

THIS pet bird of the Brazilians (who call it Pavao—that is, Peacock) is about sixteen inches long, with a head like a heron and a rather long, powerful beak; the plumage is minutely variegated with bars and spots of many colours. When kept in captivity it soon becomes tame, and has several times made its nest and reared its young (which are clothed with mottled down when hatched) in the aviaries at the Zoo. Until the late Mr. Bartlett detected in the Kagu bird an affinity to the Sun Bittern (*Eurypyga helias*), the latter bird was thought to have no close ally. Strange, indeed, is the following weird and remarkable account given of this bird in an old natural history book: "I was interested in an account I heard the other day of a bird, a species of heron. . . . . It is called the Bittern; but what is very extraordinary, it has the power of emitting a light from its breast equal to the light of a common torch, which illuminates the water, so as to enable it to discover its prey. . . . . I had a difficulty in believing the fact, and took some trouble to ascertain the truth, which has been confirmed to me by several gentlemen of undoubted veracity, and especially by Mr. Franklin Peale." If any of our readers can add to this testimony it will be very interesting.

SUN BITTERN.

Many-Zoned Hawk.

One of the most beautiful hawks ever deposited in the Zoo was to be seen in the aviary nearest the south entrance. It is a native of Morocco, and is named the Many-Zoned Hawk (*Melierax polyzonus*). It is very closely allied to the South African whistling hawk, but differs from all other species by its sable plumage, the general colour of the upper parts being pearly-grey, the chest ashy-grey, and the abdomen white, barred with bands of a darker grey, giving it a very handsome speckled appearance. Like all the hawks, it kills its own food, which may be any other kind of bird it has the pluck to tackle, or even one of the rodents. Low in flight, like the buzzard, it does not keep on the wing through any great distance. This bird, with many others in the vultures' aviary, is kept in warmer quarters during the winter, but will be out again, I hope, as soon as the warmer weather sets in.



Three Cranes: ASIATIC WHITE CRANE (on left); DEMOISELLE CRANE; and CAPE CROWNED CRANE (the latter is shown in the photograph at the bottom of the right-hand column).

African Cranes.

Two of the most beautiful of the *Gruidæ* family are the Cape Crowned and Demoiselle Cranes; the family being closely allied to the *Ardeidæ* (herons). The long-necked birds, with their pointed bill, which readily pierces fish and brings them from under

stones and brinks, are also provided with long toes, which enable them to stand more firmly in the water; and the long crooked talons with the middle one serrate give them the power of holding eels and other slippery fish, and also to roost on trees. They are very nervous birds, and are always on the *qui vive*, and this fear and watchfulness no doubt accounts for the lean condition of their bodies, notwithstanding which the flesh was at one time considered very savoury, if not delicate. At the enthronement of George Neville, younger brother of the Earl of Warwick, and Archbishop of York, two hundred and four cranes were served at the feast; and in the "Northumberland Household Book" the price of the crane ("cranys") is marked at sixteen pence—only the price of a "Bordeaux" ("King's Cross") pigeon. Although at one time plentiful, the crane can no longer be regarded as a visitor to our islands.

DOMESTICATED AFRICAN SHEEP.

Asiatic White Crane.

The Asiatic White Crane, although belonging to the same family, cannot be called beautiful or graceful in carriage. These birds take up their winter quarters under the burning sun of India, but pass the summer in the northern parts of Russia and Germany. After the arrival of the flocks in these countries, they break up into pairs, and the nuptial ceremonies are accompanied by loud and frequent trumpetings. A gentleman residing in England had for some years been possessed of a pair of cranes; one of them at length died, and the survivor became disconsolate. He was apparently following his companion, when the master introduced a large mirror into the aviary. The bird no sooner beheld his reflected image than he fancied she for whom he mourned had returned to him; he placed himself close to the mirror, plumed his feathers, and showed every sign of happiness. The scheme answered completely; the crane recovered his health and spirits, passed almost all his time before the looking-glass, and lived many years after, at length dying from an accidental injury. It would at least be amusing to see such an experiment carried out at the Zoo, although I am afraid the Gardens are "run" too much on scientific lines to allow of such an expedient in the case of widowhood.

Domestic African Sheep.

The domestic African sheep now in the Society's collection will be interesting in the future, when African farming is fully cultivated, as a reference showing whether any material changes have been made in the breed of sheep raised in Africa, especially as some people are of opinion that Africa will in the future compete with our other Colonies in mutton. The specimen illustrated I do not think was ever shown to the ordinary visitors at the Zoo.

[Owing to the pressure on our space this month we regret that the "Notes and Comments" have been unavoidably held over.—Ed.]

BLIND WORMS.

BY

THE REV.

S. CORNISH WATKINS.

THE study of reptiles is a branch of Natural History that, in this country, might well be studied more assiduously, as there is still a good deal to be learned about their habits and mode of life. Many people have a curious horror of cold-blooded vertebrates, and instinctively dislike anything that reminds them of a snake. Whether this feeling has any connection with the serpent of the book of Genesis, or is only a relic of the terror that venomous reptiles in all ages have inspired, its result is to discourage investigation—certainly among those who have not any very special interest in zoology. Most of our British reptiles are shy and retiring in their habits, and rather shun than court observation, so that, except for an occasional toad or frog, dwellers in most parts of the country scarcely ever set eyes upon a reptile at all.

Pre-eminently secretive in all its habits is the Blind Worm, the subject of this article. It is not often seen, and then generally withdraws itself as speedily as may be, seeking concealment under stones or among the roots of long grass. From the blind worm's point of view this timidity is very excusable, for no creature is the subject of a more senseless and persistent persecution.

In most people's eyes the blind worm is a snake, and a snake is venomous, and therefore ought to be destroyed at sight; and so this most harmless and inoffensive of creatures lives with a sword constantly suspended over its head, and only appears in public at peril of its life. It should be unnecessary to state, but unfortunately is not, that a blind worm is not a snake at all, but only a legless lizard. Its mouth has not the wide gape of the true serpent's, and is only provided with very minute teeth, and, of course, is quite destitute of poison-fangs. Its very name is misleading, for it is rather quick-sighted than otherwise, and its eyes, though small, are bright and beautiful. It is curious indeed how the blind worm could ever have acquired the evil reputation that it bears among country people, and is an instructive commentary upon the ignorance that prevails among the uneducated about the living creatures that inhabit their fields and hedge-rows. In many districts the blind worm is even more dreaded than the adder, and most remarkable stories are told about its savage and dangerous disposition. It is popularly credited with the power of standing erect upon its tail and leaping to great distances, while it is said to be a special provision of

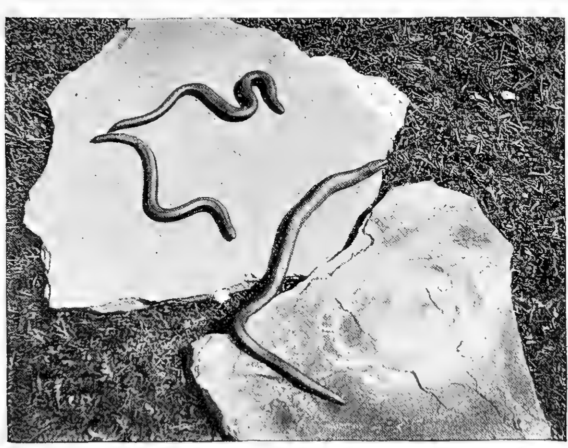
Providence that the creature should be blind, and so unable to direct its attacks with accuracy. For instance, a popular Herefordshire rhyme says:

> "If the blind worm had the adder's eye,
> Neither man nor beast would pass him by."

and no amount of proof will serve to convince the rustic mind that a blind worm is neither blind nor venomous.

The present writer once sought to give ocular demonstration of the harmlessness of a blind worm by picking one up and allowing it to wind round his wrist and touch his face with its soft tongue; but the old village dame who shudderingly witnessed the performance was not to be convinced: "It be well known," she said, "that some folks even blind worms won't sting." As to trying for herself whether she was one of these favoured individuals, her mind recoiled from the idea. It was a clean flying in the face of Providence to handle a beast so notoriously dangerous!

The blind worm is one of the earliest of our British reptiles to emerge from its winter retreat, and a sunny day in the beginning of March is almost sure to tempt it out, and it may be seen, basking luxuriously on the slope of a sheltered bank, about the time that the first violet appears. The best place to search for the creature, at all seasons of the year, is an old disused stone quarry. Here, by turning over the larger stones, you are almost sure to come upon one or more blind worms lying coiled up beneath them, and sometimes a whole family may be found of different sizes and ages. It is well to exercise some caution, however, in disturbing these large stones that have for long lain embedded in the grass, for sometimes, instead of the smooth brownish-grey body of a blind worm, the boldly-marked folds of an adder may be discovered; and an adder, disturbed in such an unceremonious manner by his house being unroofed, is apt to be a little ruffled in his temper and prompt to retaliate upon the intruder.



TWO'S COMPANY: THREE'S NONE.

Just at dusk is the blind worm's feeding time, and his favourite diet consists of small grey meadow slugs, though a nice juicy earth worm is not despised on occasions. Possibly small beetles and other insect food are at times devoured; but as far as the experience of the present writer goes, slugs are what the blind worm principally lives upon, and for that reason it is most beneficial to the gardener and the agriculturist. The blind worm's method of seizing its prey is curious, and accurately described in Bell's "History of British Reptiles." Bending its head, almost at right angles to its body, above the doomed slug, it grips it suddenly in the middle, shakes it just as a terrier does a rat, and disposes of it, usually head first. All its motions while feeding are slow and deliberate, and it will sometimes wait for some time, with a slug held firmly in its mouth, blowing small bubbles of slime, before its victim finally disappears. In colour, blind worms are rather variable, some being of a much richer brown than others,

and some almost of the grey tint of an old piece of lead piping. They usually have some dark spots about the sides of the neck, but are never marked in any distinct pattern.

Several times in the year the blind worm sloughs, or changes its skin; but the old covering is not taken off in one continuous piece like that of a snake, but is shed in fragments, after the fashion of a lizard, the skin of the tail coming off last. Gentle and inoffensive in all its habits, a blind worm scarcely ever attempts to bite on being handled, and when it does so, its teeth are not strong enough to puncture the skin, though it retains its hold with remarkable tenacity, and will swing in the air without letting go. The average measurement of a full-grown blind worm seems to be about a foot, though specimens are sometimes met with that have reached a length of seventeen or eighteen inches. These are usually males, which are longer and more slender than those of the female sex, and have considerably more elongated tails. September and October are the months when the young blind worms are usually born, and at that time of year the females may often be seen lying with their bodies flattened out, to take full advantage of the heat of the sun. Like adders, blind worms are *ovo-viviparous*—that is to say, the eggs are retained in the body until the embryos are fully developed; and at birth the membrane enclosing the young is burst, so that they actually enter the world alive. Prettier objects than young blind worms can hardly be conceived. At birth they measure three and a half inches in length, and begin to feed at once upon small slugs. The number of young produced at a time is from nine to twelve, the latter being a frequent number. They are very slender and supple, and in colour like short lengths of the brightest copper wire, the underside being jet black. At the top of the head is a black spot, and from it a narrow line of black extends down the middle of the back to the tip of the tail. This colouring gradually grows fainter with age, and disappears when the young are about a year old.

A FAMILY GROUP.

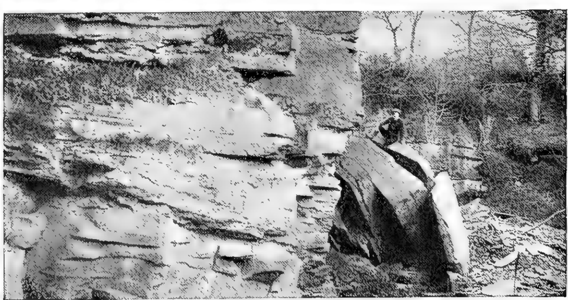
Baby blind worms have many enemies and few friends, and have need of all their agility and power of concealment. Adders are very fond of them, and probably, in some parts of the country, make them their staple diet. A curious illustration of this may be seen in Dr. Leighton's "History of British Serpents," where a photograph is displayed showing a large adder killed while in the very act of eating a young blind worm, the tail of which protrudes from its mouth. Pheasants are also said to devour them, and the old blind worms themselves may, with justice, be suspected of cannibalistic tendencies.

The blind worm has earned its scientific name of *Anguis fragilis* by a curious habit. When struck with a stick, or even roughly and suddenly handled, its tail

snaps completely off, and, what is more curious still, the severed fragment remains twisting and wriggling about in the grass for quite ten minutes after the fracture. It has been suggested that this habit serves as a protection, the blind worm itself escaping while the attention of the assailant is taken up by the strange movements of the tail; but this appears rather a doubtful explanation of the phenomenon. The creature, anyhow, is not injured by the operation, for the wound soon heals, and in the course of a few months another tail is produced. The true explanation seems to be that the blind worm, on being unexpectedly handled, becomes perfectly rigid with fear, and in that condition is easily broken, for the muscles that connect the vertebræ of the tail are very loosely attached, being arranged in four groups of two on each vertebra, so that, when the body is suddenly stiffened, they contract and the joint snaps.

No one would guess that so humble a creature as the blind worm could be the cause of a really important scientific discovery, and yet such is the case. There exists in the human brain a small organ, about the size of a hazel nut, which, from being something the shape of a fir-cone, is known as the pineal gland. Until quite recent times the purpose of this organ was a complete mystery, no more reasonable solution of the difficulty having been suggested than that of Descartes, who said that it was perhaps the seat of the soul. A German named Ahlborn, however, in the year 1884, pointed out that a similar gland was to be found in the head of a blind worm, and suggested that it was a rudimentary eye. The suggestion thus given was followed out, and another German, of the name of De Graaf, reached a still more curious conclusion. The eyes of vertebrate and invertebrate creatures are formed on quite different principles, and the strange discovery was made that the pineal gland is really a rudimentary eye of the invertebrate type. So the blind worm, so far from being blind, possesses two lateral eyes, formed on the vertebrate principle, and one eye in the centre of its forehead which is not, indeed, in a functional condition, but is of totally different structure from the others, being like those seen in invertebrate creatures. The discovery is very interesting as bearing upon theories of the progress and development of species, for though the pineal eye is not of practical use to any known creature, it was undoubtedly so in the case of the fossil *Labyrintho-donts*, the skulls of which have a well-marked orifice for the passage of the pineal nerve. Thus the hated and despised blind worm has won its way to a niche in the Temple of Science.

There are few parts of the country in which blind worms do not occur more or less numerously, so that those who are interested in Natural History have plenty of opportunities of observing their habits. With observation will come knowledge, and it is to be hoped that by degrees ignorance may be dispelled and this harmless and useful little creature be spared the foolish persecution to which it is now subjected.



THE BLIND WORM'S FAVOURITE HAUNT.

PUNCTATED AGOUTIS.

UNCOMMON PETS.

A series of articles on the Care and Keep of Animals in Captivity.

By P. WELLINGTON FARMBOROUGH, F.Z.S., F.E.S., etc.

V. THE AGOUTI.

AN animal seldom seen in captivity in this country, and yet one that has many things to commend it to the pet-keeper, is the Agouti—a South and Central American mammal. Agoutis are rodents of the family *Dasyproctidæ*, and are found in very considerable numbers in the forests of the central countries of South America, viz., Brazil, parts of Guiana, and Peru, and in lesser numbers in Paraguay and Central America. There is even one species found in the West Indies. There are several species, all of which, however, are very similar, and the remarks which apply to one species apply equally well to the other kinds. Agoutis are not very large animals, being only about twenty inches in length when fully grown, and in coloration are chiefly of varying shades of orange-brown, gradually lightening to a yellowish-white tint on the under-parts.

When in a state of freedom they are essentially forest-loving animals, and their food consists principally of a vegetarian or fruitarian diet; in cultivated districts they often do considerable damage to the growing crops of sugar cane, and, as a necessary consequence, are much persecuted by the landowners, who hunt them down and, if possible, drive them by constant persecution right away from the district. The common name for these animals in Brazil is *Cutias*. In habits they are nocturnal, and seldom make their appearance during the daytime, and this makes any attempt at their repression a rather hard task. To assist in the keeping down of these creatures, the owners of plantain and sugar-cane estates encourage the ocelots and other wild cats and the Brazilian wolf to remain in the neighbourhood, these being the common nocturnal foes of the agoutis. In addition to the estate owners and their natural foes, the natives persecute them and hunt them down for food, their flesh being esteemed a great delicacy by the Indians common to the Amazon basin, who

go in pairs to hunt them down, assisted by dogs. One man takes the dogs and beats the forest through in the neighbourhood of the river, where the other man has stationed himself in a boat. On being pursued by the dogs the agoutis take to the river—being excellent swimmers, although unable to dive—where they fall an easy prey to the man in the boat, either by being killed for food or captured alive and sold for a few pesetas to some purchaser who wants one as a pet, many people in Brazil keeping one or two agoutis roaming at large in the *patio* of the house.

In this country, however, it is not advisable to allow them such liberty, as, if killed by a dog, they cannot be replaced at the expenditure of a few coppers; so a cage is a necessity. This must be fairly large, say not less than four feet in length by three in height and width. Galvanized wire netting can be used, but is not recommended, quarter-inch rod iron being far preferable owing to its extra strength. All the projecting edges and corners of wood should be zinc-covered, as the agouti is very fond of trying the edges of its teeth on any convenient piece of wood; and if ever set at liberty for a short time to run about the room a very watchful eye must be kept upon it, as it is particularly liable to use its teeth upon chair legs, mouldings of doors, and any carved work on sideboards or bookcases, usually selecting the most expensive and valuable articles of furniture for the purpose. This habit of gnawing must not be entirely checked, as it is the natural means of keeping the chisel-edged incisor-teeth in proper condition, and therefore some wood—a small piece of a tree-branch a couple of feet long and two or three inches in diameter—must be provided for the purpose of the agouti exercising its teeth on, which otherwise would grow to an abnormal length, becoming at last an actual deformity.

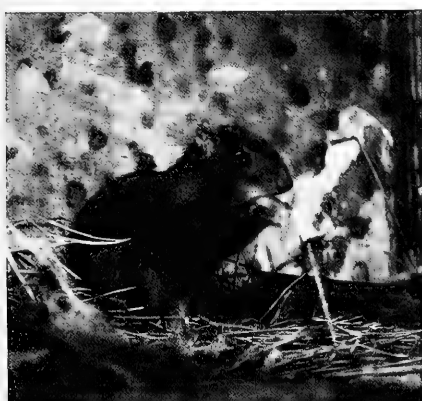
AGOUTI.

The food vessels are best of strong earthenware; they are better than the heavy metal ones, as, although the latter are less likely to be overturned and broken, they are very liable to get rusty and unsightly, and are not very easy to keep clean. The earthenware ones, on the other hand, simply want dipping in hot water and then wiping dry with a towel to be perfectly clean and wholesome again. Nuts, greens, and fruit—such as apples and bananas—carrots, and puppy biscuits form the principal items in their dietary; and the agouti usually sits up with its food in its forepaws, eating after the manner of a squirrel, as is represented in one of the illustrations, that particular agouti—the West Indian species—being one of His Majesty's, King Edward the Seventh.

It is rather curious that agoutis, although gregarious in their native haunts, are very unsociable animals in captivity, preferring to be alone in a cage and resenting the introduction of a companion to a marked degree. If one be introduced—except a female at a proper season—a vigorous combat is soon in progress, and usually

results in one animal or the other being rendered quite *hors de combat* owing to the severe teeth wounds they are able to inflict on each other with their powerful incisors. Possibly a larger cage might alter this trait of these animals.

Agoutis breed freely in captivity, but the sexes must only be paired at the proper times—either May or June, or October. When the female is observed to be gravid, a retiring-box must be provided in the cage so that she may hide herself from inquisitive eyes. A doe rabbit is not more jealous of her young than the female agouti, and any attempt on the owner's part to see how many (if any) young there may be is but the prelude to their destruction by the dam. At this time the cleansing operation must be performed as little as possible, consistent with keeping their cage fairly clean. If a large bundle of sweet hay and straw be piled up in front of and around the retiring-box so that the mother cannot be seen when inside, and the necessary cleansing be performed as quietly as possible, not much notice will be taken; but the scraper must be very lightly used, so as not to make a noise and disturb the dam, who in such a case would soon commence a meal off her young ones. The females are splendid mothers, and are most assiduous in their care and attention for their young, and do not allow the male to approach the litter until nearly a fortnight has elapsed since the birth.



WEST INDIAN AGOUTI.

A very suitable covering for the floor of the cage at ordinary times is an inch or two of clean gravelly sand, on which is placed a layer of clean sweet straw. Agoutis have a habit of hiding their food under this and then stamping over it with their hind legs to make sure it is properly hidden. They are rather nervous animals, and should a dog approach their cage they make terrified attempts to escape, dashing violently round the cage, knocking themselves against the walls and wires in their frantic attempts to get away. They are naturally very quick in their movements, and resemble a small deer when running.

WEST INDIAN AGOUTI.

It has already been mentioned that the Indians hunt these animals for culinary purposes. The flesh is white, and, according to those who have tasted it, good flavoured, they describing it as resembling that of the hare or rabbit. There is no reason why it should not be so, as agoutis are remarkably clean animals, and spend a considerable amount of time in cleaning themselves—particularly their lips and faces after each meal with their forepaws. Agoutis may be obtained from the larger animal dealers at prices varying from thirty shillings to two pounds each.

THE BORDERS OF INSTINCT AND REASON.

By C. J. Cornish, M.A., F.Z.S.

CONSIDERING the want of variety in the acts which make up the daily life of most animals, the development of the reasoning faculty in most of them is high, and must be deemed ample considering the disadvantages under which they are placed by the lack of speech. Their capacity for developing and improving their reasoning powers is also very considerable. The difference between a horse and a pony has often been said to consist not so much in size of body, but of brain. It is generally said that most ponies are clever, and most horses the reverse, though the inference is scarcely fair to the larger animal. When allowed to use their brains horses are clever enough; but they are generally shut up in stables, artificially fed, warmed, and sometimes clothed, and the object of their training is to make them as much like machines as possible. If a horse even dares to *look* at an object which he does not understand as he passes, he gets his head checked in the opposite direction, and a rating or cut of the whip. The consequence is that his whole reasoning faculty is concentrated to one end—a blind obedience. Many jokes were made about the omnibus horses sent out to the war for the use of the artillery. It was said that they needed a bell or a whistle to start them. It was true in a sense; but they were so obedient that they would take the guns forward or fetch them away when shells were bursting all round them, and after rifle bullets actually wounded them. Our clever ponies are the result of centuries of hard fare and poor living. They have for generations shifted for themselves, and the most sensible naturally survived. When used either for riding, or in harness, they are generally much more in the company of men, or running loose in the fields and being ridden by all and sundry; and the result is a much more highly-developed power of reasoning in the Basuto or Boer pony than in the English carriage horse.

But the degrees of cleverness in animals of the same species is remarkable. The brightness and quickness of some dogs are as different from the stupidity of others as is the effortless attainment of accomplishments in the best specimens of boys or girls compared with the lumpish stupidity of others. The writer has, on a very few occasions, come across these brilliantly clever dogs, quite as often of the female as of the male sex. They not only learn anything that it may be wished to teach them; they improvise to meet difficulties, and, what is more, they make mistakes of the kind which some naturally quick-minded aboriginal might make who was being domesticated

by Europeans. Their acts need no fanciful interpretation. Thus, a very clever setter bitch, when about to be taken out for a walk, was given a piece of biscuit. She did not want it, but at the same time did not wish to be rude. She instantly put it down on the mat by her master's foot, pushed it up to his boot with her nose, and with her paw *pulled the foot towards it.* This meant, "I don't want the biscuit now, thanks; but put something over it, and keep it for me till I come back." The pull at the foot was just as a dumb person might take another's hand and lay it over something, as an inducement to take care of the object.

On the other hand, one of the stupidest and most helpless failures in dog-life ever seen, a dog for whom everyone was sorry, because he was so entirely unable to take care of himself, was absolutely first-class when he dropped his imperfect reason and relied entirely on instinct for pointing and finding game.

When in the shooting-field his "nose" was extraordinary, and he would wind partridges at a great distance and point them as steadily as could be wanted, also quartering the ground (an inherited gift more or less) in a very finished way, though he had never been taught to do so. Yet he always spoiled the effect by some outrage against the laws of the field, which he could never be taught to understand or respect.

Animal intelligence, though not necessarily higher in degree when they are acting as our servants and not for their own ends, is then very much more easily appreciated and understood by us. Consequently its exhibition in such employment is worth careful consideration. Taking game by setting or pointing, or by the much less well-known work of the decoy dog, has been one of the forms in which canine intellect has been longest employed. There is an old picture, painted in the early sixteenth century, of the Garden of Eden, in which a pointer is "standing" a brace of partridges! The "point" is a curious example of an action in which instinct and reason meet. The stopping of the dog, however it began, has by training and heredity become instinctive. The dog, even when quite a puppy, stops when it smells the game, and remains almost paralysed, its impulse to rush in and seize it being checked by a strong instinct to stand still, during which it derives an actual physical enjoyment from the scent of the game—at least, a modern scientific authority tells us so. Yet the dog, after he has accompanied his master and had game shot over him, is quite aware that he is a half-controlled "medium," and, while still under the dominating "pointing" instinct, will look round imploringly to his master to urge him to hurry up if the scent tells him that the birds are moving.

A border-line action of a different kind is the squatting instinct of young birds. It is a perfectly reasonable precaution. Keeping still and lying low are not characteristics peculiar only to Brer Rabbit; but it is most remarkable to see the way in which tiny peewits, or little teal, hardly bigger than a fluffy humble-bee, lie down, put their little chins flat on the ground, and remain motionless for minutes to avoid being seen.

Examples of what may be called assisted instinct, or instinctive actions in which reason comes in to aid in doing what instinct partly accomplishes, are not numerous. These border-line sets of action are also most suggestive of the nature of what we call instinct. It seems as if some animals had two selves, the instinctive or automatic self, and the reasoning, free-will acting self, and that in the latter capacity they were able to survey their instinctive self, and calculating from what instinct would do, go a step further and improve on the act by reason. The example of the pointer dog, who points almost automatically and by instinct, but "breaks" the point, or hints the time at which his master ought to take advantage of his instinctive act, by the aid of canine reason, is perhaps the best example. But if we take the inherited and instinctive act of squatting to avoid being seen, which very many animals do,

we shall find that reason improves on this. A very young plover or teal will squat until it is picked up. Later it will only do so until reason tells it that it is seen, when it instantly stops the instinctive act, and acts according to the suggestions of reason. Half-grown leverets will squat till you pick them up. Not so, as a rule, the full-grown hare. Instinctive actions among birds are perhaps less common than is believed; or rather, what appear to be instinctive actions are in some cases due to a change of physical condition.

Incubation, a very trying process, one would imagine, to such active creatures as birds, is no doubt the result of instinct. But very soon it proceeds, not from an instinctive impulse, but as the result of a peculiar physical state, almost like the results of coma, or of the administration of ether, or alcohol, or anything else which for the time alters the working of mind and body. When a hen becomes "broody" she very soon is quite insane about everything else, and can be handled and picked up; neither will she cease to sit, even though the eggs are taken from her. This is perhaps the closest instance among higher animals of an approach to the *automatic* instinct of insects. But it takes a little time before the hen passes into this state, which is, moreover, probably more strongly marked in the fowl and game birds than in some others. A hen partridge, if disturbed during the first twenty-four hours in which she is sitting, will often desert. She is not yet thoroughly "broody." But three days later, if put off her eggs she will often cluck about close by like a broody hen.

A swan, though it has the instinct to sit, never loses her sense as does a fowl, but actively aids her instinct by reasonable actions. While on the nest she stretches round her long neck, and all day long and every day keeps adding to the nest any material she can reach.

She also carefully turns her eggs once or twice a day with her bill; yet her reasoning powers are curiously limited. She will do all this, and carry her young on her back on the water; yet if a cygnet fall out of the nest during the first day of hatching, it never occurs to her to pick it up and put it under her.

Nest-building by birds is a border-line action. They inherit the instinct to build, and the knowledge of one or more particular classes of design. Yet the site, material, and workmanship are very largely matters of reason and choice. What guides birds when migrating, and the sources of their remembrance of places, still remain absolutely unknown to us. Among the higher mammals these acts appear as manifestations of something excelling instinct; yet it may prove that they are border-line actions also, in which the mind of birds, which is highly developed, uses instinct as material, and so forms conclusions of which we can only see the astonishing results.

In the case of the beaver, which constructs an elaborate engineering device in the form of the dam, which keeps the water opposite its burrow or "lodge" at a uniform depth, every act, from the cutting down of trees to the formation of the dam on proper principles of construction, is done by a reasoning process of a very high order. Yet we must assume that all these processes of reason are subsidiary to a "fixed idea," implanted entirely by instinct, that it *must make a dam*, a notion which is ready-made in the brain of every beaver which is born.

Can we at all detect the nature of the dividing line between the instinctive and the rational by our own experience? The answer is, probably not. By the fact that we are the most rational creatures, we are also the least instinctive; and what little primary instinct we had is improved away. We have not enough of it left for us to try experiments with. We cannot trace the survival of instinctive or automatic acts even in primitive races, for the more closely they are examined the less instinctive do they appear. Even the well-known power of savages to find their way turns out to

be due really to observation, though it is only half-conscious observation. In conclusion, we may say with some confidence that the sets of actions governed by both reason and instinct—in animals which think by the use of brains and not by the action of ganglions, or whatever the right term may be for the nerve centres of the lower creatures—are just as rational as purely reasonable acts done by the use of will only; for in them the automatic impulse of instinct is made use of consciously by the animal, just in the same way that it uses its sense of touch, or sight, or its muscles, to achieve whatever its end may be. The contribution of instinct is merely passive, for, when it consists of an impulse to perform certain acts, it is guided by reason just as the motions of the birds are. In other words, in the higher animals instinct detached from reason is almost entirely useless to their existence and survival.

ANIMAL ANECDOTES.

Some instances of instinct and intelligence in animals.

A Collie's Cleverness.

We have received the following two anecdotes from correspondents. They may fitly be inserted here. A photograph of the collie which is the centre of the first story is reproduced on page 344: "A lady living nearly three miles from a town had a collie which, as it had hurt one of its legs, she took to a veterinary surgeon the *other* side of the town. There the dog was retained for a couple of days, and was well looked after and the leg cured. Some six weeks had passed when the lady noticed her collie looking very sick and ill. The sickness continuing for three days she was thinking of driving him to the veterinary surgeon again, but on going to look for him in the morning about twelve o'clock she found he had disappeared, turning up, however, looking quite well just before dark. A friend in the village afterwards told her that he had seen the dog strolling along the road in the morning towards the town. She heard afterwards from the veterinary surgeon's servant that the dog had been at *their* gate in the morning waiting to be let in for over an hour and a half. He waited so patiently and looked so ill that the vet., recognising his former patient, took him in, gave him a dose of medicine, and let him out to stroll home as he liked. The collie had only been to that side of the town once before in his life, that being when he was driven with his bad leg, more than six weeks previously, to see the veterinary surgeon. The vet. thought this such a curious instance of cleverness and memory that he refused to take any fee for his treatment."

A Horse's Revenge.

"A groom, a man of uncertain temper, had charge, amongst others, of a large chestnut horse. The horse had on several occasions to put up with brutal illtreatment from the man, all of which it bore without a murmur, until one day, when the man was riding it down to the pond to water, instead of standing at the edge with only its forefeet in the water, as was its usual custom, it walked straight in to the depth of about three feet, and, after drinking, deliberately pitched the fellow from off its back, and then, letting him struggle for a few moments, caught hold of his clothes with its teeth and dragged him out again, a sadder but a wiser man, to the great amusement of a farmhand who had been an interested spectator of the whole thing. This was the more remarkable as, upon other occasions, it was impossible to make the animal enter the water to any depth, although attempts had been made to do so."

Foxcraft.

Few animals are more wily than the fox. No other hunter can travel as quietly as Reynard; and although he cannot beat a rabbit in a fair chase, he manages to make many a square meal off bunny by means of slipping from bush to bush, crawling and creeping for all the world like a man stalking a deer.

At no other time does the fox display his cunning so well as when running for dear life with a pack of hounds on his trail. A well-known sportsman relates that he once saw a tired fox, chased by a pack of hounds, make straight for a flock of sheep in a pen, run through them, and ultimately escape. Another fox, close pressed by the hounds, leaped from back to back of a herd of goats. The dogs were unable to follow, and Reynard escaped. A trick often resorted to by foxes when closely pursued is to leap as high as possible, grasping the branch of a tree with their teeth, jump up, and remain in hiding until the hunters have passed.

A Very Clever Fox.

A gentleman, while hunting near a river one winter's day, saw a fox run out on the ice and make at full speed for an opening in the ice where the rushing water of the river could be plainly seen from the bank. At the edge he stopped, turned, followed his tracks back to the bank and then ran for some distance down the stream and sat there. Soon a dog came crashing out of the woods, baying finely, hot on the fox's trail. Now dogs, when on a chase of this kind, trust almost entirely to their noses. This one was no exception. He ran along the ice, head down, and when he reached the hole he could not stop, but plunged into the water and disappeared for ever. Then the fox trotted away with every sign of satisfaction.

"When he reached the hole he could not stop, but plunged into the water and disappeared for ever."

Ingenuity.

Some swallows who had a nest which opened in front were persistently annoyed by attacks from sparrows. Instead of closing up their front door and making a side entrance, they resorted to strategy. Whenever the sparrows thought to take them unawares, they always found one of the parents keeping guard—at least so it seemed, for, come whenever they might, the sparrows found one of the swallows' tails sticking out of the hole. When the swallows migrated the mystery was solved. The tail was really nothing but three feathers, so ingeniously laced that they quite deceived not only the sparrows but human beings as well.

The Brain of a Horse.

Dr. Roubet, a French doctor of some repute and a great lover of horses, wishing to ascertain to what degree the intelligence of a horse was capable of development, by dint of much patience expended on his favourite horse "Germinal," has arrived at some remarkable results. If a chair is

thrown over, "Germinal" has been taught to pick it up and place it in a vertical position. He opens a desk with his mouth, takes out a handkerchief and offers it to his master, and then, rearing on his hind legs, he shuts the lid of the desk by a well-directed kick. He sits at table with his master, begs like a dog, blows out a candle, opens a door with his foot and shuts it again, and can even trace letters on the black-board. Dr. Roubet's method is one of suggestion, in which he avoids all violent means and strives, on the contrary, to raise the intellectual level of the animal. He depends for his results on the animal's intelligence, on its initiative, and on its memory, and he maintains that, apart from the faculty of speech, the brain of a horse is about equal in capacity to that of a dull, backward child.

"They collect on the banks and make a terrific noise by barking and yelping as loudly as they can."

Wits and Pace versus Jaws and Teeth.

IN Central Borneo, when dogs wish to cross a river they have considerable difficulty in doing so owing to the fact that crocodiles find them very toothsome morsels. They therefore collect on the bank and make a terrific noise by barking and yelping as loudly as they can. The crocodiles are attracted to the spot by the noise, and the dogs, as soon as they see that their bait is successful, set off up the bank at top speed and cross higher up. A Borneo traveller states that he has watched this manœuvre times without number.

Sagacity in Snails.

M. CAMILLE SPIESS, in the "Revue Scientifique," proves that snails not only have intelligence, but also recognise social duties. It appears that a Swiss snail-breeder of L'Isle, in the canton of Vaud, kept 50,000 snails in an enclosure surrounded by a wall some 8 feet high, and surmounted by a chevaux-de-frise of small spikes so arranged as to check the escape of the snails by pricking their foot and forcing a retreat. But the snails escaped in spite of such precautions, and careful observation revealed that the manner of their escape was to join their forces and make a bridge of shells, whereby, one at a time, their fellows could get over the forbidding spikes with impunity. How this was contrived: whether there was a self-sacrificing snail that stayed behind; or whether the top of the wall was a favourite basking-place and some of the snails were quick to take advantage of the situation and climb out over the backs of their fellows—these are matters which the spectators could not, of course, decide.

Do Dogs Reason?

A DOG was lying on a chair in the kitchen when something without attracted his attention, so he got up to see what it was. The window, however, was covered with steam, so that he was unable to see through it; he therefore licked the glass and made a suitable peep-hole. This he did so deliberately, and so evidently with purpose, that there can be little doubt that mental action preceded the physical.

Very Painful Angling.

"There is in Java," said a traveller, "a species of large ape, one peculiarity of which is that it nearly always has a scarred tail. The explanation is that these apes fish for crabs, using their tails for fishing-lines. They are so passionately fond of crab-meat that they are willing to endure a good deal of pain to catch the crabs, which they cannot capture in any other way. To see the monkey fishing is a comical sight. He thrusts his tail (which is long and powerful) into one of the sea-water pools where the crabs lurk, and remains perfectly still, wearing an anxious look. In a few moments you see him clench his teeth, the tears come into his eyes, and it seems to be all he can do to refrain from uttering an agonised howl. When the crab has taken a firm grip, the monkey makes a mighty sweep with his tail, and the crab is jerked out and brought down with a bang that smashes its shell like an egg. Then the fisher has his reward. He picks out the meat daintily and devours it, pausing now and again to utter a groan and to lick his injured tail, which is often badly lacerated."

The Snipe as a Surgeon.

Some interesting observations concerning the surgical treatment of wounds by birds have been made by a Swiss naturalist. The most interesting example was that of a snipe, both of whose legs he had unfortunately broken by a misdirected shot. He only recovered it on the following day, when he found that the poor bird had contrived to apply dressings of down from other parts of its body, fastened by congealed blood, and a sort of splint of interwoven feathers to both limbs.

Another Case.

In a case recorded by another naturalist, a snipe which was observed to fly away with a broken leg was subsequently found to have forced the fragments into a parallel position, the upper fragment reaching to the leg-joint; and they were secured there by means of a strong band of feathers and moss intermingled.

A Clever Idea.

A collie, having been annoyed by a neighbour's dog who was in the habit of digging up his buried treasures, hit upon the following method of frustrating the thief. One day, after dinner, his master saw him digging a hole unusually deep, and in it he put a large and highly desirable bone. Then he covered it well with earth, disappeared for a few minutes, and came back with a smaller one. This he carefully laid on the earth which concealed the big one, and then covered it up. Next morning the thief arrived, dug up the worthless bone, and ran off with it; later in the day "Don" came down leisurely, and reaped his reward as he sat comfortably crunching the large juicy bone.

THE LESSER BLACK-BACKED GULL.

This Gull, whose portrait is reproduced in our frontispiece, is one of our most prolific British birds, and one of the best known; but it is not by any means the most popular—at all events with a good many people. This, perhaps, is to be accounted for by its omnivorous habits; it does not confine its search for food to the ocean, but visits cornfields and moorlands too with a view to extracting grain and game. The lesser black-backed gull, in addition to the superlatives already enumerated, can also lay claim to be one of the longest-lived of British birds, the years of its life averaging *probably* a hundred, more or less. Nor can the bird be very popular among its own people if the following incident, witnessed by Mr. Oliver Pike, is of frequent occurrence:—"While photographing a group of these gulls," he writes in "Hillside, Rock and Dale," "I saw one approach a nest belonging to a neighbour gull and peck a great hole in the side of one of the eggs and swallow the contents. All three eggs were quickly devoured, and then the thief walked away, looking quite satisfied and chuckling in a contented kind of way."

Photograph by W. P. Dando, F.Z.S., Regents Park.

THE GLUTTON: ONE OF THE SCARCEST ANIMALS IN CAPTIVITY.

By W. P. Dando, F.Z.S.

MANY persons when passing the raccoons' cages in our Zoological Gardens, in the centre one of which is housed the Glutton (*Gulo luscus*), or, as it is called in America, Wolverene or Carcajou, are neglecting to observe one of the scarcest animals now to be seen in captivity. The legendary tales of Ysbrandt, Claus, Magnus, Buffon, and many others in regard to the gluttonous habits of this animal should alone make the specimen at the Zoo attractive. The octogenarian naturalist, Mr. John Watts de Peyster, of "Rose Hill," New York, who commissioned me to photograph this unique specimen, writes as follows:—"You would be astonished at the labour and expense I have lavished, in gathering and reproducing information respecting these animals. I am astonished at the ferocity of your specimen, because I have read in several works that the carcajou becomes gentle and responsive to kindness, even affectionate, and learns to moderate his gluttonous appetite in captivity. Through the kindness and courtesy of different officials of the principal museums of the world, I have obtained photographs of the wolverene, or carcajou or glutton, taken from stuffed specimens; but the photographs you kindly send me are unique, as your institution contains the only living specimen, of which I have been able to learn, in any institution in America or on the continent of Europe."

The depth of the cage from back to front is so shallow, that, unless the animal is right against the farthest wall, a good photograph is impossible. I was two days getting the results shown, as the animal got into a most violent rage, foaming at the mouth at sight of the camera, and continued his violent movements and antics for hours together every time I approached the cage, until, overcome by exhaustion, he flung himself down for a second in the positions shown, rewarding me for my patience with two representative poses.

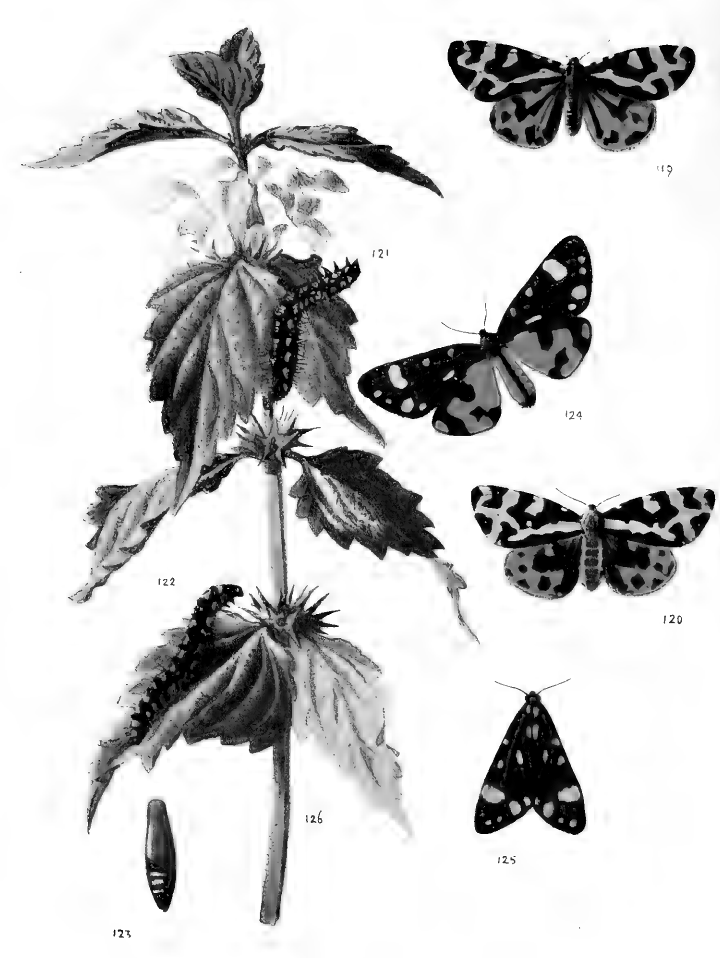
By far the best account I have been able to find of the habits of the glutton, which holds the unique position of being the only representative of the genus to which it belongs, is that by Sir John Richardson, who says: "The wolverene is a carnivorous animal, which feeds principally upon the carcases of beasts that have been

killed by accident. It has great strength, and annoys the natives by destroying their hoards of provisions and demolishing their marten traps. It is so suspicious that it will rarely enter a trap itself, but, beginning behind, scatters the logs of which it is built, and then carries off the bait. It feeds also on meadow-mice, marmots, and other rodentia, and occasionally on other disabled quadrupeds of a larger size. I have seen one chasing an American hare, which was at the same time harrassed by a snowy owl. It resembles the bear in its gait and is much abroad in the winter, and the track of its journey in a single night may be traced for miles."

Mr. Graham observes that "The wolverenes are extremely mischievous, and do more damage to the small fur trade than all the other rapacious animals conjointly. They will follow the marten-hunter's path round a line of traps extending forty, fifty, or sixty miles, and render the whole unserviceable, merely to come to the baits, which are generally the head of a partridge or a bit of dried venison. They are not fond of the martens themselves, but never fail of tearing them in pieces, or of burying them in the snow by the side of the path, at a considerable distance from the trap. So pertinacious, indeed, are these animals, in quest of slaughtered carcases, that they have been known to gnaw through a thick log of wood, and to dig a hole several feet deep in frozen ground, in order to gain access to the body of a deer concealed by hunters. Another very curious propensity of the glutton is its habit of stealing and carrying away to some distance articles which can be of no possible use to it, and an instance is recorded where these animals removed and concealed the whole paraphernalia of an unoccupied hunter's lodge, including such articles as guns, axes, knives, cooking-vessels, and blankets."

Photograph by W. P. Dando, F.Z.S., Regents Park.

GLUTTON RECLINING.



BRITISH TIGER MOTHS AND THEIR CATERPILLARS.

STALKING SEALS WITH A CAMERA.

Written and Illustrated with Photographs by C. V. A. Peel, F.Z.S.

HAPPILY for British seals their coats are of little or no commercial value. They are hair seals and belong to quite a different family from the sea-bears, which furnish the sealskin jackets.

Seals are comparatively scarce round the English coasts, their true home and breeding-grounds being situated on the west coasts and outer islands of Scotland.

No less than five seals visit our coasts; but by far the commonest are the Common Seal and the Grey Seal. The Ringed Seal is a rare visitor from the Norwegian fjords; the Harp Seal has occasionally been taken in the Thames and Severn, and the Hooded Seal is the rarest of all. No British seal has either external ears or under-fur.

The Grey Seal is a large animal, and breeds extensively in the Outer Hebrides. A fine specimen will measure between eight and nine feet, and weigh four hundred pounds. This species is easily distinguished from others by the formation of the relatively large cheek-teeth, which are composed of but a single cusp; and with the exception of the last one or two in the upper, and the last one in the lower jaw, the teeth are implanted in the jaws by means of only a single root each. The young are white or yellowish-white at birth, and remain so for upwards of a year, when they turn grey, marked with a number of blackish spots. Many specimens are silvery-white, with few traces of spots, whilst others are almost black. The grey seal is wilder and less intelligent than the common seal, and cannot be trained and taught to do tricks so easily as the smaller animal.

The Common Seal breeds in great numbers in the summer in the outer islands off the west coasts of Scotland. This species is of gregarious habits. One, or at most two, are produced at birth, the young being at first white. The average length of the adult is four and a half feet. The teeth of this species are smaller and more pointed. The colour of the skin of an adult is yellowish-grey, with blackish spots. These animals are very sagacious, and can be taught to do almost anything. Seals are extremely difficult to approach within camera shot, especially when there is a strong wind blowing or where they are frequently disturbed. But on a warm, calm day, in places where they are rarely disturbed, I have frequently crawled almost near enough to touch one. Stalking seals amongst rocky islands is an interesting and often highly

exciting sport; and when the harmless camera takes the place of the destroying rifle in the stalker's hand, a lasting record can be obtained of the attitudes and surroundings of these weird-looking creatures. Seals are in the habit of coming ashore on to the seaweed-covered rocks to rest at low tide. Unless disturbed, or the stock of fish in that particular bay becomes exhausted, they will frequent the same low-lying rocks every day for weeks and months. The seals choose isolated banks of rocks away from the mainland. The lee-side of islands is nearly always selected, not entirely because of the difficulty of landing on the windward side, but because the seals have to rely very greatly upon their sense of smell, which is as acute as that of a red deer, to protect themselves from approaching danger.

It is, of course, perfect madness to attempt to approach seals down wind, and it is frequently impossible to approach them right up wind, as the sea bars one's way. They must, in nearly every case, be approached on the side wind. It is most amusing work searching with a powerful glass for seals along the sea coast, especially when it

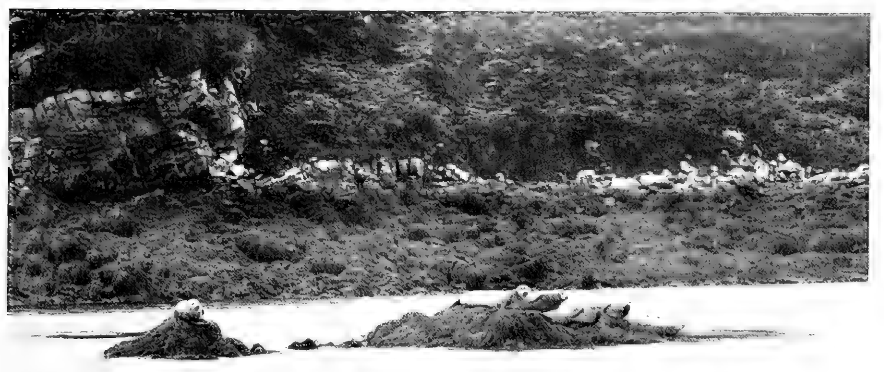
THE SEALING GROUND.

is low tide and the animals are all out of the water and lying at full length, like a lot of beer casks, on the seaweed-covered rocks; the seals look so like pieces of grey rock showing here and there amongst the seaweed.

But when the tide is just upon the ebb the seals may be plainly seen swimming about in the water and watching for their favourite rocks and resting-places to be uncovered by the tide.

But it is not of much use attempting to stalk them from the shore except when the tide is pretty well out and there is plenty of uncovered seaweed to crawl over. When a seal has, with difficulty, climbed upon a rock from out of the sea, he almost invariably turns completely round at once in order that he may, should occasion arise, be able to plunge into the sea head first. The lighter the breeze the more seals come ashore; but when a gale is blowing the few seals that one will see upon the rocks are extremely wary and difficult of approach.

ON THE SEAWEED.



ON THE ROCKS.

I remember having an amusing day with my camera stalking seals in the Outer Hebrides. It was a comparatively calm September morning, with plenty of light—an ideal day for stalking and photographing these wary animals. A five-mile walk from the shooting-lodge brought me to a series of narrow creeks full of low-lying rocks and innumerable little islands, many of which could be reached from the mainland at low tide. The tide was about half out when I reached the top of a hill overlooking the first of these creeks. I had with me a powerful deer-stalking telescope, and carried a half-plate camera fitted with a long extension for use with a long-distance lens. This apparatus can be got ready for immediate work in a much shorter space of time than a camera with a telephoto lens. The latter would, no doubt, give better results if it were less bulky and more practicable for stalking on uneven ground after wild animals. In the first creek I could see no signs of a seal, and as the tide still had a good way to go out before it turned, I sat down and ate my lunch.

There is always to me a certain charm in being absolutely alone in a wild country, far from the haunts of men, far from the noise and bustle of cities and the constant wear and tear of life. The ever-present beauty and magnificence of mountain, moor, and river makes one think more deeply that there must be a Maker, that there must be a God.

In a town it is different. One sees nothing but the works of man—houses made by man, bridges made by man, money made by man. The wonderful creations of God, to my mind, can only be seen and properly appreciated in the country, far away from man and his work.

Luncheon over, I again scanned the rocks, which were now beginning to stand out in the sea, but, finding nothing, I snapped up the glass and crossed another mile of broken moorland. In the second creek there were more islands, and with the naked eye I at once discerned some grey-looking objects in the seaweed. Out came the glass, and, sure enough, they were found to be seals. But the question was how to get near them. From the land it was impossible, as the wind blew straight from it to their powerful noses, and there was too much water to think of attempting to get near them on the side wind.

I was sitting down considering what I should do, when all at once my eye lit upon a colony of seals some few hundred yards to the left of the first lot. They were lying on some seaweed close under the mainland. But in order to get at them I saw that I should have to descend a pretty formidable precipice to begin the stalk with. However, nothing venture nothing have, so I got up and walked over to the place to have a look at it. It was very steep and rocky, but not so bad as it looked. With my camera slung on my back I got down without any very great difficulty; but on reaching the bottom I found I was confronted with a second problem. I had to face a steep rock jutting out into the sea. However, I got round this at last without getting

A HAPPY COUPLE.

wet higher than the knee. My next discovery was that I could proceed no further in that direction without giving the seals my wind, so was obliged to retrace my steps, mount a small precipice, and have another look round to determine upon a different plan of action. I saw at once that by letting myself slowly down a steep heather-bank I could drop right out of sight of the seals, and then I should have merely to walk across some seaweed and cautiously push my head over some rock, when I judged I should be some thirty yards from the animals. The only objection to this plan was that when sliding down the bank I should be in full view of the seals. However, I determined to risk it, knowing well that if only I could slide down the bank slowly enough the seals, although they would see me, would not take much notice of me. I clutched the heather with both hands and began to descend. An old bull seal immediately put up his head and watched me intently. I tried to stop myself at once, but my grip of the heather loosened little by little; however, I went out of sight down the bank so slowly that the seal thought

BASKING.

nothing of it. Arrived at the bottom I was next obliged to wade through the sea until I reached a little island of rock. First I pushed my head, inch by inch, over the top of the rock until I could see that the seals were there. As luck would have it they had not moved. Cautiously I shoved my camera into position, an operation which took me several minutes. Every time the old seal moved his head I stopped pushing the camera forward. At last all was in readiness, and I pressed the button. Every seal jumped when the click of the shutter was heard. I could not help chuckling to myself as I quietly pulled back the camera an inch at a time to change the plate. I took two or three photographs, the animals starting and looking round every time they heard the shutter go. I became emboldened, and began to crawl over the rock towards them, pushing the camera on in front of me. At last I got within twenty yards, when I took a photograph. The old bull watched me all the while as I crawled still nearer. At last he became very uneasy, and kept looking down into the depths below him, as if meditating a plunge into the sea. I took still another photograph at about fifteen yards, but nearer I could not get. Whilst changing

the plate I got cramp in my left leg with being stretched on the ground for so long. I moved my leg too quickly. The seals saw me, and with loud splashes they dived into the sea and were gone. I got up to stretch myself, when I suddenly discovered that the tide was coming in very fast. I fairly raced over the rock and plunged into the sea to regain the opposite bank. I got deeper and deeper as I waded in, walking over the uncertain, slippery seaweed. The water in the middle of the channel had reached about to my armpits, and I was beginning to feel afraid I should be obliged to swim for it and so ruin all my work by wetting the camera, when I began to go up hill again and soon reached *terra firma*. I was over only just in time, for a minute after the stream through the channel became so strong that it must of necessity have taken me off my legs and perhaps, heavily weighted as I was with camera, glass, and shooting-coat, have drowned me. Still, to get so close to seals in their native haunts, and to watch them all unconscious of your near approach is worth some risk attending it, especially when one takes away with one, as a lasting trophy, a picture of the memorable scene.

The oil of these seals is much valued by the natives, who consider it more beneficial even than cod-liver oil for drinking purposes. The skins make excellent leggings or cartridge-bags; still, when one has shot a specimen or two for trophies, they may well be left in peace to add colour to and beautify the west coast scenery.

ON THE WEST COAST.

Fig. 1. Fig. 2.

THE LIFE HISTORY OF THE PINK ELEPHANT HAWK-MOTH.

Written and Illustrated with Photographs by FRED ENOCK, F.L.S., F.E.S.

WHEN the "improvements" (?) were commenced at Hampstead Heath, that once beautiful "happy hunting-ground" of many an old entomologist, most of the local celebrities of the British fauna and flora were compelled to depart from the home of their ancestors for more congenial ground, where the Bank Holiday crowds and noises would never reach them more.

Such emblems of Nature's marvels as the sun-dew and buck-bean soon began to fade when the one bit of bog-land was drained by "The Board," and, with the addition of cinder-paths and other "landscape gardening," even the Elephants, large and small, which thirty years ago could be stalked by a sharp-eyed entomologist, have also flown to fresh fields and pastures new, where they can feed in peace among the lady's bedstraw, without falling a prey to the feet of the madding crowd. Now those who desire to see the larva of the Pink Elephant Hawk-Moth must go out thirty miles or so from the Metropolis to some wild common in Surrey, where there is plenty of bog-land, covered with lady's bedstraw.

The pink elephant hawk-moth lays its eggs on the underside of the leaves, and being of a delicate green colour they are exceedingly difficult to detect. So are the young larvæ, which generally hatch out about the middle of July, and after the first moult rest along the main stem, making the most of their protective coloration and markings; the ground-colour up to the second moult is green, with seven lighter (almost white) diagonal stripes at the sides; the caudal horn is very short.

About July 21st the larvæ are an inch long—the fore-part beginning to assume the "trunk"-like form from which the moth takes its name. They have a voracious appetite, and when bedstraw is difficult to obtain the common willow herb is very acceptable to their palate. During the last week in July most of my larvæ were up for their final change of skin, which hitherto had been of a green colour. After a week's fast, resting on the main stem, muscular waves begin to surge through the entire length, starting at the tail, rolling along each segment, until the head is reached, which protrudes to almost bursting point; but it is not until these efforts have been repeated a number of times that they produce the desired effect, and the skin splits on the back of the head, which also splits, and, after more muscular surgings, is forced off, revealing a brand new covering of a delicate green. The skin on the second segment slowly splits, and so on to the third and fourth; the "new body" now begins to protrude, and the first pair of pro-legs are withdrawn from their old coverings. Very soft and delicate they are at first, but as they become exposed to the air they quickly assume darker colours, and the sharp "claws" harden, so enabling the larva to set them down and gently bring them into use. When once the feet are free and set down, then the old skin begins mysteriously to recede, shrivelling up into white folds as it is "sloughed" off towards the tail. Fig. 1 is a photograph of the living caterpillar in the very act of changing its skin; the old one is shown in a shrivelled white mass about half-way down the body of the larva—the head-skin not quite free.

Fig. 3.

Very sedately the larva walks forward *out* of its old skin, which, together with that of the caudal horn, passes over the new bent-down one, (Fig. 2.) Until just ten minutes after the time when the old skin first split, the larva has walked clean out, and now proceeds to use its swollen anal claspers as a hammer upon the old skin.

Three hours after, the elephant larva was satisfying its hunger after its long fast by eating up its cast-off clothes! This is the custom among all smooth-skinned larvæ. As soon as their fast has been broken, time is allowed for digestion, and then their appetite can scarcely be satisfied, and in a very short time a dozen pink elephants will make "bare poles" of as many sprays of willow herb. The crunch of their jaws can be heard most distinctly; and unless the food-plant be grown upon the premises, it is often a difficult matter to keep them supplied with fresh food, which is most essential to their welfare.

By August 4th most of the larvæ were full-grown and of great size—over three inches long and five-eighths of an inch in diameter; the colour a dull brown, almost black, minutely checkered, like a chessboard, from the fifth segment down to the side of the head, which, when protruded, gives the larva a decided elephant's-trunk-like appearance. At the sides of the fifth and sixth segments is a large, velvety, black eye-like marking with a violet crescent on the upper side; and when suddenly disturbed, the larva draws in its head and first three segments until they are level with the fifth, and the eye-like markings are then at the front margin, giving the larva a very startling appearance, which no doubt acts as a warning to birds and protection to the larvæ. When full fed the larvæ become very restless; and though they delight to feed in the

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

damp hollow they do not pupate there, but walk long distances to find a suitable place in which to spin their cocoon. Some of mine, which I kept in a large bell-glass, were walking round and round continuously for several days, until at last they adapted themselves to circumstances, and made their open network cocoons among the old stems of the bedstraw. The pupa is beautifully marked in the same manner as the larva (Fig. 3). All my larvæ had gone to pupa by August 7th, and remain waiting the return of July.

The first emerged July 3rd, almost before I was ready for it, though I had been watching it for some days; but it was too far advanced to attempt photographing it. My second pupa emerged during a short absence, and again I was disappointed; and though I watched the third for three days and had placed it in position for photographing, it seemed to take advantage of my absence for not more than three minutes—I had a look at it before I left my den—and on my return at 10 a.m. I

Fig. 8.

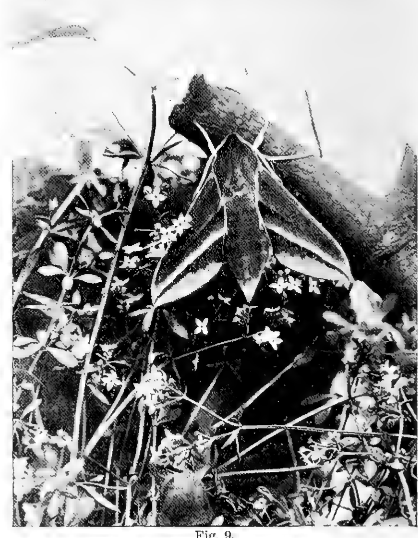


Fig. 9.

found the pupa empty and the elephant crawling up the curtain! To coax it on to my finger and then to its perch in a pot of peat (which had contained the pupa) and fix it in position did not take half a minute, and I had my first photo (Fig. 4), though *not* so early a stage as I intended. It quickly crawled up, and after a little restlessness placed itself in a favourable position for Fig. 5, in which the wings are beginning to curl, as is usual at this stage, ten minutes after emerging from the pupa.

Figs. 6 and 7 were taken at three minutes' interval, the under wings being almost fully developed; they always appear to take precedence.

At this time the elephant delighted in a number of wriggles and twistings, with the evident intention of exercising the muscles of its wings as it hung firmly by its claws. At 10.40 I took Fig. 8, when the wings were fully developed and only required to be flattened down. Eight minutes after this final movement took place (Fig. 9),

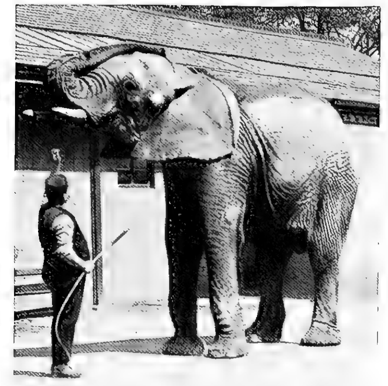
for at 10.50 I beheld the pink elephant, in all its beauty of perfection, "sitting" just as I had found the Small Elephant Hawk-Moth (much rarer species) at Westwood Coppice, Sutton Park, Warwickshire, in the sixties. The sight of either of these elephant hawk-moths sitting among the bedstraw is one never to be forgotten. No gay cavalier was ever more daintily clothed in a costume of pink, with the softest and best-fitting nankeen breeches, than our six-legged elephant. Every hair seemed to have been brushed, trimmed, and powdered with silver—not a scale or feather out of place. The wings are slightly raised, exposing the beautiful pink and sage-green body, while the finish of the noble head, with its many-jointed silvery antennæ springing out close to the large compound eyes, below which, enveloped on each side by long pink hairs, is the tongue or trunk (of course, an elephant *must* have one), over an inch long, the resemblance to that belonging to our late friend "Jingo" of the Zoo being most striking when seen in section; it has the same double tubular arrangements of tunnels similar to the Britannia Tubular Bridge. The whole length being composed of rings or circular ribs, gives great elasticity and power of rolling it up like a watchspring. When the moth is on the wing the long tongue is unwound and the lip inserted into the corolla of a honeysuckle flower, from which the nectar is taken (Fig 10).

Fig. 10.

All the Sphinges, or Hawk-Moths, delight to fly at twilight, and those entomologists who desire to *see* them fly should watch beds of nicotiana and petunias. The slightest movement—and away the elephants fly like a quick passing shadow.

OUR FRONTISPIECE.

THE coloured plate this month is from an original painting by Professor F. Edward Hulme, and is one of many which he has executed for the volume on British Butterflies and Moths which he is contributing to the Woburn Library. The insects represented are:—119, wood tiger, male; 120, wood tiger, female; 121 and 122, scarlet tiger larva; 123, scarlet tiger pupa; 124, scarlet tiger; 125, scarlet tiger at rest; 126, white dead nettle-food plant.



"JINGO."

ZOO NOTES.

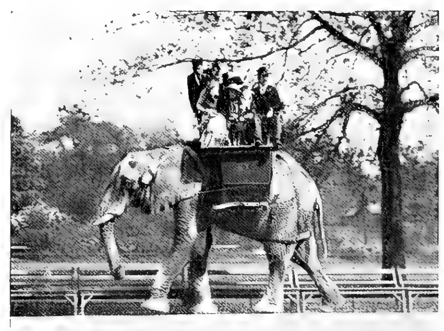
Described and Illustrated with Photographs

BY

W. P. DANDO, F.Z.S.

"Jingo," the late African Elephant.

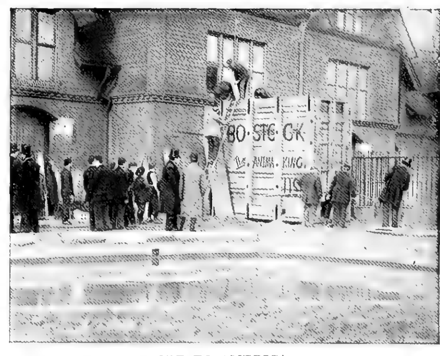
ALL lovers of "big things" were sorry when they heard that "Jingo" had been sold to America for a couple of hundred pounds. He was the tallest (9ft. 7in.) and most promising African elephant in captivity, and still had about eight years before reaching maturity, so there was every probability of his exceeding "Jumbo's" record height. Unlike his predecessor he left these shores without any "boom." It is said that when "Jumbo's" coming departure became known the Society realised £5,500 from the public who came to wish their elephantine favourite good-bye. This meant an extra attendance of at least a quarter of a million people. "Jingo's" sad death on board the "Georgic" from sea- or more probably home-sickness was a tragic end to the life of one who had given pleasure to so many children at the Zoo.



THE LAST TIME OUT.

"Duke" and "Nancy," the African Lions.

THE splendid pair of African lions depicted opposite are possibly the finest in captivity, and do credit to the Society as examples of the perfection with which wild cubs can be raised to maturity in captivity. Both these animals were presented to the Society by Messrs. Grogan and Sharp, the Cape-to-Cairo explorers.

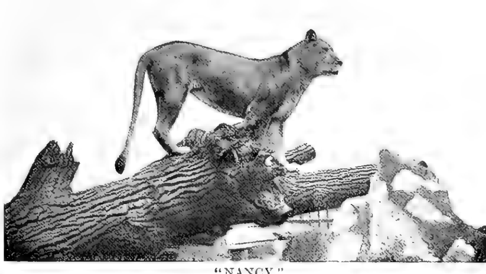


OFF TO AMERICA.

The Eagle and the Emu.

THE first of the two birds whose photographs are given on the next page—the Chilian Sea Eagle (*Geranoaëtus melanoleucus*)—is a native of South America, and is a very beautiful example of the "king of birds." The sea eagles include the largest members of the whole family; they build enormous nests, sometimes six or eight feet in diameter, and instances have been known of birds returning to the same "horst" for twenty years in succession. Every year some addition is made to the nest until it becomes five or six feet high. Two eggs are generally laid, and the male and female sit alternately.

"DUKE."



"NANCY."

"DUKE."

The other bird—the Emu—is every day becoming more scarce. The peculiar booming note uttered by the female emu must have been remarked by anyone observing these birds at the Zoo. The sound is emitted through a singular orifice in front of the wind-pipe, communicating with a tracheal pouch, this peculiarity being confined to the hen, which on account of its large size may be readily mistaken for the cock bird. During the breeding season the hen bird utters this remarkable percussive booming note, no doubt to attract the male bird. The emu is the second largest existing bird, being only slightly smaller than the ostrich; it is equally swift of foot, rivalling the kangaroo in speed, and affording good sport when chased by dogs; but when it is within close range, great care has to be exercised that one does not get within reach of the outward and backward kick of these birds, which would bring a man down easily, and often with severe wounds, their legs being exceedingly powerful.

Like the rhea, the male bird hatches the eggs, and when the Zoological Society

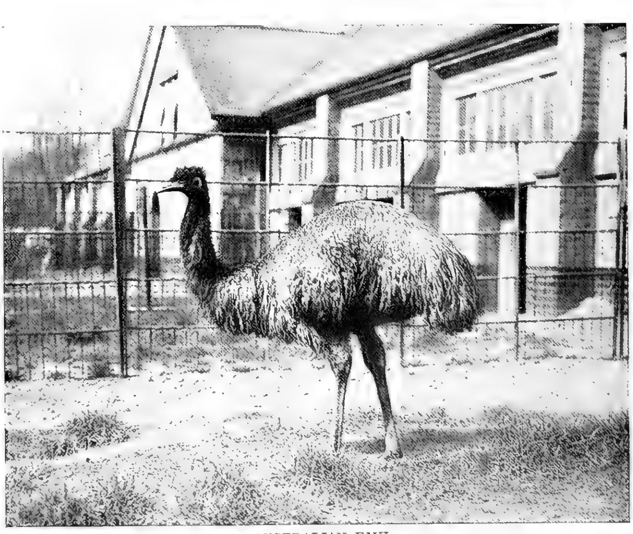
CHILIAN SEA EAGLE.

birds have. In order to rescue it from this suspicion, Mr. Jesse mentions that a female emu belonging to the late Duke of Devonshire, at Chatsworth, laid some eggs, and, as there was no male bird, she collected them together herself and sat upon them. With what result is not recorded.

Plovers, Swans and Gannets.

The first of the three pictures reproduced on the next page is an inhabitant of the Fish House, where the light is very bad for photography. This is the Golden Plover, scientifically known as *Charadrius pluvialis*, because it is said to be most seen and caught in a rainy season, although modern observation has proved that in rainy weather these birds are wilder and harder to approach than

kept the aviaries at their farm near Kingston, it is recorded that a pair of emus had five young ones. The hen, at different times, dropped nine eggs in various places in the pen; these were collected in one place by the male, who rolled them gently and carefully along with his beak. He then sat upon them himself, and continued to do so with the utmost assiduity for nine weeks, during which time he was never observed to leave the nest, nor the female to take his place. When the young were hatched, he alone took charge of them, the hen not appearing to do so in any way. It must not be supposed that the female emu is not possessed of that natural affection for its young which other



AUSTRALIAN EMU.

GOLDEN PLOVER.

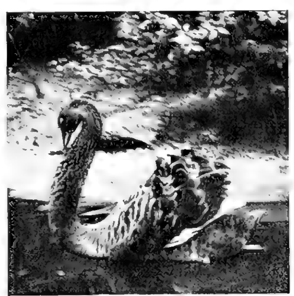
in fine. In winter the old male bird has all the upper part of his plumage sooty black, with large golden yellow spots on the margin of the backs of the feathers. This is partly due to new growths and also to some of the old feathers actually changing their colour, but how this change is brought about still remains a mystery. The species are plentiful and very widely diffused. They frequent sea shores and the mouths of rivers, congregating in such numbers as soon to exhaust the food to be found in any one place. They are therefore compelled to shift their quarters very often. Their food consists of insects and worms. The latter, it is said, they will cause to come above ground by striking with their feet. The worms are supposed to mistake the noise thus produced for the approach of their dreaded enemy the mole.

The second bird is the remarkable Black Swan (*Cygnus atratus*), of which a male and female are illustrated. The complete absence of the ordinary white colour of these birds is very curious. Some white feathers may be seen under the wings when open, as in the illustration of the female. They are inhabitants of various parts of New Holland, and have even given the name to the Swan River in Western Australia. The bill is orange-red and the feet brown, and although this species is as large as the common white, it appears to be rather inferior to it in strength.

BLACK SWAN.

The last bird is not a frequent guest at the Gardens, though, as everyone knows, Gannets are very numerous on the Bass Rock and certain other islands off the coast of Britain. It also appears to have two Irish stations, but its only English breeding-place is on Lundy Island, in the Bristol Channel. In old times the birds existed in considerable numbers, and even in 1860 the late Dr. Bryant reckoned the population of gannets on the Great Bird Rock to amount to the extraordinary number of 50,000 pairs. In 1887 not more than 10,000 birds were said to be there, and the numbers, as given by Mr. Lucus in the "Auk," 1888, pp. 129-135, are yearly decreasing, on account of the brutality of the fishermen. On all these places the birds arrive about the end of March, and depart in the autumn when the young are ready to fly. In appearance the gannet is as bulky as a goose, and with longer wings and tail, but he weighs considerably less. The nest of the gannet consists of a shallow depression made in weeds or grass placed upon the ledge of a rock. In this the female lays a single white egg. A method sometimes adopted for securing these birds consists in fixing a herring on a board and towing it along the surface of the sea; the gannets, seeing it,

COMMON GANNET.

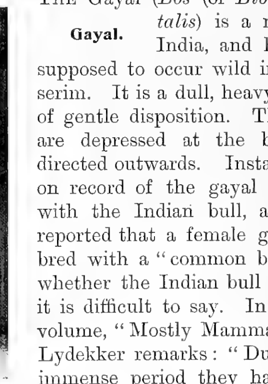

BLACK SWAN.

dart down upon it immediately, and generally kill themselves by the force with which they strike the board. On the Bass Rock, where these birds are protected, they become so tame that they will allow anyone to stroke them with the hand as they sit upon their nests. In their mode of life the gannet much resembles the pelican.

POLAR BEAR.

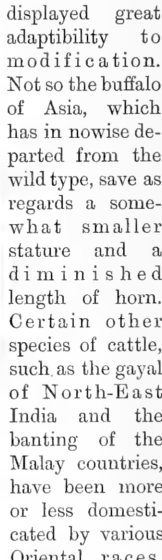
The Polar Bear.

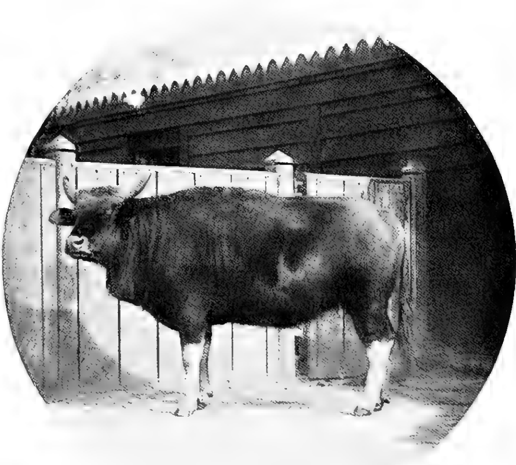
I WAS hoping the frost would continue long enough to freeze out the Bear Pond, and give visitors a chance of seeing this animal with something like his natural surroundings, but it was not to be, at least for the present. It is with pleasure we heard, at the last meeting of the Society, that the fact is now realised that more could be made of the enclosure within which the polar bear has been kept up to the present, and an attractive exhibit of this arctic animal may be expected. When a more realistic and spacious enclosure is provided, there is no doubt this animal could be made one of the sights at the Zoo, especially if a companion or two could be found to vary the monotony of the continual march up and down, only stopping at the end to raise itself up and drop down again and continue marching on for hours at a time. The *Ursus maritimus* is one of the largest of all bears, Captain Lyon recording the capture of one measuring close on nine feet in length, and weighing about 1,600 pounds.



Gayal.

THE Gayal (*Bos* (or *Bibos*) *frontalis*) is a native of India, and has been supposed to occur wild in Tenasserim. It is a dull, heavy animal, of gentle disposition. The horns are depressed at the base and directed outwards. Instances are on record of the gayal breeding with the Indian bull, and it is reported that a female gayal has bred with a "common bull," but whether the Indian bull is meant it is difficult to say. In his new volume, "Mostly Mammals," Mr. Lydekker remarks: "During the immense period they have been domesticated, the true oxen have displayed great adaptibility to modification. Not so the buffalo of Asia, which has in nowise departed from the wild type, save as regards a somewhat smaller stature and a diminished length of horn. Certain other species of cattle, such as the gayal of North-East India and the banting of the Malay countries, have been more or less domesticated by various Oriental races, although in the latter case the domesticated breed seems to be renovated from time to time with a cross of the wild stock."





GAYAL COW.

THE SNIPE AND ITS NESTING-HAUNTS.

Written and Illustrated with Photographs by WILLIAM FARREN.

Of all influences which tend to make changes in, or destroy the natural fauna of a country, the most effective is the slightest alteration or modification of the character of the country itself.

Probably the greatest change that has been made, and the one that has had most effect on the natural fauna, has been the draining and cultivating of the Cambridgeshire fens.

If we have had the opportunity of witnessing that now rare occurrence, a fen flood, we can better imagine what it was like when, every winter, the water lay over the land like a huge lake, the dead feathery reed-tops, and occasional tree-stumps and sallow bushes peering above the water, serving as landmarks to show the whereabouts of the higher land and the edges of the meres, where thousands of wild fowl congregated and wintered, finding there a feeding-ground and sanctuary only occasionally broken by the fenmen and their long-barrelled punt guns.

Then in the spring, when the waters subsided, what a breeding-ground it was! Large reed-fringed meres and inaccessible bog land and swamps, covered with sedge, rushes, meadow sweet, loose-strife, and other fen plants almost rank in their luxuriance. The swans, geese, and many of the duck family betook themselves to their northern breeding-haunts, while to the species which inhabited the fens all the year round, such as coots, grebes, moorhens, water rails, snipe, mallard, and teal, was added a mighty gathering of summer visitors; ruffs and reeves in great numbers; the black tern (which even now, although never stopping to nest, linger about the fen rivers on their summer migration northwards, as if in obedience to an impulse which prompts them to seek for the now vanished meres, once the annual nesting-haunts of hundreds of their species); redshanks, godwits, and some the very names of which as British breeding-birds sound to the ornithologist of to-day like some ancient myth; bitterns and avocets; even perhaps the spoonbill, all found for themselves and their young an inexhaustible food supply, together with the safety of an isolation such as was to be found in no other part of England. With these came ground-nesting birds of prey, short-horned owls, hen, marsh, and Montagu's harriers, the last three levying toll on the snipe and smaller wading birds, earning their name of "harriers" by even taking the eggs from the nests.

Now all is changed; those meres which have not entirely disappeared have dwindled down to ponds, and so the ruffs and reeves and other interesting birds, finding no more food and shelter in the fens than in any agricultural district, have ceased to visit this, their once famous haunt.

The fenman of to-day clings sufficiently to past traditions to still prefer a peat fire (although it is somewhat questionable whether coal would not be a more economical fuel), so the pleasant smell of burning turf hangs about the fen villages, and long lines of fresh-dug peat and huge square stacks break the monotony of the country. But, what is of far more importance to the naturalist, the peat-digging keeps some of the fen in an uncultivated state, where the snipe still breed in fair numbers.

There are several of these turf diggings near the larger fen villages between Cambridge and Ely, especially where the near vicinity of the lodes affords an easy means of carrying the turf in barges to the villages, "lode" being the fen name for the navigable canals which form a communication between the villages and the rivers. Long parallel trenches are dug six or eight feet apart, the intervening spaces remaining untouched for several years, during which time the trenches made by digging out the peat become filled with water. The country thus assumes an aspect of a number of alternating narrow strips of land and water, and in the rank grass and juncus covering these strips the snipe make their nests.

FOUR BEAUTIFUL PEAR-SHAPED EGGS.

Most notable of these breeding-grounds, which the turf diggings have preserved for the snipe, is that part of Burwell fen which forms the point of land between Reach and Burwell Lodes, and on the north of Burwell Lode towards Wicken Sedge fen. Here, in addition to many lapwings and a few pairs of redshank, nest annually some twenty to fifty pairs of snipe.

On a suitable day, from the beginning of April to nearly the end of June, they may be seen high up, flying with rapid wing beats in large circles; and as they reach a certain point they descend sideways for a short distance, making with their stiff wing or tail feathers a loud bleating noise. This is doubtless a habit due to the nuptial season, for it is only at this time of the year that it occurs; all day long the sound may be heard, and often after dark, when it becomes very weird and distinct in the stillness of night.

It is quite fascinating to watch this circling flight of the snipe and speculate as to when the bleating noise will be made. Sometimes the circles will be quite small, and as the temporary sidelong drop, with its consequent music, will take place at the completion of each circle, it naturally follows that it becomes more frequent as the circles become smaller.

On a warm, quiet day many will be on the wing at the same time, when the sound is suggestive of the bleating of a flock of deep-voiced goats.

The snipe's nest is not nearly so difficult to find as are those of most ground-nesting birds. There need be no tedious watching with field-glasses in order to mark the bird on to her nest, for the snipe is a close sitter, and it is only necessary to walk briskly up and down the ridges, keeping a sharp look-out the while. She will get up with a startling "flip" right at your feet, and go off with the familiar *scaape-scaape* to join her mate in his aërial circlings. As a rule the nest is slightly raised in a tuft of grass, especially so if the ground is very wet; a good deep "scrap-out" is made and

filled with dry grass, on which are laid the four beautiful pear-shaped eggs, with their rich olive and brown blotches. The young are delightful balls of rich dark-coloured down, spotted and striped with white, yellow, and reddish brown; they leave the nest as soon as all the eggs are hatched, and are strong on the leg and able to run quickly at once.

It is quite probable that two broods are reared, as nests with eggs may be found as late as June; this conclusion, however, is not altogether necessary to account for the late nests, as, apart from the probability that some may get taken, a good number are destroyed by some natural enemy, as the frequent finding of nests with empty egg shells amply testifies—the work, almost without doubt, of rats. Like most birds on the loss of their nests, the snipe lose little time in making a fresh start; but several weeks may be lost, and hence the late nests.

It was one of these late nests which gave me—towards the end of the first week in June—the opportunity of taking the photograph of the old snipe here reproduced. I knew of the nest, and also that the bird was sitting hard and likely to hatch-off any day; so I journeyed to Upware the first evening I was at liberty, and put up at that famous inn "Five Miles from Anywhere," and just before dark visited my snipe's nest, which contained three eggs, one of them already chipping. Hastily I made some necessary arrangements, such as clearing the herbage from one side of the nest and preparing a rough hiding-place for myself twenty yards away, where I could lie concealed and, by means of a length of rubber tubing, work the shutter of the camera.

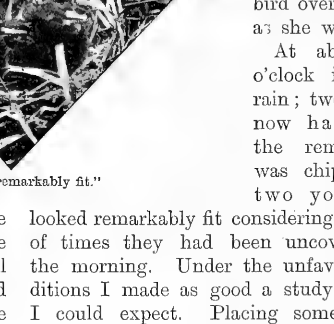
Early next morning I again went to the fen. The slightly altered environment had not caused the snipe to desert her nest, which now contained one downy youngster and two eggs. Both old birds flew closely around with anxious cries as I arranged the camera. Carefully noting that everything was in working order, I crept under the heap of cut sedge which I had placed ready overnight. Although I could see the nest, the intervening grass prevented my getting as clear a view as I could have desired. It was now half-past seven; the grey misty clouds of early morning had disappeared, and were replaced by others of more decided form, which were coming up at a good pace before the wind, but allowing brief gleams of the sunshine for which I had hoped. The snipe had moved further away, and I could hear one, probably the male, "bleating" a good distance off.

I began to fear they had taken fright, but at ten minutes to eight I heard the rapidly repeated cry which a snipe makes when alighting, followed by the whirring of wings close over my head, and I had the satisfaction of seeing her drop about six feet from the nest. It was a very anxious time for me; she was out of sight among some long grass, but I could hear her uttering low cries as though she mistrusted the lens which glared, single-eyed, before her. For a quarter of an hour she showed no sign, but at five minutes past eight she moved out where I could catch a sight of her, and, glancing nervously around, suddenly, as it were, she made up her mind and ran on to the nest. It was very dull, for a large cloud was passing over the sun; glancing

GATHERING THE EGGS UNDER HER.

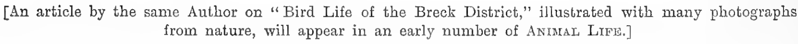
cautiously up I noted that it would soon be clear, and I decided to wait. The snipe in the meantime was gathering the eggs and young bird under her, and gradually settling down, until at last she remained quite still. The sun now glimmered out through the thin edges of the cloud: a good sudden squeeze of the rubber ball and—up went the snipe; but I heard the fall of the shutter before she rose, so I knew it was all right.

I made four other exposures, but the first was the only good negative; all the rest were under-exposed, owing to the dull light and the shaded position of the nest. After the first exposure had been made, and all was ready for another try, I heard the snipe alight, but did not see her. I could hear her "talking" for some little time, and then all was silent. I waited nearly an hour, when, thinking something must have alarmed her, I crept out of my hiding-place to investigate, when I had the disappointment of seeing her rise from the nest, where she had been quietly sitting all the time. Another attempt was attended with a similar result It was evident she had found a means of getting on to the nest which was beyond my limited range of view. Not to be beaten, I cut a narrow passage through the grass from the nest to my hiding-place, which latter I raised so that I could kneel instead of having to lie down. I could now see the nest distinctly, and kept my eyes fixed on it, only glancing up when I heard the snipe alighting, which she did on the other side of a clump of bushes; after a few minutes' watching, a slight movement was noticeable in the grass at the back of the nest, then the long bill came through, followed slowly by the bird in a crouching position. This time the fall of the shutter did not disturb her in the least, and, creeping from my hiding-place, I made a wide détour on hands and knees through the grass to behind the camera, and looked over it at the snipe only four feet away; she seemed surprised, and kicked the young bird over on its back as she went.

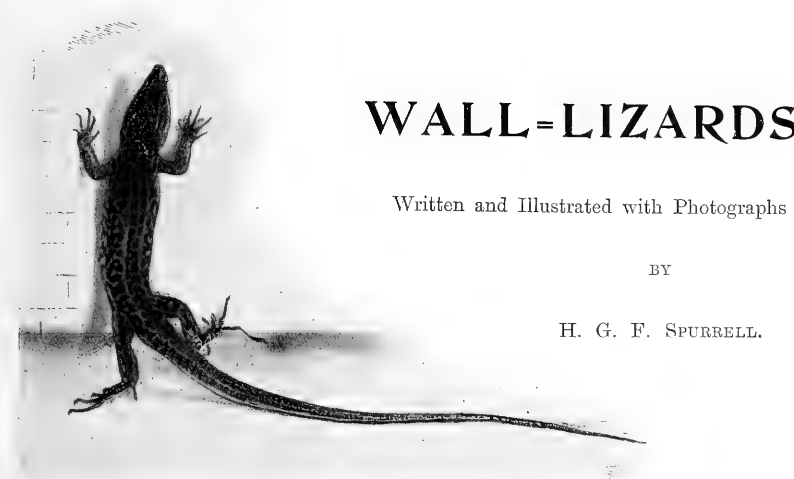


"Looked remarkably fit."

At about twelve o'clock it began to rain; two eggs were now hatched, and the remaining one was chipping. The two young birds looked remarkably fit considering the number of times they had been uncovered during the morning. Under the unfavourable conditions I made as good a study of them as I could expect. Placing some clumps of grass round the nest, and restoring the surroundings to their natural state, I wished my old snipe "good luck," and, gathering up my belongings, left her to finish her hatching in peace.



[An article by the same Author on "Bird Life of the Breck District," illustrated with many photographs from nature, will appear in an early number of ANIMAL LIFE.]



WALL-LIZARDS.

Written and Illustrated with Photographs

BY

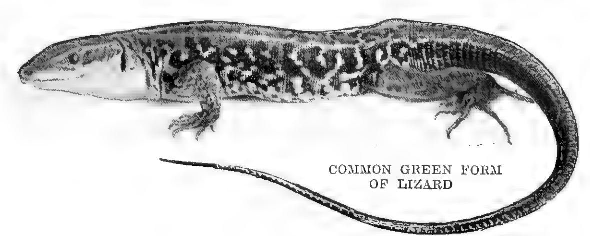
H. G. F. Spurrell.

WALL-LIZARDS are a feature of Italy, and far from being its least attractive feature. This is saying a great deal. Italy is a land where almost everything is beautiful except the beggars, and even they have such winning manners that one grows to like them—provided, that is, that they try to appeal to one's love of the picturesque and not to one's horror of the pathological. Yet the lizards hold their own. They have one great advantage: they are to be seen everywhere. They can be found without a long journey upon a moribund mule, and they need no guide to point them out and explain them inaccurately with exasperating attempts to be humorous.

There are lizards everywhere. They dash across the roads; they glance round the trunks of trees; and, to justify their name, they swarm upon every ruin and lurk in the chinks of every wall.

During my first few days in Italy there seemed to me to be an endless number of species. They were alike in grace of form and activity of movement; but each a law unto itself in colour. I caught some, and noted the similarity of the plates on their heads. I later collected some of the more striking varieties.

One of the handsomest types, and also perhaps the best known, is the green variety, as depicted in the first two photographs. These give some idea of its form and markings, and the second one of its proportions, as this is reproduced practically life size; but to its colouring no words can do justice. The ground-tint of the back was a brilliant metallic green. The head was green and bronze on the top, and white on the sides. The sides of the body were a bewildering



COMMON GREEN FORM OF LIZARD

mixture of browns and bronzes, with elusive touches of red and blue. In the armpit was a large blue spot with a wide black margin.

This variety is abundant in the neighbourhood of Rome, and generally throughout South Italy. It shades off into other varieties. Some I saw had the green back and the brown sides, but hardly any trace of the darker markings. In others the green could only be seen in certain lights. The next photograph (No. 3) might pass for another of the same variety, if not the same specimen, as the preceding ones. It represents, however, a typical specimen of a kind I found basking in large numbers on the volcanic dust of a scorched hillside near Naples. In the arrangement of its markings it resembles the green variety; but it is a study in browns. The only touch of bright colour it shares with its green relative is the blue "eye" in the armpit.

Totally distinct from any yet described was the specimen shown in the last two photographs. This individual was black, as though made of jet, picked out over the back and sides with small spots of orange yellow. The last row of spots, on either side of its plain black ventral surface, were a bright blue. In the young the ground-colour is a rusty black, and the yellow spots are larger, duller, and closer together. But in the adult the contrasts are startling.

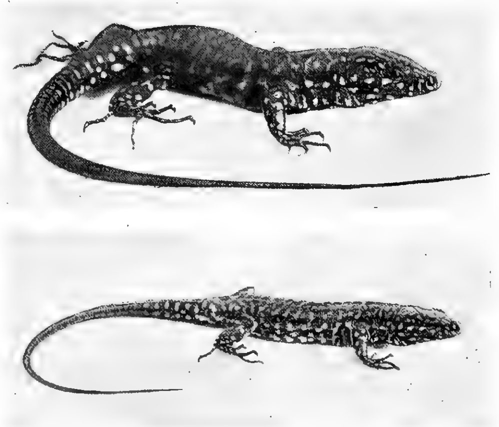
BRONZE VARIETY, WITH BLUE SPOT IN ARMPIT. (NAPLES.)

I found this type only in one place—the ruins of a house and its garden in Rome. Of all the wall-lizards I encountered this was the most active by far. Its agility was wonderful, and it seemed more arboreal in its habits than any other, and also far more wary. In the spot where I found it, it was numerous; but I had the utmost difficulty in procuring specimens.

The last type I shall mention is also distinct, and of marked individuality. A photograph of it appeared on page 574 of "The Living Animals of the World," to which I would refer my readers. A mere glance at its outline is enough to see that it is of an altogether lighter and more attenuated build than those depicted above. It is coloured in tints of bronze-brown above and yellow beneath, and in activity is a good second to the black variety. It belongs to north Italy. The specimen shown in photograph 6 came from Como.

No matter how much the wall-lizards differ in colour, they are all alike in one thing. They are about the most restless little creatures alive. Even when they come out for no more important business than to bask in the sun they are always on the move. If you frighten them, and they rush for shelter, you may be sure that they will come out into the open again almost immediately. For such active creatures they are, on this account, by no means hard to catch.

There is something bird-like in the way they watch you. Grab at them, and they skip just out of reach, no more alarmed than a London sparrow. Stand quite still, and they will come and investigate, perhaps even run over your feet.



A NATIVE OF ROME.

They make excellent pets. They will spring into your hand for food almost from the first, and are not dainty, either. They thrive on earth-worms, meal-worms, and such-like delicacies; they have plenty of intelligence: they do not require to see their food move — a point a snake insists on—but will eat scraps of raw meat out of a saucer. Nor are they wholly carnivorous. They relish a strawberry and enjoy pecking at a slice of banana, though they like fruit to be luscious, not hard. But put half-a-dozen lively flies into their cage—the excitement is tremendous. The lizards rush over the ground; they make wild leaps from the branches of the plants; and, if the roof is of perforated zinc, they will spring on to it and run to and fro upside down. The pursuit is soon over, and they return to bask in the sun, flattening themselves out upon the hottest rocks they can find, and skirmishing quaintly for the places where the slope is best suited for catching the sun's rays.

Wall-lizards are imported in large numbers, and may usually be bought in London for about fourpence each. They do well, as I have said, in captivity, and may even be induced to breed. Though they cannot stand the English winter out of doors, they require no extra heat in a room. But to see them as they should be seen, it is necessary to go to southern Germany or the countries on the Mediterranean seaboard.

A FOREWORD.

The Editor would like to draw attention to the fact that with the next number of this magazine (ready on June 12th), the first volume of Animal Life will be complete. A full index is being prepared for this, and will be given away either with No. 12 or No. 13. Cases will also be obtainable which will be uniform with "The Living Animals of the World." Full particulars will be given in our next issue. The Editor has made arrangements whereby he hopes to announce in the first number of the new volume an important Prize Competition, with many valuable prizes, open to all readers of Animal Life.

THE WHITE WOLF.

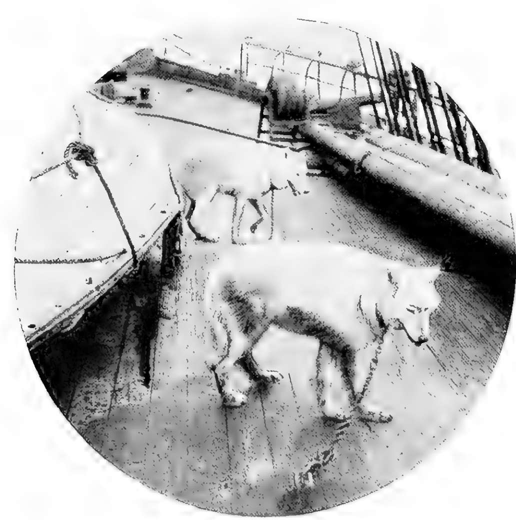
Written and Illustrated with Photographs by JOHANNES MADSEN, of Copenhagen.

WHEN, between 1891 and 1892, the "Hekla" expedition, under the command of Captain C. Ryder, was lying in winter quarters on the shores of Greenland, there were plenty of reindeer and not a few musk-ox to be seen, but no signs at all of the Polar Wolf. But when the Swedish Professor, A. G. Nathorst, in 1899, was in search of the unfortunate Mr. Andree in Greenland, he came across many tracks of white wolves, and was able to bring back one which he bought from the captain of a whaling ship. The year after, the writer of these lines had a welcome opportunity of visiting Greenland, and during his expedition had the same experience as Professor Nathorst.

Everywhere on shore (between 70° and 75° N. lat.) we found tracks of the white wolf, but never did we catch a glimpse of reindeer. One day we saw very plainly a pair of white wolves on the snow, but owing to the sea running very high it was quite out of the question to get a boat launched. During my trips on shore I was able to take several photographs from life of the musk-ox,* but none of the polar wolf, though, while following the tracks of the former, we sometimes observed those of the latter in the rear.

In the same year another expedition (a Swedish one, under Mr. G. Kolthoff) brought home two pelts of white wolves from East Greenland.

Two years after my trip to Greenland I visited Captain Otto Sverdrup, commander and leader of the renowned "Fram" expedition, to whom I am indebted for being enabled to make a very pleasant acquaintance with the two white wolves caught by him in Ellesmereland.



ADAM AND EVE.

It is rather interesting to observe how the polar wolves, during the last eight to ten years, must have wandered from the north down to the east coast of Greenland. All the observations made by Nathorst, Kolthoff, and our Danish Antarctic expedition result in the following facts, viz.: there have been found plenty of tracks of polar wolves from the north to Scoresby Sound, the wolves very likely wandering about both singly and in pairs; the reindeer, which in the year 1891 Ryder found in large flocks in Greenland, have completely disappeared.

The following facts relating to the subject, for which I am indebted to the kindness of Captain Otto Sverdrup, with leave to use them, will be found to be of interest. I need hardly observe that Captain

* An article on this animal will be published in a future number of ANIMAL LIFE, and also one, by the same author, on "The Scandinavian Elk."—ED.

Sverdrup, during the last four years, has been exploring until then unknown parts of Arctic America in a direction west of North Greenland.

Captain Sverdrup and his people came very often in contact with white wolves. They were always objects for powder and shot because of their attacks on the Eskimo dogs belonging to the "Fram"; all other animals Captain Sverdrup gave stringent orders not to shoot unless there was a plausible reason for doing so. He told me that he had often gone a long way round to avoid coming in contact with a musk-ox bull. He would not even kill a bull in self-defence.

"EVE."

One night, having gone to rest in his tent, Captain Sverdrup was awakened by the barking and howling of his dogs. On coming outside he saw his three dogs being attacked by eight white wolves, five of which he shot down, while three managed to escape. Another time he came across the yet warm and bleeding carcase of a musk-cow, which had evidently been killed by wolves; but there was nothing except their tracks to be seen. Very likely this musk-cow had been travelling alone by herself, which very often happens, for Captain Sverdrup told me that he had watched musk-oxen whilst actually being attacked by wolves, and that they stood in a ring around their calves, successfully defending them and themselves against the enemy. The wolves have a very poor chance in attacking a herd of musk-oxen, so they have to fall back upon foxes and hares. Even reindeer the wolves are very seldom able to get hold of, because as soon as they show themselves the reindeer run up to a herd of musk-oxen and seek shelter behind them. One day, Sverdrup's people managed to catch two white wolves in a trap. They were taken aboard the "Fram," and put into a cage made of planks two inches thick. The wolves—who were named "Adam" and "Eve"—did not get tame enough to permit the crew to chain them on deck until the last summer on the voyage home to Norway. They ate everything which was given them except lard, but they did not care much about bread. They were generally fed with dried fish, as well as dried or salted meat of walrus or ice-bear. They are not very big. "Adam," is about 70 and "Eve" 62 centimetres high across the shoulder-blade. Their sloping back and slinking motions make them look like hyænas; but all in all they are in appearance very much like elk-dogs.

"ADAM."

ANIMAL ANECDOTES.

How to catch Lizards.

A WRITER on Indian natural history tells how he decided to have a few red and green lizards in his new bungalow to keep down the mosquitoes:—"So Bugwan, the butler, was summoned, and to his great perplexity lizards were put on order—'live lizards, two dozen at least, and *ek dum*—right away.' But the Hindu 'boy' is a man of resource, and at tiffin time Bugwan, after consultation evidently with the other servants of the household, announced that the sahib's order would be obeyed that very night. The word 'night' arrested my attention, and I pressed my enquiries. In the result I resolved to accompany Bugwan and his friend the syce, or groom, on a lizard-hunting expedition. About an hour before midnight we sallied forth, and the method of capture proved to be simplicity itself. The syce merely climbed the lamp-posts along the roadway, and at the top of each he bagged a lizard! The dainty-feeding reptiles had adapted themselves to their surroundings of civilization; as the gas lamps attracted moths, there the lizards came at supper time. Each tiny creature seemed to hold undisputed possession of its own particular post, for in no single lamp did we find more than one solitary lizard. So the introduction of gas in the East has provided a comfortable and easy living for at least one tribe of our animal friends."

An Army of Ants.

"ON one occasion," says an Anglo-Indian, "when residing on the top floor of a lofty building in Bombay, we happened to leave overnight on the table of the balcony (four storeys from the ground) a bottle filled with sugar almonds, in which the cork had not been replaced. Next morning, by daybreak, we discovered that an army of millions of ants were ascending the house wall in a solid column a foot wide, while a second army was descending by a parallel line, also in compact regular formation. Each retiring soldier ant carried in its arms a tiny morsel of the sugar taken from the almond bottle, where now there was hardly a trace of the white coating of some fifty sugar almonds left."

Cleaning Windows with Snails.

"AN old coloured woman selling snails occasionally makes her appearance in certain streets here," says a Philadelphia paper; "she carries an old basket in which the snails repose on freshly-sprinkled leaves." These are not sold as food, but for cleaning the outside of window panes—an old practice still in vogue in Kensington. The snail is damped and placed upon the glass, where it at once moves around and devours all insects and foreign matter, leaving the pane as bright and clear as crystal. There are old-established business places in Kensington where the upper windows, when cleaned at all, are always cleaned by snails. There is also a fine market for snails among the owners of aquaria, as they keep the glass clean and bright.

A Truant Mustang.

A FEW years ago a black stallion, the leader of a herd of wild horses in northern Arizona, was finally shot after repeatedly showing his heels to the best horses in the country. On his flank was the brand of the Bar L ranch, a large establishment owned by the Perrin Company. It was learned then that three years before, when a half-grown colt just from Kentucky, he had escaped from the barn and joined the wild herd. He recovered from his bullet wound, and for three years won races in Arizona, New Mexico and California, the combination of his good breeding and his early life with the wild herd giving him speed and stamina which sent him to the front.

A Chinese "Sport."

COMPARED with the insect fight, the Spanish bull-fight is very tame, in the opinion of the Chinaman, at least. The insect used by the Chinese for these fights is known as the Mantis. Two insects are put in the case at a time. No sooner do they spy each other than both remain stiff and motionless, fixing their eyes on each other. In this condition they continue a long time, while the spectators tap on the glass and use every expedient to urge them on. Suddenly the whole frame of each becomes violently

agitated, the neck is stretched out, the wings expand and flutter, while the rest of the body and tail quivers with apparent emotion. They rush towards each other with the utmost fury, and hew away with their sharp, sabre-like feet with such ferocity that it is seldom that they loosen their hold without bringing away at the same time a limb or some other part of the body of their antagonist. The usual termination of these fights is the death of both the combatants, neither of them hardly ever surviving the fray.

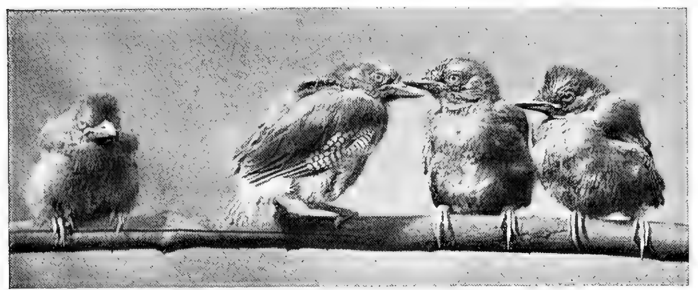
Forest Foes.

Two hunters recently made a trip to the Kettle River, and in the course of the hunt witnessed a rare occurrence. They had been on the trail of a large buck for some time and, as it chanced, came in sight of him at the very moment when a cougar launched himself upon him from the limb of a tree. The cougar landed squarely on the buck's shoulders, almost throwing him to the ground. The buck quickly recovered, however, and, throwing back his head, drove two prongs of his antlers into the cougar's body, and with a swing forward threw him to the ground. Leaping backwards, he then waited with lowered head for a second attack. He had not long to wait, for with a yell of rage and pain the cougar sprang upon him. He might as well have leaped against an array of bayonets, for he was caught on the buck's antlers and hurled several feet into the air. The instant he struck the ground the deer was upon him, striking savagely with his forefeet, which cut like knife-blades, and driving his antlers again and again into his body. Finally they separated, and the cougar, sorely wounded and almost disabled, crawled forward for the final struggle. The deer was covered with blood, but was still in excellent fighting trim. At this point the hunters interfered; one of them walked up to the cougar and shot him through the heart. Even then the buck went up to his foe, smelled him and struck him a few times with his feet, after which he turned and walked away. The hunters, with a sense of justice which, it is to be hoped, prevails among their kind, suffered him to go unmolested. The cougar was skinned. He measured eight feet from tip to tip.

"He was caught on the buck's antlers and hurled several feet into the air."

The Results of Drink.

In Russia, when the villagers know that a bear is prowling about in their neighbourhood, they fill an enormous tub with the national spirit, "vodka," and so place it that its pungent odours never fail as a bait to the animal, who drinks heartily and is speedily overcome. Then chains are passed round his body and a muzzle adjusted, after which he is conducted in triumph through the village.



Photograph by J. T. Newman, Berkhampstead.
YOUNG JAYS.

NOTES AND COMMENTS.

The Jay.

The Jay, which may soon be reckoned among the lost birds of England, is an interesting example of coloration in animals. It has a variegated and beautiful plumage, and when seen flying across an open sunlit space is nearly as conspicuous as a magpie; but (says Mr. W. H. Hudson) among the dense foliage of the woods and thickets he inhabits it is as difficult to see a jay as a woodwren; and it is doubtless owing to this fact, and to his extreme wariness and cunning, that he still survives in many parts of England where the magpie has now been extirpated, although both species are pursued by gamekeepers with the same stupid and deadly animosity. A thick holly or other evergreen is one of the favourite sites for a jay's nest, which is built of sticks and twigs, sometimes mixed with mud, the cup-shaped cavity being lined with fine roots. Four to seven eggs are laid, pale greyish-green in ground colour, thickly speckled and spotted all over with pale olive-brown. The young birds follow their parents for some weeks after leaving the nest.

A Clever Collie.

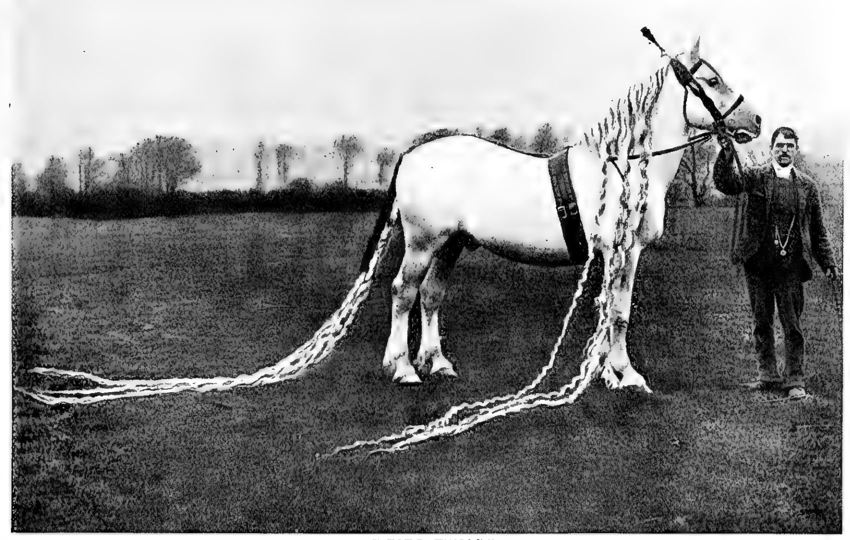
In a previous number of Animal Life we gave some pictures of a clever little fox terrier who counted thought-reading among his many accomplishments. We are now able to give two portraits of a local celebrity, well known and widely respected at Hove. His name is "Jock," and his master is Mr. F. D. Darbyshire, of Melrose Hall Hotel, who has kindly supplied us with the following information concerning this gifted collie:—"Jock is now about six years old," he writes, "and was brought from Deeside when about ten months old as a present to my mother. It is difficult to say of which of us he is fondest, and he divides his time between us pretty equally. He was, of course, quite untrained when he came south, and I never formed any definite intention of training him in this way; but having noticed his exceptional intelligence, I took to teaching him a few simple tricks when he was about two years old, and found him so apt a pupil that I became interested in the cultivation of his powers. He has considerably greater brain development than most collies; indeed, his breadth of head rather suggests the retriever, though he is pure bred. I am often asked 'how' I taught him. This is a question I find difficult to answer categorically. I think it is an important point that I did not make a

Photograph by Mora, Ltd.
"JOCK," THE BRIGHTON CELEBRITY.

beginning until I had had him quite a long time and he had become very much attached to me; hence his anxiety to please made him quick to learn. This, I am sure, is half the battle in a matter of this kind. I am not a professional dog-trainer, and know nothing of the methods usually adopted, though one hears queer stories, most of them I should imagine apocryphal, but I am quite sure, from my own experience, that you can get more out of an animal by love and kindness than in any other way." "Jock" does not often appear in public as a performer, being strictly an amateur, though occasionally he helps some charity by giving a side show at a bazaar, when he often adds £5 to the funds. But in private life he is much in request, and generally takes his share in the entertainments which are got up at the Melrose Hall Hotel during the winter months. He takes a real pleasure in performing, and is quite offended if he is not "in the bill."

Equine Monstrosities.

On this and the two following pages we are able to give portraits of eight animal abnormalities, all of which belong to Mr. E. H. Bostock, of the Glasgow Hippodrome, to whom we are indebted for permission to reproduce the pictures. The three first are of two long-maned horses—"White Wings," said to be "the most beautiful horse alive," and "Linus," who boasts a tail seventeen feet long, and a double mane, thirteen. The half-dozen other animals are "Wild Nell," a hairless or india-rubber skinned mare; "Jonathan" and "Mike," the greatest contrast in donkeys ever seen; "Dinah," an equine mountain twenty-one hands high; and lastly, "Columbus" and "Dot," the giant and midget, or, as the picture might aptly be called, "Dignity and Impudence." We should advise our readers, whenever Wombwell's Menagerie is in their neighbourhood, to make the personal acquaintance of these queer animals as soon as possible.

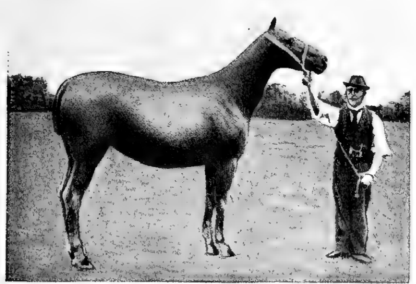


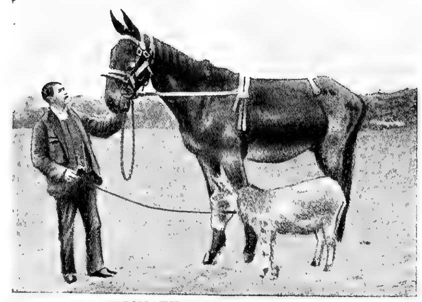
"WHITE WINGS."

An Erratic Lamplighter.

We have to thank an Ipswich correspondent for sending us the following cutting from the "Evening Star" of March 23rd this year. Here is the whole story from the start: A well-known Ipswich gentleman wrote to the local Gas Company a short time ago complaining that the gas-lamp in front of his house was frequently out at night, though he admitted, at the same time, that when artificial light was not required the gas was turned full on. The lamplighter was questioned on the matter, and was certain that he always lighted the lamp at the proper time. It was thought that mischievous boys were at the bottom of the affair, and a watch was kept without result, except to find that the lamp was almost invariably alight during the day, and sometimes out at night. The gentleman who had made the complaint got a ladder and investigated matters more closely. He found that the two chains that worked the bye-pass moved very easily, a mere touch bringing down the one that was highest, but they could not be moved by the wind or by their own weight. He then remembered that last year a pair of wrens built their nest inside the lamp-post, and reared a brood there; so he watched again. This time he was rewarded by seeing what had seemed a mystery explained. A wren alighted on the ring at the end of one of the chains, and up went the gas. He informed the Gas Company of his discovery, and added that he hoped the birds would not be disturbed. It will be gratifying to bird lovers to know that his wishes will be strictly respected, and the servants of the Company who light and clean the lamp have been instructed to take particular care not in any way to molest or alarm the tiny tenants of Mr. and Mrs. Wren's town house.

TWO VIEWS OF "LINUS," THE LONG-MANED HORSE OF OREGON, U.S.A.


"WILD NELL."

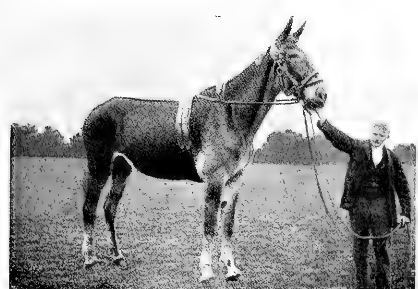

"JONATHAN" AND "MIKE."

A Rare Pet.

THE Antelope whose portrait is reproduced at the top of the next page was good enough to give us a special and exclusive "sitting" at our photographer's studio in Chancery Lane. With its owner, Mr. Harold O'Donnell, it took a cab from Belgravia, and arrived punctually at the time appointed. With commendable promptitude it adapted itself to the circumstances, and wasted nobody's time in useless antics, but at once posed itself in the positions required, with the result that four excellent portraits were taken, of which the accompanying is, perhaps, the best. Its first introduction to its present owner was at the tender age of two weeks, when it was brought into his camp near the village of Essiaman Kuma, in Ashanti. No trouble was spared to rear the newcomer; an excellent feeder was made by attaching to an empty champagne bottle an india-rubber contrivance used for filling a fountain-pen. From milk the little fellow soon took to bananas, and now he is almost omnivorous, eating any vegetable or fruit; and if he gets a chance at a piece of bacon-rind or a boot he is quite content. He is, however, happiest in the company of a dog or cat, to play with and butt. He is never taken out on a leash, but follows close to heel.

A Heroic Deed.

MR. O'DONNELL also tells the following touching story of an incident which he witnessed a few years ago:—"While on a passage," he says, "from Skagway in Alaska to Seattle, the captain of the small coaster saw two Black-tailed Deer swimming from one of the smaller islands to the larger one of Baranof, where the channel was about half a mile broad. The steamer was stopped and a boat lowered, the men in it having orders to catch


"DINAH."

"COLUMBUS" AND "DOT."

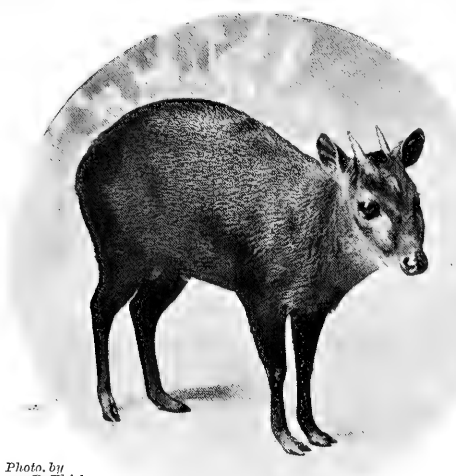


Photo. by R. Thiele, Chancery Lane.

A PET DUIKER.

them alive. As soon as the poor creatures saw the boat approaching they made every effort to reach the shore; they had little chance, however, of escape, for deer, with their small feet, swim but slowly. The boat was quickly gaining; one of the animals was about fifteen feet in front of its fellow, and only thirty yards from the shore, the boat a few yards only from the hindmost one, when suddenly there was a shout on board, 'the front one has turned round!' It was true enough; it had turned deliberately, and going quickly towards its companion, began helping it along by swimming and pushing at its side. I am not ashamed to admit that I turned away at this point. I found out afterwards that they became quite tame and had a good home in the park at Seattle."

The Bull-Frog.

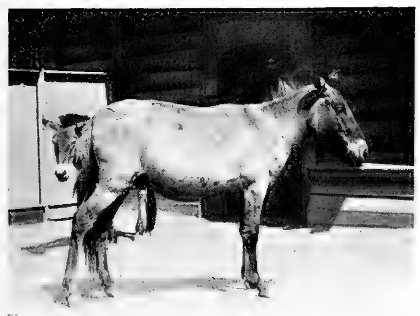
To Dr. R. W. Shufeldt, of New York, we are indebted for the following note:—"A great many species of frogs are found in various parts of the world. Those most nearly related to the Common Bull-Frog all belong to the family *Ranidæ*, and it is in this group, too, that we meet with the Common Frog of Europe (*R. temporaria*), as well as that other celebrated European species, the Edible Frog (*R. esculenta*). Some frogs are of great size, but in this respect, so far as the writer is aware, none exceed the bull-frog of North America (*Rana catesbiana*). One in the collections of the United States National Museum has a total length of nearly two feet. The one in the accompanying photograph measured considerably over a foot. Young frogs pass through certain well-known stages before assuming the adult form. These stages are undergone in the water, and include the passage from the egg to the young frog, including the tadpole stage, the development of the limbs, and the loss of tail and other changes. Bull-frogs spend most of their time in the water. They feed principally on worms, insects, crayfish and other forms."

Photo. by Dr. Shufeldt.

BULL-FROG.

THE FAN-TAILED SQUIRREL.

From an original painting by the Hon. ALICE FOLJAMBE



Photographs by C. V. A. Peel.

PRZEVALSKY'S HORSE.

WILD HORSES, ASSES AND ZEBRAS.

By C. V. A. Peel, F.Z.S.

IN England we never get further than the study of the domestic horse, the Wild Horses, Asses and Zebras coming in for a very small share of public attention. We make no attempt at breeding mules, as is done so extensively and with such great profit in France, nor do we make cross-breeding experiments with horses and zebras as the Germans and Americans do on a large scale; Professor Cossar Ewart's Penicuik experiments are the only British attempts in the latter direction.

Przevalsky's Horse, for specimens of which the sum of not less than £800 a pair was given recently in England, has been regarded as a domesticated animal run wild. Mr. Carl Hagenbeck, who obtained a large herd of these animals in Mongolia, does not believe this, from the circumstance that the Mongols who caught them state that the animals have been wild for hundreds of years; but this does not by any means prove the case. This large herd, specimens of which have now found their way all over Europe and to the American Zoological Gardens, was captured in three different districts south of the Mongolian town of Kobdo, near the Altai district. The horses travelled twenty days to Kobdo, and ninety-five days from Kobdo to the Siberian railway, and from thence to all parts of Europe and America. The foals are caught with slings on long sticks by the Mongols, a number of whom gallop down upon a large herd at a given signal. When caught they are fed by Mongol mares, which act as their foster-mothers. These curious yellow-coloured horses are capable of enduring extraordinary hardships. They can live without food and water for a much longer period than any of our domesticated horses or ponies, and if properly interbred with hardy Shetlands or New Forest animals an extremely valuable animal should be the result. But, so far, nobody in England has taken the trouble to utilise these valuable horses. Przevalsky's horse differs from the domesticated horse in the mane being erect and without a forelock on the forehead, and in the hairs on the tail not extending so high up. The yellow colour of the body becomes darker on the back; but there is no distinct stripe. The belly is nearly white. It has not yet been definitely decided if this animal is a distinct variety from the Tarpan or not. Tarpans are also

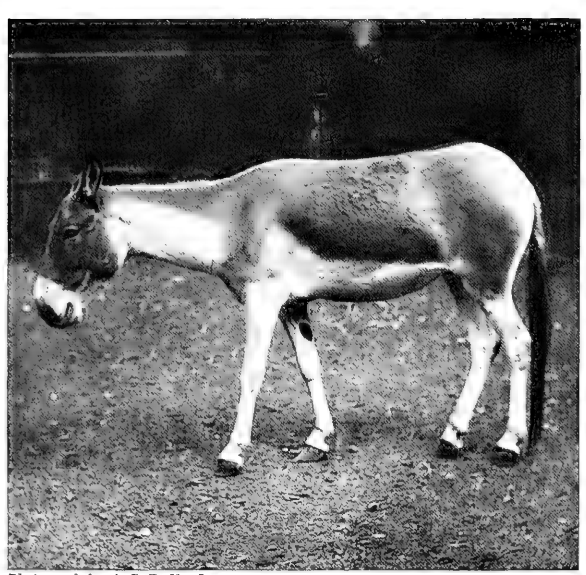
Photo. by C. V. A. Peel.

HEAD OF SOMALI WILD ASS.

inhabitants of the remote parts of Central Asia. They are of a reddish-grey colour, with the nose white; and are smaller than domesticated horses. They frequent the open plains, exhibit wonderful speed, and are extremely wary of man.

The African Wild Ass is now regarded by all zoologists as the origin of our domestic animal. It is found in Abyssinia, the Nubian Desert and other parts of N.E. Africa lying between the Nile and the Red Sea. The body-colour exactly resembles that of our domesticated ass, and there is a distinct shoulder-stripe. The ears of African wild asses are much longer than those of the wild asses of Asia.

The Somaliland Wild Ass is easily distinguished from the ordinary African wild ass by its more greyish colour, the entire absence of the cross-stripe over the shoulders, and the numerous and distinct cross-stripes on both fore and hind legs. The length of one obtained by myself in Somaliland measured seven feet two inches from tip of nose to end of tail, and its greatest girth was three feet nine inches. These hardy and powerful-looking animals are found in Guban, the great maritime plain between the Gulf of Aden and the Gulis range of mountains in northern Somaliland.



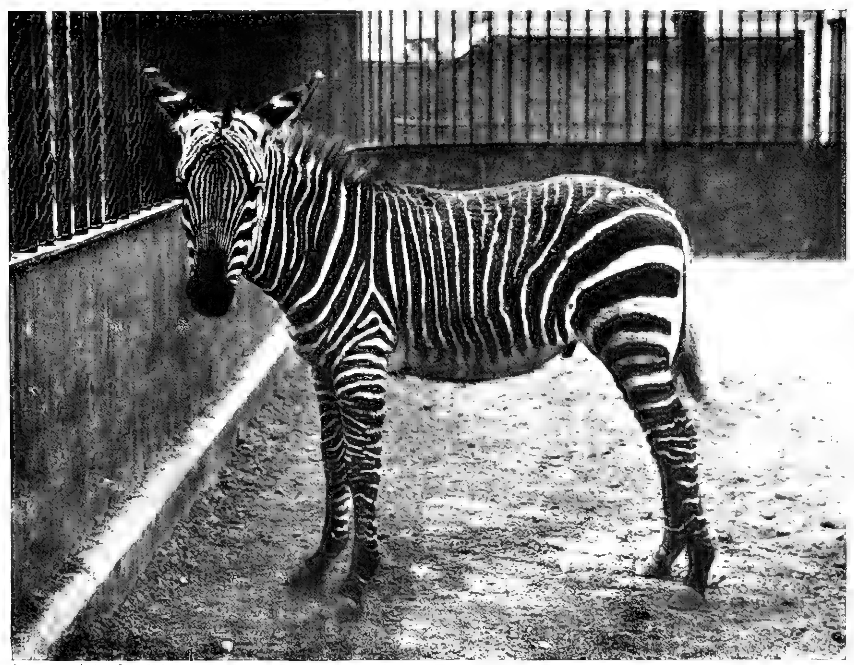
Photograph by A. S. Rudland.

KIANG, OR TIBETAN WILD ASS.

I encountered a large herd whilst marching through the desert lying between Hargaisa and Berbera. It was a wonderful sight to watch the strange animals go lumbering over the sand and rock, stirring up huge clouds of dust, and halting every now and then and turning round to see what was following them. They were found to be quite fat, although it was a mystery to me how they obtained enough grass to keep themselves alive in such a parched-up, desolate country.

The Asiatic Wild Ass is found in the vast open steppes in Syria, Persia, Afghanistan, the Punjab and Tibet, in which latter country it is known as the kiang. It is usually found in herds varying in number from four or five to thirty or forty individuals. The variety known as the kiang is perhaps the largest in size, reaching fourteen hands. Its colour is a rufous-bay, with a much narrower dorsal stripe than is found in the Indian form known as the onager. The kiang inhabits the most desolate country in the vicinity of lakes and rivers. When stalking more valuable game these animals are frequently a great nuisance, as they will insist upon galloping down upon the sportsman to make out what he is. Where they are little molested they show but little fear of man, and will stand and gaze at him from a distance of fifty yards. In Tibet the kiang breeds with the horse, and the produce is highly valued.

The True or Mountain Zebra is the second most beautiful of the zebra group, and is the smallest of the zebras. Its hoofs are more constricted than those of Burchell's zebra, and better adapted for climbing mountainous country. A few remain in some of the districts on the east side of Cape Colony, where they are protected on the summits of the Zwartberg, Sneuwberg and Winterhoek ranges. The mountain zebra stands about twelve and a half hands high. The legs are short; the ears are longer than Burchell's zebra, and give to the animal a more asinine appearance. The body is silvery white, and the markings, of very dark brown, extend to every part of the body except the abdomen, which is white. The ears are broadly barred with black. The front of the muzzle is very brown.



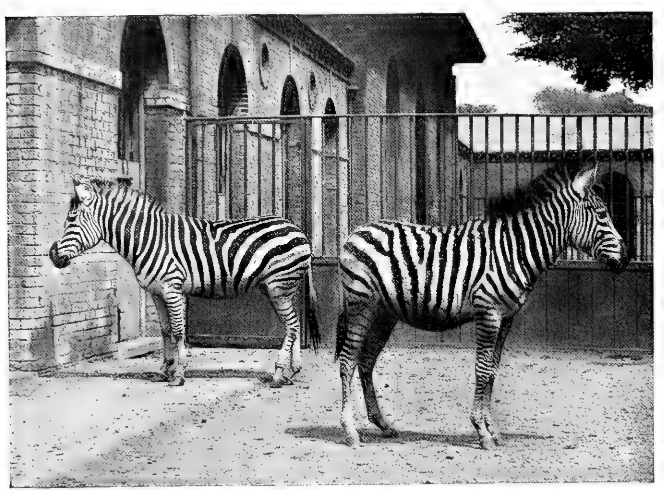
Photograph by G. W. Wilson, Aberdeen.

MOUNTAIN ZEBRA.

Burchell's Zebra, inclusive of its numerous races, is a dweller in the open plains. It is still plentiful in the districts to the south of the Botletti river, to the north of the Kalahari desert, on the plains of the Chobi and Zambesi, in British Central Africa, German East Africa and British East Africa.

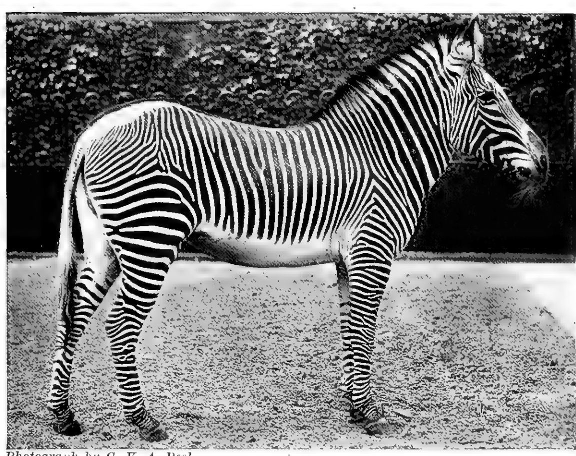
The bands of dark brown on the Burchell's zebra are not so distinct and beautiful even as those on the mountain zebra. In Portuguese East Africa this zebra was found lately to inhabit mountainous country. Burchell's zebra stands thirteen hands high. It has frequently been broken to harness, and breeds well in captivity. In some races the legs are striped right down to the hoofs; one of these is known as Chapman's zebra, and another as Grant's zebra.

We now come to the most beautiful of all the three zebras, namely, Grévy's Zebra, which is the largest of the family—a fine stallion standing fourteen hands at the withers. The first specimen seen in Europe was presented to M. Grévy, the President of the French Republic, by Menelek, King of Shoa (now King of Abyssinia), in 1882. It is found throughout Abyssinia and Somaliland. The length of a male from tip of nose to end of tail is 10 feet 6 inches. The Somali zebra, as it is frequently called, is a magnificent-looking animal, very massively built. The ears are enormously broad, are tipped with white, and have a band of dark brown from three-quarters of an inch to three and a quarter inches broad. The front of the face is most beautifully marked with brown stripes. There are a very great number of narrow bands on the body and legs and a dark brown band down the back and tail, the latter striped and spotted with brown. The stripes vary enormously in all my skins. To see a large herd or collection of herds of this beautiful animal together on an open plain is the sight of a lifetime. I quote the following from my Somaliland diary:—"After breakfast I sallied forth to sit near one of the wells and wait for zebras to come in for their afternoon drink, as I was most anxious to secure a skin of this beautiful beast. Directly I got outside my tent I beheld a grand sight; the grassy plain was what my headman called 'covered up with game.' Sitting down with my telescope I counted over one hundred zebras quietly feeding towards the water, and Sœmmerring's gazelle were dotted about wherever I looked. We walked across the plain, the gazelle slowly moving out of our way on either side of us and standing to stare at so unaccustomed a sight. We sat down close to the well. But what with the flies and what with the heat I soon voted it not good enough, and walked forth to meet the incoming zebras. But there they stood right out in the open under two or three solitary trees, a long, long shot. There they stayed and refused to budge, standing in couples facing both ways. At length I determined to try and reach a bush about one hundred yards from them, and in order to accomplish this I was obliged to crawl in full view of them for some fifty yards. My lazy shikari, however, would not crawl, but squatting down he walked crab-like, waving the rifle about on high as he proceeded. Turning round I beckoned him to crawl; but it was too late, the zebras had seen him. They began to walk slowly away. I snatched the rifle from my shikari and ran through the bushes to try and get level with them, or if possible in front of them, as they walked



Photograph by W. P. Dando, F.Z.S.

ONE OF THE RACES OF BURCHELL'S ZEBRA (Mare and Foal).

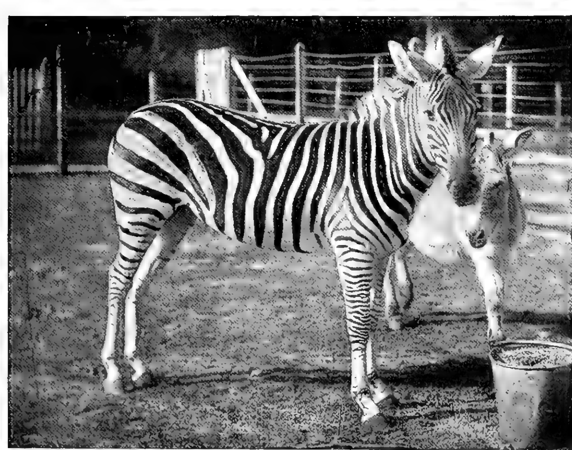


Photograph by C. V. A. Peel.

GRÉVY'S ZEBRA.

parallel to the bushes. They were not seriously alarmed, but trotted quietly towards the bushes instead of keeping to the open plain where they had been standing safe for so long. I raced on parallel with them until they suddenly came to a standstill to stare about them. I sat down hot and very shaky, aimed at a big stallion, and fired. The animal aimed at ran on for some ten yards and then fell over dead. I raced on through the bushes to try to keep up with the cloud of dust as the whole hundred dashed away. At length I heard them stop, but the dust was at first too thick for me to see them. At last, however, the wind blew some away and disclosed a sight I shall never forget. Surrounded by a halo or vignette of dust stood this magnificent herd, making the most perfect framed picture it is possible to imagine. I stood and gazed enchanted, and nothing would have induced me to fire at them again. After staring long at me they turned round, and I watched the great yellow cloud of dust, as the herd made good their escape, looking like the steam from a locomotive wending its way through trees and open plains as far as the eye could see."

In thick bushes, when the sun is shining, these zebras are extremely difficult to see, the brown and white flickering together into a grey which harmonises in a wonderful way with the zebra's natural surroundings. This protective colouring has been noticed in many other striped and spotted animals. My first sight of a Grévy's zebra I shall not easily forget. I was walking through comparatively thin bush country when my shikari suddenly stood stock still near a small, narrow, open bit of ground and whispered, "Feroli" (zebra). But stare as hard as I could I saw nothing but an open plain surrounded by thorn bushes. My shikari literally shouted in my ears: "You never see it, you no see zebra?" as he pointed with both hands. "No, I



Photograph by D. Součff.

CHAPMAN'S RACE OF BURCHELL'S ZEBRA.

never see it," I answered, staring my eyes out in the direction indicated by him. And I verily believe I might have stared for hours had not the zebra heard my shikari, who was shouting and gesticulating close to my ear. When the zebra moved I could hardly believe my eyes. It seemed to have appeared out of space. I had been staring at him as he stood broadside on to me quite close, and not until now had I seen him!

The neigh of the Somali zebra is a grunt and squeal, and can easily be distinguished from the neigh of Burchell's zebra. The sound, when heard close by one's camp at night, is weird and uncanny in the extreme. The zebra's neigh was often answered by my donkeys in camp. Zebras are always found in the vicinity of water, for they must drink every night. One of the finest collections of zebras and wild asses in captivity in Europe is to be found at the present moment in the Zoological Gardens in Regent's Park. The collection contains specimens of several forms of zebra, namely, Grévy's, Grant's, Chapman's and the Mountain Zebra, besides the onager, the kiang, the Egyptian wild ass, the Somali wild ass and Przevalsky's horse. My photographs of the latter animal were taken in the Zoological Garden in Moscow, the first city in Europe in which these animals were publicly exhibited.

Photograph by C. V. A. Peel.

GRÉVY'S ZEBRA AT HOME.

The Berlin Zoological Garden has also a fine collection of horses, asses and zebras, and all the Continental gardens possess a specimen of the Shetland pony, with which animal foreigners seem hugely delighted.

Burchell's zebras have often been broken to harness, especially in South Africa, and here in England Mr. Walter Rothschild used to drive a team of these animals. Zebras are extremely difficult to catch even when very young, and it takes a good horse to come up with a foal and separate it from its dam. A Burchell's zebra costs, in Europe, from a hundred to a hundred and fifty pounds.

The flesh of wild asses, horses and zebras is not at all bad, but the brilliant yellow fat, when seen uncooked, is rather apt to put one off horse flesh.

Mr. Carl Hagenbeck, of Hamburg, is one of the biggest importers of wild asses, horses and zebras, and when last at his animal park in Stellingen, near Hamburg, I saw a herd there of no less than seventy Burchell's zebras which had all been captured in German East Africa. These animals soon get distributed all over Europe, and many go to the United States, for the Americans have now some very fine

zoological gardens. To give some idea of the prices asked and obtained for these animals, on referring to Carl Hagenbeck's catalogue, I find a female Chapman's zebra marked at £150.

Zebras breed readily with horses and asses, and a very fine hybrid may now be seen in the London Zoo. Wild asses and zebras are curious and inquisitive animals, and will frequently walk right up to one's camp to see what is going on. In the old days, when game was thick on the South African veldt, zebras would accompany the Cape carts drawn by oxen for miles, gambolling and curvetting all round them. Naturally under these circumstances they were not—especially the foals—very difficult to catch. At one time half-broken animals were used on some of the coach lines in the Transvaal, and speedily became comparatively tame, though at times their peculiarities were said to "out mule the mule." In any case, however, as draught animals, in the ordinary sense of the term, they cannot be pronounced an unqualified success. Possibly hybrids might prove more amenable to bit and bridle, but that remains to be seen.

Photograph by Percy Ashenden.

BURCHELL'S ZEBRAS AT HOME.

In Tibet, the sportsman's stalk after ibex or Tibetan gazelle is frequently spoilt by the kiangs, the wild asses of that region, which, when they have sighted a man, come galloping down the hill towards him and frighten off the better game, much to the annoyance of the sportsman.

NOTICE.

The Editor desires to draw attention to the announcement in another part of this Magazine concerning the new volume of Animal Life which begins with the next (July) number; that number will also contain full particulars of a Prize Competition. The Editor regrets that owing to the elaborate nature of the index to Vol. I. it has been found impossible to print it in the current number; it will, however, be given away with the next issue. Binding-cases and title page, etc., will also be ready immediately.

THE SCANDINAVIAN ELK.

Written and Illustrated with Photographs by JOHANNES MADSEN, of Copenhagen.

THE night train for Norway leaving Copenhagen at 10 p.m., after passing the next morning the renowned waterfall called Trollhättan, traverses the southern part of Sweden, through large pine forests and across big moors.

It is there the Elk feels at home, protected by a stringent law, according to which elk-shooting is only allowed for fourteen days in the month of October.

Especially during the spring and summer, elk range right up towards the polar circle, through the northern parts of Sweden and Norway.

The writer of these lines had been up to Christiania, the capital of Norway, to see Captain Sverdrup and to take photographs of his white wolves.* He was then told that occasionally during the winter elk may be seen walking into Christiania, and even strolling about the streets; although he himself never witnessed such a scene during his visit.

Thinking it would be interesting to take pictures of the Scandinavian elk in its home, on my return to Copenhagen I stopped at Göteborg (Gothenburg).

It was on a fine, clear, frosty morning in January last when, with my camera, I entered a wood of firs and pines in search of elk. In this wood some deer are kept in an inclosure. Coming close up to the deer-park I found some young elk, and was told that one of these was very tame. This I found to be perfectly true, for as soon as the elk became aware of my presence one of them ran close behind me, and somewhat surprised me by putting its tongue to my camera.

Just then a large old elk came running past very close to me. Knowing the danger of coming in contact with an old elk, especially when not prepared for such an encounter, I jumped down on the ice of a mountain-lake close by.

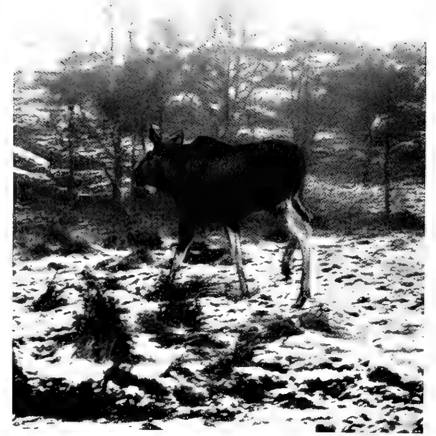
As two young elk were standing on the shore, not venturing to tread on the newly-fallen snow which covered the ice, I availed myself of the opportunity of taking several pictures.

I could not, however, be satisfied until I could obtain photographs of a larger animal.

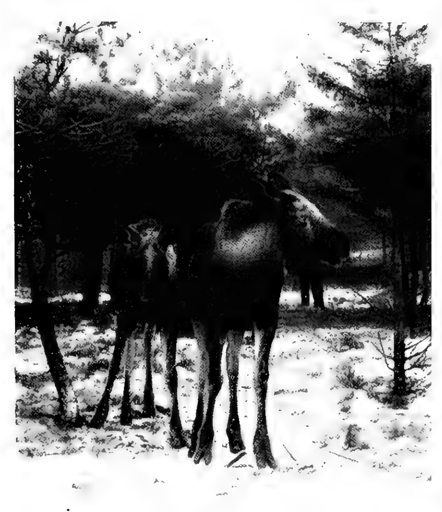
It is rather difficult and sometimes dangerous to get near a full-grown elk, on account of the animal's well-known power of kicking. Elk are known to have killed wolves by

* These, with an article on those animals, appeared in the previous number of ANIMAL LIFE.—ED.

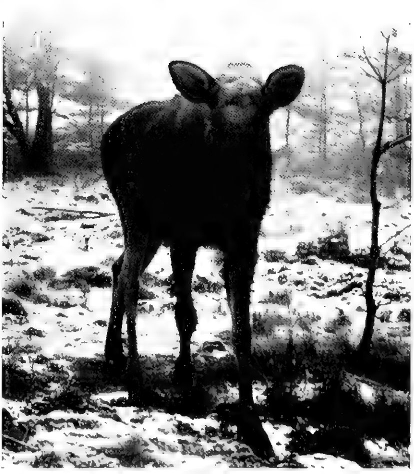
DEFENCE, NOT DEFIANCE.



HOMEWARD BOUND.



BROTHER AND SISTER.



AT CLOSE QUARTERS.

PROTECTED BY THE STATE.

a well-directed kick of their hind-feet. Before taking the photograph on this page, I had just managed to seek shelter behind a large pine tree, after seeing the animal running at full speed towards me. I succeeded, at a distance of four yards from the elk, in getting this photograph.

Later I caught sight of a big elk-cow drinking out of a hole in the ice of the lake.

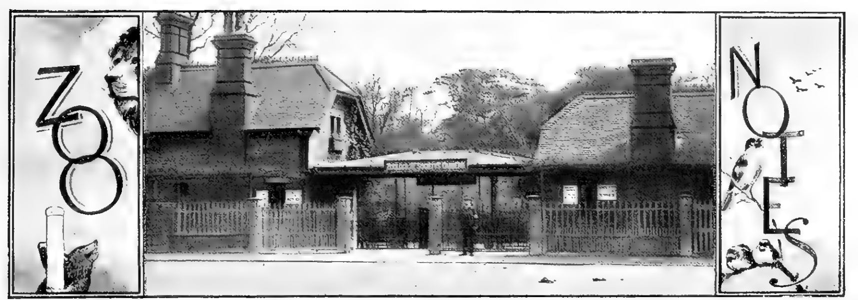
It is rather exceptional to see elk drinking water in the winter time, since, like other animals living in arctic regions, they generally eat snow instead of drinking.

On becoming aware of my presence the elk walked very cautiously towards me, as though afraid of the ice not being safe, while I at the same time advanced towards the elk. At last the distance between us was only three yards, when I took the photograph here reproduced. Frightened by the snap of my camera at the moment of the picture being taken, the cow took to her heels and ran away through the snow.

The capture of live elk is illegal unless with special permission from the King of Sweden.

Two years ago King Oscar gave orders for two young elk to be caught, as a present to the Emperor Franz Josef of Austria. Subsequently his Majesty—at the instigation of the Danish Crown Prince—permitted the Zoological Gardens at Copenhagen to procure another young animal.

It is a matter of regret that I was unable to procure a photograph of an old stag with fully-developed antlers, since at the present time much interest attaches to these appendages owing to the curious differences in form which have been recently shown to occur in those of certain individuals from the normal type. Those of my readers who desire information on this point cannot do better than consult an article by Dr. E. Lönnberg, of Upsala, lately published in the London Zoological Society's "Proceedings."



Described and Illustrated with Photographs by W. P. Dando, F.Z.S.

The Bactrian Camel.

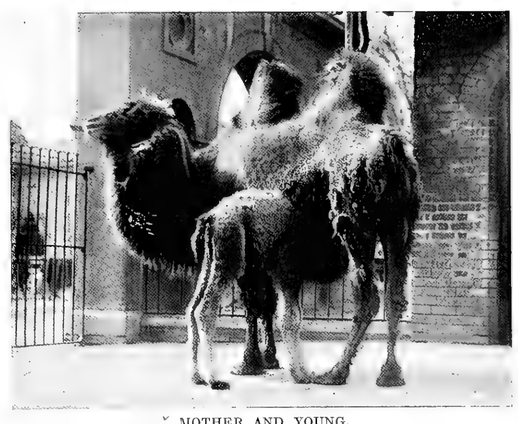
An interesting and attractive addition to the Society's collection was born in the menagerie at the beginning of April. This, I believe, is the first camel bred and born at the Zoo, although the same parent arrived in foal when deposited in the Gardens some two years ago. The young male is a very tall specimen, as can be judged by comparing his height with that of his mother; the single pose shows how "leggy" he is. The two black markings on the back of the animal are in reality the humps hanging down in the form of loose skin, which will gradually be filled out. At present they are quite loose, but when they are held up the shape of the humps can be plainly seen. The mother is a native of Siberia and is very docile; but, as Palgrave observed, "if docility means stupid, well and good; in such a case the camel is the very model of stupidity. But if the epithet is intended to designate an animal that takes an interest in its rider so far as a beast can, that in some way understands his intentions, or shares them in a subordinate fashion, that obeys from a sort of submissive or half fellow-feeling with his master, like the horse or elephant, then I say that the camel is by no means docile—very much the contrary. He takes no heed of his rider, pays no attention whether he be on his back or not, walks straight on when once set agoing, merely because he is too stupid to turn aside, and should some tempting thorn or green branch allure him out of his path, continues to walk on in the new direction simply because he is too dull to turn back into the right road. In a word, he is from first to last an undomesticated and savage animal, rendered serviceable by stupidity alone, without much skill on his

BORN APRIL 1ST, 1903

master's part, or any co-operation of his own, save that of extreme passiveness. Neither attachment nor even habit impresses him; never tame, though not wideawake enough to be exactly wild."

Lord Derby's Wallaby.

THANKS again to that enthusiastic naturalist the Hon. Walter Rothschild, an interesting species of Wallaby (*Macropus derbianus*) has been added to the already fine collection of marsupials at the Zoo. This animal is very agile, and about half the size and less than half the weight of the Great Kangaroo. It is a native of Australia, and seldom seen outside dense scrubs.



MOTHER AND YOUNG.

The Hairy-Nosed Wombat.

ANOTHER marsupial of quite a different build from the kangaroos, and resembling somewhat the form of a bear, is commonly called by the natives of Port Jackson, the Wombat. In disposition it is mild and gentle, as becomes a grass-eater, but it can bite hard, and is furious when provoked. Bass, from whom Bass Strait takes its name, gives an account of having chased one. When captured it made no noise, nor any effort to escape, not even a struggle. Its countenance was placid and undisturbed, and it seemed as contented as if it had been nursed by Mr. Bass from its infancy. This circumstance seems to indicate that with kind treatment the wombat might soon be rendered extremely docile; but let his tutor beware of giving him provocation, at least if he should be full grown. The wombat is hunted for its flesh, which is highly esteemed, and is said to resemble pork. An interesting article on this animal, by a naturalist-colonist, appeared in the March number of ANIMAL LIFE, together with some photographs of the beast in its natural surroundings.

LORD DERBY'S WALLABY.

The Antarctic Skua.

IN the left-hand corner of the Pelicans' enclosure and the right-hand corner of page 398 will be found an Antarctic Skua from the Straits of Magellan, though I am sorry to say by the time this is in print there is every probability that it will have joined the majority, for, like the gannets (lately illustrated), the skuas never live long at the Zoo. These birds (*Stercorariinæ*) form

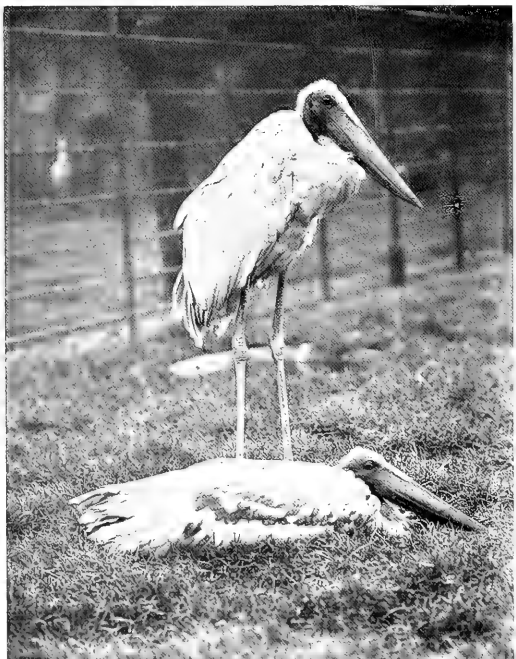
one of the three sub-families of the family *Laridæ*, the other two being *Sterninæ* and *Larinæ*. Professor H. N. Moseley, in his "Notes" made during the voyage of H.M.S. "Challenger," observes: "The Skua is a gull which has acquired a sharp, curved beak, and sharp claws at the tips of its webbed toes. The birds are thoroughly predaceous in their habits, quartering their ground on the look-out for carrion, and assembling in numbers where there is anything killed, in the same curious way as vultures. They steal eggs and young birds from the penguins when they get a chance, but their principal food here appears to be the night birds, especially the prions, which they drag from their holes, or pounce on as they come out of them. The place was strewed with the skeletons of prions, with the meat torn off them by these gulls, which leave behind the bones and feathers." The Prions referred to above are a genus of petrels, a characteristic of which is the great breadth of their bill at the base and the denticulated or serrated edges of their mandibles. No specimen of the prion is recorded as ever having been exhibited at the Zoo.

HAIRY-NOSED WOMBAT.

ANTARCTIC SKUA.

The Jabiru of Brazil.

One of the largest of the *Ciconiidæ* (storks) is the *Mycteria americana*, or Jabiru. This bird is chiefly conspicuous for the massive size of the bill, which is very slightly *retroussé* and of a deep black; it reaches down the bare neck to within a few inches of where the plumage commences, these few inches being of a pinkish colour. The black of the bill, head and neck forms a great contrast to the plumage of the bird, which should be entirely white, as in the upstanding male; the female, however, shows some dark buff feathers in the wings. The photograph of the bird in the act of eating shows the utility of the tremendous bill to these long-legged birds, four of which were presented to the Society from Pará in August last by Dr. E. A. Goeldi, C.M.Z.S.



JABIRU.

Three African Eagles.

The Eagles illustrated on the opposite page are all inhabitants of Africa. They are also all of a smaller build than other eagles, being, for example, only about one-third the size of the golden eagle.

The Cattle Egret.

The other illustration on page 399 is of the Cattle Egret. This bird is one of the large collection of Indian Birds presented by Mr. W. E. Harper, of Calcutta, and has not before been exhibited in our Gardens. Egret, or, as the French call it, Aigrette, is the common name for various species of herons which have the feathers on the lower part of the back growing in long filiformed tufts. The bird is naturally

VULTURE-LIKE EAGLE
(*Aquila verreauxi*).

WHITE-BREASTED SEA-EAGLE
(*Haliäetus albicilla*).

TAWNY EAGLE
(*Aquila rapax*).

CATTLE EGRET
(*Bubul coromandus*).

insectivorous, feeding on frogs, locusts, and particularly on worms and larvæ turned up by the plough, as well as on ticks from the backs of cattle, from which habit it takes its name.

Thrushes—Whistling and Laughing.

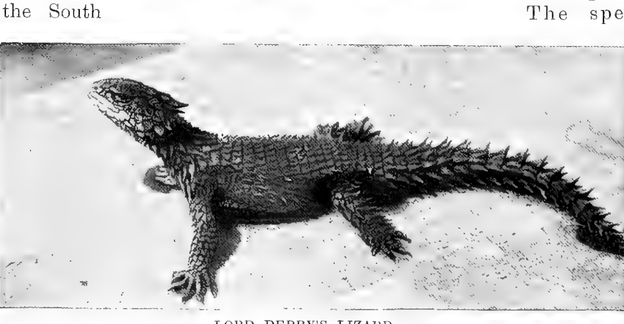
The two thrushes here illustrated are very beautiful additions to the Western Aviary, and were also presentations to the Society by Mr. Harper. The Blue Whistling Thrush (*Myiophonus cœruleus*) is a native of China, and new to the Society's collection. The Rufous-chinned Laughing Thrush (*Ianthocincla rufigularis*) comes from India. Both are very similar in build to the majority of the thrush family.

BLUE WHISTLING THRUSH.

RUFOUS-CHINNED LAUGHING THRUSH.

Lord Derby's Lizard.

Our last photograph this month is of Lord Derby's Lizard (*Zonurus giganteus*), which resembles in appearance the South African Girdled-tailed Lizard, called also by some naturalists the Shielded Zonure. The family Zonuridæ includes lizards of which some are of snake-like form, and others, like the illustration, with four fully-developed limbs. There is scarcely a stony knoll in Tropical or South Africa, or a precipice or exposed rock which does not afford a habitat for one, two, or even more of these individuals. In such situations they wander carelessly in search of insectivorous food and warmth, unless alarmed by those they regard as enemies. On being closely approached in their retreat, they seek concealment under rocks or in crevices, and when they get in such positions they are with difficulty captured, as by the prominences of their scales they can hold on with a tenacity which is quite surprising, offering such a resistance as effectually to withstand any force applied from behind to drag them out, the tail breaking off from the body before the reptile is secured. The specimens at the Zoo take up positions similar to that photographed, in which they remain for hours as immovable as the Sphinx.



LORD DERBY'S LIZARD

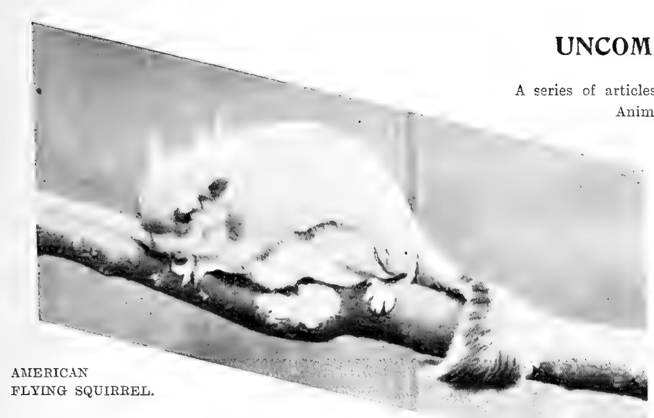
UNCOMMON PETS.

A series of articles on the Care and Keep of Animals in Captivity.

BY

P. WELLINGTON FARMBOROUGH,

F.Z.S., F.E.S., etc.



AMERICAN FLYING SQUIRREL.

VI.

FOREIGN SQUIRRELS.

SEVERAL of the exotic forms of the genus *Sciuridæ* form more charming pets and, as a matter of fact, are much more easily kept in captivity than the common English species; the only drawback is that, from their size being larger than that of the English variety, it necessarily follows that their cage must be larger as well.

There are about eleven different species of these animals which are suitable as pets, viz.: The Black Hill Squirrel, Javan Squirrel, large Indian Squirrel, Long-tailed Squirrel, Hoary-bellied Grey Squirrel, Common Striped Squirrel, Orange-bellied Grey Squirrel, Rufous-necked Squirrel, Plantain Squirrel, Grey Squirrel, Red-bellied Flying Squirrel, and the Grey Flying Squirrel.

Owing to the strong teeth and destructive habits of all the squirrel family, it is necessary that the framework should be made of some strong material, preferably T- or angle-iron; if wooden cages are desired they must be most solidly put together of one-inch material, all projecting edges being covered with tin or zinc. The wire front is best of half-inch mesh galvanized wire netting, but may be of one-eighth-inch rod iron run through three-eighth-inch-width flat cross-bars placed twelve inches apart. A retiring-box about twelve inches square should be attached to the back of the cage at the top, just under the roof, as squirrels soon mope if they cannot have a hiding-place to fly to whenever they feel disposed to hide themselves from prying eyes. In order that this box may be easily cleaned out without disturbing and terrifying the animals unnecessarily, a small door must be made in the main cage opening into this sleeping-apartment at the back or side; another door must be made opening flush with the floor of the cage proper, but must not be larger than absolutely necessary, as squirrels are very nimble creatures, and are as likely as not to be outside the cage before one is well aware of the fact. The cages for flying squirrels should be somewhat deeper than those intended for the other species of *Sciuridæ*, with dark corners for the animals to retire to during the daytime without actually using the small boxes. The bottom of the cage should be strewn with a layer of sawdust, and over this a layer of fine straw. Some people use hay as being sweeter-smelling material; but as hay has a great tendency to encourage insects, its use is not recommended. Cleanliness is a *sine quâ non* with these as with all other animals, and the cage, in addition to being cleaned out every day, must be scrubbed out every week with a strong solution of soda and water, with a free use of one of the various kinds of carbolic or other

BROAD-TAILED SQUIRREL

disinfectant soaps, in order that any unpleasant odours may be kept under, and that the cage itself may be kept clean and wholesome. If this be done regularly, no smell will be apparent and the squirrels will always be a credit to their owner; of course, advantage must be taken of the animals being in the sleeping-box to perform these operations. A portion of a tree branch may be placed diagonally in the cage leading up to the retiring-chamber. The food vessels are preferably of white earthenware.

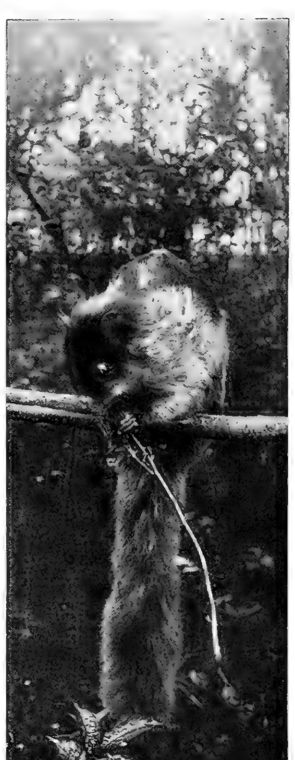
The staple diet of all squirrels should be nuts, greens, fruit, dates, bread and grains, such as corn or oats. The plantain squirrel is very partial to dates and grapes, but all species should be provided with an unlimited supply of nuts or other hard-kernelled fruits, as unless they are freely supplied with food of this nature squirrels rarely live long in captivity. Many people give food of a sloppy description, but this forms a most unsuitable diet, and the drier the food is the better; a ship's biscuit is much relished by many species; some squirrels will eat, and indeed are fond of, animal food, but this is another thing that is better avoided altogether.

One of the very prettiest of the small flying squirrels is the American species, *Sciuropterus volucella*, which, when taken young, can be readily and quickly tamed, and makes one of the most charming pets imaginable, and is said—and the writer's experience confirms the statement—to become the most tame and confiding of all wild animals in the shortest time.

Squirrels do not often suffer from many illnesses in confinement, the commonest complaint being of worms in the intestinal tracts; and whenever this state of things is found to exist, a little areca nut daily for a fortnight will be found of great benefit. Another good remedy is a few drops of oil of turpentine stirred up in about half a teaspoonful of castor oil; olive oil may be used if the other be unobtainable. It is best given in the form of an emulsion by being beaten up with the yolk of a new-laid egg; this makes it more palatable and more easily given to the animal than otherwise, as it can be spread on some small pieces of lunch or other sweet biscuit. It often happens that if there be no wood in the cage for them to gnaw at, the incisors or front chisel-edged teeth will grow to an abnormal length. In such a case, something hard must be given for them to gnaw at, such as cocoanut shells. Most squirrels die from inflammation of the lungs, and this, generally speaking, is incurable, the suffering animal only living but a short time, usually three or four days. Although

occasionally suffering from illnesses, like all other animals, squirrels, if properly cared for and taken when young, are not by any means the delicate, short-lived creatures some people would have others believe; and, strange to say, foreign squirrels are longer lived than the common British species. Possibly the plantain squirrel is the most delicate and short-lived of all species, but the other kinds all have lived in captivity for periods of from four to twelve years: the hardiest being the grey squirrel of North America and the red-bellied flying squirrel of India.

The drinking water is a matter over which all squirrels are very fussy, and they reject any that does not look and taste scrupulously clean.



INDIAN FLYING SQUIRREL.

Some people give the grey squirrel a bad name. The writer cannot agree with them; he has always, without exception, found the grey a most delightful little creature, full of quaint antics and brimming over with mischievous fun. The chipmunk, or ground squirrel of North America, is, however, a sulky, morose animal, and if touched, even when being offered a tit-bit, usually retaliates by attempting to bite the fingers of the offending person; a lady, however, described her specimen as a most affectionate pet.

Squirrels are very frolicsome by nature, besides being restless and inquisitive, and when their cage is approached, often treat the observer to a whole course of various sciurian gymnastic exercises, and, with the possible exception of the chipmunk, display the greatest affection for their owner or keeper; and many may be allowed—provided all windows and doors are closed—a certain amount of liberty in a room while there is someone there to look after them. Many are fond of playing hide-and-seek under the furniture and in the curtains, and usually baffle all attempts to recapture them until they are pleased to return to their cage of their own accord. Some specimens like to have the run of the table at meal times so as to help themselves out of the sugar-basin; if successful they scamper off with their prize, chirruping with glee.

Although squirrels get remarkably tame, they are very jealous of another member of their tribe, and only one specimen can be placed in a cage, unless it be a pair that are kept. Chipmunks are sociable, and a good many can be kept together; but with nearly all other species quarrels are sure to arise if two of one sex are kept in one cage.

All the exotic squirrels are prettily marked and are of more brilliant coloration than the English species, and this has, no doubt, led to the growing popularity of these animals as pets, for comparatively speaking they are inexpensive, cost but little to keep, and live as long as the common cat or ordinary domestic pet. Hamlyn, of St. George's Street, E., has usually a stock of squirrels of various kinds. The prices range from 10s. a pair for chipmunks up to 150s. each for fox squirrels. Twenty or thirty shillings is a fair average price to give for a pair.

TASSELLED VARIETY OF GUINEA-FOWL.

BIRD NOTES

BY

FRANK FINN, B.A., F.Z.S., M.B.O.U.,

Of the Indian Museum, Calcutta.

A Tasselled Guinea-Fowl.

THIS curious bird is a "freak" or variation of the ordinary domestic Guinea-Fowl (*Numida meleagris*). It was procured in the Calcutta Provision Market for only a little more than "killing-price." As may be easily seen, its peculiarity consists in a tassel of feathers hanging from a slight projection of the skin on the right side of the throat, about an inch before the commencement of the neck-feathering. This tassel was freely movable and swung about; the feathers of which it was composed were more than an inch long, and when spread open were seen to radiate regularly from their point of origin. In colour they were plain purplish-grey, like the feathering lower down the neck, the bird being of the ordinary or typical guinea-fowl colour, and, indeed, showing no other noteworthy peculiarity. Had the appendage grown from the centre of the throat instead of on one side, it would have had a perfectly natural appearance; so that a case like this should teach us to be careful in attributing special uses to some of the curious appendages of wild species, which may have had a similar casual origin.

Young Ring-Doves.

MR. J. T. NEWMAN'S photograph of the two young doves shows admirably their delicate appearance in the half-fledged state. The species is the well-known Tame Dove (*Turtur risorius*), often called the Ring-Dove. This is, perhaps, hardly a suitable name, as it is shared by the very different wood-pigeon (*Columba palumbus*). "Collared Turtle" and "Barbary Dove" are alternative titles for the tame bird. In these young birds the black semicircular mark on the back of the neck is not yet noticeable, while their plumage is of a paler shade than that of the parents, and the feathers have whitish tips. Although so long and thoroughly domesticated that its wild original is not known, the tame turtle-dove does not vary much in colour. The most usual type is the creamy or pale fawn-coloured bird with the black collar, such as the parents of the above pair presumably were. White varieties occur, and are called Java Doves. These usually have no collar, and when paired with the fawn birds the produce resembles one type or the other as a rule.

RING-DOVE'S NEST AND YOUNG.

Young Lapwing.

To the last picture, the one (by the same photographer) of the active young Lapwing forms an interesting contrast. The Green Plover, as this bird is sometimes called, is quite the best known of British birds of its family, and has a wide range outside our islands—right across the Old World, in fact; while it even strays to Greenland and Alaska. Very praiseworthy attempts have been made to acclimatize this pretty and useful bird in New Zealand, where it would be a highly desirable colonist if it could be established. Everyone is familiar with the lapwing's "prayerful cry," which has given it names in several languages—*Peewit* in English and *Kiebitz* in German, for example. The bird has also been long notorious for the artifices it practises to decoy intruders from its young, skilfully feigning a broken wing on such occasions. Perhaps this is what Chaucer alludes to when he speaks of "the false lapwing, full of treachery." Later than Chaucer, however, the lapwing proved really treacherous to the hunted Covenanters by mobbing them when in hiding, and thus betraying them to their persecutors. Young lapwings, as most people know, run at once, but they attain a considerable size before they are able to fly; and when fledged they may be distinguished from their parents by having their glossy bronze-green upper plumage tipped with yellow. Although the lapwing is a good bird for the table, it seems a shame to kill for food a bird so useful to the farmer and so ornamental, when it also supplies a far greater delicacy in the shape of the well-known "plovers' eggs."

❧

The Bearded Reedling.

The pretty little long-tailed bird shown in the accompanying illustration (a photograph by Mr. C. N. Mavroyeni, of Smyrna) is the hen of the Bearded Reedling (*Panurus biarmicus*), often incorrectly called the Bearded Tit. The photograph gives a good general idea of the bird, but unavoidably fails to do justice to its colour, which is of a beautiful warm buff over most of the plumage. The male bird is distinguished by a French-grey head and a pair of long black tufts at the corners of the mouth, ludicrously like moustaches. The young cocks naturally enough start life without these appendages. The reedling is not a migratory bird, but has a wide range, being found through most of Europe, and as far as Central Asia. It inhabits marshes, climbing actively among the reeds, and feeding on their seeds and on small insects and snails. It builds an open cup-shaped nest of grass lined with reed flowers, and the eggs are creamy-white with blackish markings,

YOUNG LAPWING.

THE BEARDED REEDLING.

quite unlike a tit's. The reedling is a most sociable bird, being always found in pairs or flocks according to the season, and in captivity the affection the pairs show for each other is most touching. Unfortunately, the reedling is now very rare in England, being restricted to the Norfolk Broads, where, like most rare birds, it is of course in danger from collectors. The fact, however, that it is now fairly easy to obtain alive — specimens were recently advertised at ten shillings a pair—makes it possible to hope that suitable localities may be restocked with foreign specimens, as was done in the case of the capercailzie when that grand bird became extinct in Britain.

The Mallard.

MANY people will be inclined, with M. Gabriel Rogeron, the author of an admirable work on ducks as fancy birds, to consider the true wild Mallard (*Anas boschas*) as one of the most beautiful of all ducks, his fine proportions being admirably set off by unusually rich plumage, which we hardly appreciate as a rule because it is so familiar. Yet there are few pieces of colour in nature so rich as the plushy metallic-green of the mallard's neck, and the rest of his plumage is most beautifully harmonised. As anyone may see, however, in such places as the London parks, where the birds breed freely in a protected condition, the mallard shows a strong tendency to depart from his original pattern, to the detriment of his beauty. Many birds lack the beautiful chocolate breast of the wild bird; in others this brown colour is exaggerated, and runs cloudily along the flanks; while in a third variety all the splendid metallic tints are wanting, and the pattern of the plumage is reproduced in a grey monochrome, only the brown of the breast remaining. These glossless birds, and also the grey-breasted ones, are not rejected by the females, as may be seen in Regent's Park, where some are successfully paired, wives among the park ducks apparently going to the strongest. The wild mallard, as may be seen by the Smyrna specimen in Mr. Mavroyeni's photograph, is very much the same everywhere, and it has a wide range, including the northern hemisphere generally; American specimens are particularly large and fine. It is interesting to note that the variations of colour above alluded to are repeated in the tame ducks of India, living in a climate in which the wild race never breeds.

MALLARD AND DUCK.

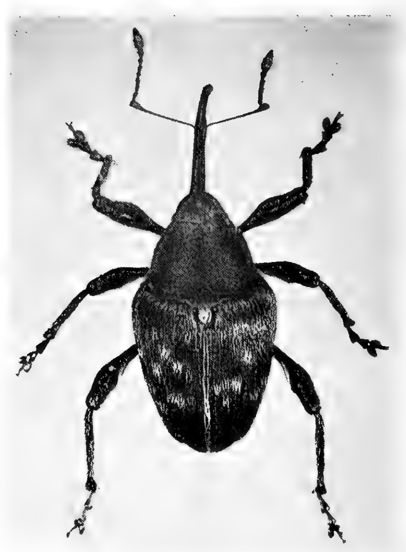
The Jack-Snipe.

The Jack (*Limnocryptes gallinula*) is about the smallest of the snipes, the largest being the Brazilian Giant Snipe (*Gallinago gigantea*), which is even larger than our woodcock. The jack-snipe makes up for his small size by being exceedingly good eating and hard to bring to bag. It is of a jack-snipe that the well-known story is told about the sportsman who was an indifferent shot, and was found lamenting over the corpse of a snipe which he had killed. Asked the reason of his grief, he replied that he could always find that bird at about the same place and have a morning's practice at it, but now it had managed to get in the way of the shot, and his harmless recreation was at an end. This little snipe's agility avails him against other than human foes also, for in a recent number of the "Ibis," Mr. W. Jesse, a well-known Anglo-Indian observer, states that he saw one pursued by a pair of Jugger falcons (*Falco jugger*), two kites, a tawny eagle, and two other birds of prey, and then escape. Truly a case of high, low, Jack, and game!

THE JACK-SNIPE.

The hen of the Jack—which, I suppose, should be by rights the "Jenny" snipe—is remarkable for the great size of the four eggs she lays, the weight of this clutch coming within half an ounce of her own. Unlike the common snipe and the woodcock, the bird does not breed with us, its nesting-grounds being in Scandinavia and Siberia, whence it migrates southwards in winter, having on one occasion even been reported from the Andaman Islands. This, however, was abnormal, and as a general rule it does not go so far south as the common snipe. In addition to its small size, the half-snipe, as the jack is sometimes called, may easily be distinguished from the common or full snipe by the absence of the central buff streak down the crown, only the two side ones being present, and by its pointed tail-feathers, as is well shown in the photograph, for which we are again indebted to Mr. Mavroyeni, of Smyrna. It also has a beautiful green and purple gloss on the back. There are no true jack-snipe out of the Old World, the American birds sometimes so called being really sandpipers. Snipes and sandpipers, however, all belong to the same family, though the former are easily recognisable as a natural group or genus within it.

HAZEL NUT. (Natural size.)
Showing the hole through which the grub of the Nut-Weevil has made its exit.



THE SPOTTED NUT-WEEVIL
(Six times natural size.)

SOME BRITISH NUT-WEEVILS.

By JAMES EDWARDS, F.E.S.

ON cracking a hazel nut, whether it be the wild product of our woods and hedgerows or the more civilised filbert, one not unfrequently finds in the inside the partly-consumed kernel and a short, fat, yellowish-white maggot with a brown head and no legs. Despite the unattractive appearance of this seemingly helpless object, its history is not without interest, for it will, in the ordinary course of events, one day change to a full-grown beetle—a Nut-Weevil. We have in this country several kinds of nut-weevils, so-called on account of their general resemblance to the Mottled Nut-Weevil, which may be regarded as the nut-weevil proper; and three of the more frequent of these kinds have been selected for our illustrations. The latter represent the beetles at six and nine times their natural size respectively. With the majority of our native insects it is necessary, in order to get a correct idea of their form, to view them through a lens of some kind; an inexpensive pocket-lens is in most cases amply sufficient. It is one of the many charms of photography that it enables us to represent accurately the appearance of these small objects when viewed with a magnifying-glass. The Spotted Nut-Weevil is perhaps the commonest of all the kinds found in this country; it occurs on hazel-bushes, both wild and cultivated. In colour it is dark yellow-brown, with somewhat roundish pale spots on the wing-cases. The Mottled Nut-Weevil, which is of a reddish yellow-brown, mottled on the wing-cases with a paler tint of the same colour, is found not uncommonly on oak trees; its grub lives in acorns. The Banded Nut-Weevil also lives on oaks; it is considerably smaller than the two preceding, and is black, more or less sparingly clothed with whitish-grey

scales, and has a conspicuous V-shaped or transverse whitish marking on its wing-cases behind the middle. The life-history of these insects is, briefly, as follows:—Whilst the nut is young the female weevil eats a hole quite through to the middle of it. This she has no difficulty in accomplishing, because her jaws are placed at the tip of her long beak; and, lest the pair of feelers which she carries near the middle of the latter should be in the way whilst she is engaged in this and similar operations, they are made to double in half and fit in a pair of grooves on the lower side of the basal half of the beak. In the hole thus made she lays an egg, from which, in due course, a tiny maggot hatches out and proceeds to consume the kernel of the nut. The maggot, when full-fed, changes to a pupa or chrysalis under the surface of the ground, and, in order to get there, eats its way out through the nutshell, leaving a clean-cut roundish hole of the kind shown in our illustration.

Sometimes this happens whilst the nut is still on the bush, but more frequently it does not occur until after the nut has fallen. When the maggot has assumed the chrysalis state it resembles the perfect beetle in form, but is whitish in colour and quite incapable of movement, the limbs being doubled up and packed close to the body. In the early summer the beetle leaves the pupa-case and makes its way to the surface of the ground, and thence to the tree or bush which is in due course destined to become the food-plant of its offspring. When at liberty these beetles display an amount of activity which seems quite out of keeping with their short squat bodies and long sprawling legs. In the sunshine they run very rapidly, and readily take flight. Their foothold, too, as indicated by their widened and hooked feet, is so good that it requires a comparatively large amount of force to dislodge them from an object they may happen to be traversing.

THE MOTTLED NUT-WEEVIL.
(Six times natural size.)

THE BANDED NUT-WEEVIL.
(Nine times natural size.)

NOTES AND COMMENTS.

The Fan-tailed Squirrel.

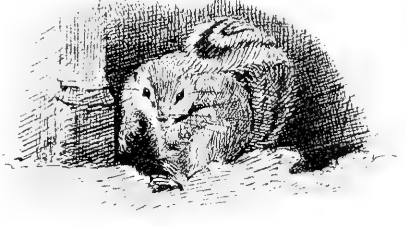
THE HON. ALICE FOLJAMBE, whose original painting of her pet squirrel is reproduced as a frontispiece to this number, has also supplied us with the following notes and the accompanying illustrations: "The Ground, or Fan-tailed Squirrel is a native of South Africa, where it lives in holes which it scoops out among the rocks. The specimen in my possession was caught near Kroonstad, in the Orange River Colony, and I have had him since last July. His length, from the nose to the tip of the tail, is eighteen inches, of which the tail occupies one-half. Its head is like a marmot's, the ears being externally mere slits; but the stripes on its sides remind one of the ground squirrel of North America. The eyes are large and black, the head and upper parts reddish-brown, slightly tinged with grey. There is a white stripe on each side, extending from the shoulder to the thigh, below which is a broad streak of chestnut fading into cream on the under-parts, where the fur is longer and softer than above, it being somewhat harsh and scanty on the rest of the body. But its chief glory is its tail. Reddish at the base, it becomes greyer towards the tip. The outside edge is creamy white; then comes a band of black, specially broad and deep at the tip, and the centre is beautifully variegated with black, reddish and white. When asleep the tail is curled round over the head; when running it is usually kept carefully off the ground. Sometimes it is arched over the back somewhat after the fashion of our English squirrel, and it can be curled over, with every hair erect, in a peculiar manner which irresistibly reminds the spectator of a fan, whence its popular name. This beautiful appendage is most carefully looked after, being taken in the two front paws and thoroughly cleaned from end to end. 'Jacky,' or to give him his full name, 'John Vanderpomp,' is a most affectionate little animal, gentle as a pet dog to his mistress, and will allow himself to be pulled about and played with, without any attempt to use his teeth, which, as I know from former experience, are pretty sharp. He lives in a large tin-lined cage with a wire run 3 feet long by 1½ feet wide; it is built on wheels, and has even then to be raised off the ground if the latter be at all moist, as, though he does not require any great heat, being accustomed to so dry a climate the slightest

THE FAN-TAILED SQUIRREL.

Some Characteristic Poses.

THREE MORE—

damp is injurious to him, and would give him stiff legs or rheumatism. During most of the day he has the run of the green-houses (in one of which his cage is kept), where he thoroughly enjoys himself, and speedily made himself a hole in a corner by the hot-water pipes. Here he will sleep, curled up in a ball, as often as not on his head. His food is Indian corn, also wheat, barley, and all sorts of grain, and he will eat biscuits and small nuts, almonds, sultanas, etc.; but his great treat is ginger-bread in any form, over which he is most desperately greedy. He will get on my shoulder, when I am sitting on the ground, in order to get a better view of any possible hiding place for the dainty, and will try and force open the tin from which he has seen me take it. The only green food I have ever been able to persuade him to eat is green peas, and these he soon became very fond of; he had to be taught to open the pods, and I shall be curious to see if he remembers this next summer, as it was evidently quite a new idea to him. He is certainly possessed of some memory, as, if taken back to a place he has not visited for many weeks, he makes at once for his old play-places, and remembers all the objects that interested him before. Though tolerably active when awake, his chief pleasure in life seems to be (next to gingercake) sleep. He is not a nocturnal animal, but is always ready for a slumber if anyone will be so kind as to place their lap at his disposal. To see him rise from his bed in the morning with many yawns and walk all round his cage stretching himself is most ludicrous. Recently a stock dove, recovering from a broken wing, came to share 'Jacky's' greenhouse. They were both let out for a walk together. 'Jacky' stood up on his hind legs and stared long and fixedly at the new-comer. The pigeon sat sulky, and evidently thought him rude.. But when 'Jacky's' curiosity led him closer, he was repulsed with loud hisses and violent pecks in his direction. Now 'Jacky' ignores the pigeon's presence, but if he goes too close the latter's wrath is instantly aroused. Altogether the fan-tailed squirrel is a most charming pet, and only needs to be wider known to become a universal favourite. He is easily tamed and very intelligent, and



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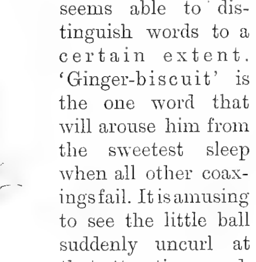
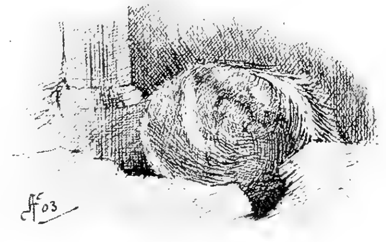


seems able to distinguish words to a certain extent. 'Ginger-biscuit' is the one word that will arouse him from the sweetest sleep when all other coaxings fail. It is amusing to see the little ball suddenly uncurl at that attractive sound. He answers to his name and is fairly obedient, though he has quite sufficient sense (!) to wait till no one is looking and go back to his little sins. He never utters except to show annoyance by a squeak, or terror by a succession of sounds curiously like a fit of human sneezing."



—THE FAN-TAILED SQUIRREL.

The Ghiza "Zoo."

"R. L." writes:—"Under the careful superintendence of Captain Stanley Flower (a son of the late Director of the Natural History Branch of the British Museum), the Zoological Gardens at Ghiza, near Cairo, are making rapid progress, a special feature of the present management being the display of as many representatives as possible of the African fauna. Giraffes are now living in the Gardens, where they ought to breed and form a herd from which European menageries could be stocked; and there are several representatives of the antelopes of the northern districts of Africa. From the mountains of Upper Egypt comes the remarkably fine specimen of the Nubian Ibex (*Capra nubiana*) represented in the illustration on the opposite page, which, together with the one of the Nuer Ox, is reproduced from a photograph taken by Mr. Hansard, of the Egyptian Public Works Department, and sent to the writer by Captain Flower. Unfortunately, the length of the horns of the Ghiza specimen of the ibex is not given, but they appear to be unusually large. The maximum length at present recorded for the species is fifty inches. The Nubian ibex, which also occurs in Arabia, and probably extends westwards into Morocco and Senegambia, differs from both the European and Central Asian species by the comparative slenderness of its horns, as well as by the marked bevelling of their outer front angle. The Nubian ibex and the larger and darker Abyssinian species (*C. vali*) from the highlands of Simien are of especial interest as being the sole wild representatives of the goat tribe in Africa; and it is important to remember that both are confined to the northern part of the continent, to which they are in all probability comparatively recent immigrants from Asia.

NUER HUMPED OX.

"A feature of Captain Flower's superintendence of the menagerie at Ghiza is that domesticated animals are (as they should be) included among the exhibits. Among such specimens is a very remarkable breed of sheep, so like a hornless goat that by most persons it would be so classed, although it possesses certain features which appear to support its right to be classed as a sheep. The Gardens also contain specimens of the curious black-headed or Hedjaz fat-rumped sheep, of which Captain Flower has recently presented a specimen to the British Museum. The handsome animal represented in our illustration on this page is called by Captain Flower the Great Nuer Ox. I am not aware from what part of the country it comes, though it is probably a native of the Sudan. It is evidently one of the numerous breeds of humped ox, which probably originally came from Asia, although they are now widely spread in Africa. Compared with those of the Indian breeds, the horns of the Nuer ox are very much larger, and in

this respect they approximate to the Galla ox, in which these appendages attain their maximum development.

"Much interest attaches to the presence in the Ghiza Gardens of specimens of the Whale-Headed Stork (*Balœniceps rex*), which were brought down with some difficulty from Khartum, where they inhabit the great papyrus brakes of the Nile swamps. In the sixties some of these great birds were hatched from eggs at Khartum by Mr. Petherick, then British Consul in the Sudan; and some of them arrived safely at our own 'Zoo.' Since their death the only specimens brought alive out of the Sudan are those at Ghiza, although there is an example living alone at Khartum. A skin of the Shoe-Bill, as the species is often called, from East Africa, was presented some time ago to the British Museum by Sir Harry Johnston, and four excellent photographs from life of a specimen in the Cairo Gardens were reproduced on page 159 of this volume.

"One other feature of the Ghiza 'Zoo' must receive brief mention. This is an aquarium devoted to the exhibition of as many species as possible of the fishes inhabiting the Nile system. At the present time a very large number of species—including the curious enamel-scaled Bichir, with its long row of sail-like finlets down the back, and its lobate and fringed fins—are living in the tanks; and as others are obtained, it is hoped that much additional information will be gathered in regard to the fish-fauna of the Nile."

A FIFTEEN-DAY-OLD INDIAN ELEPHANT.

NUBIAN IBEX IN THE GHIZA "ZOO."

A Baby Elephant.

THE other photograph on this page is of a young elephant and its mother, which has been sent to us by Mr. A. E. MacAulay-Audsley, of Calcutta, who took the picture in the Zoological Gardens of that city, where the calf was on view, and where it proved a great centre of attraction to the crowds of people who daily went to see it, as no doubt the one born in our own Gardens would have been had it lived. Mr. MacAulay-Audsley writes as follows concerning this interesting picture:—"For the past few days the Zoological Gardens here have displayed the additional attraction of a baby elephant. The term 'baby' is often incorrectly applied to hobbledehoy elephants aged a few months, or even a few years; but this recent visitor to the 'City of Palaces' is absolutely the very babiest elephant that most people have ever been privileged to see. At the time the photograph was taken he was only fifteen days old, and bore a most bewitching likeness to a full-grown elephant viewed through the wrong end of an opera glass. The baby was born on board a flat* between Assam and Calcutta. The hide of the pachyderm never presents a youthful appearance, and this fortnight-old baby was

* A sort of large flat steamer used on the River Hoogly for the Assam Service.

probably explaining to him at the same time that the world was a very dangerous place, for he would stand underneath her, gazing out pensively until the impression passed and he was ready for new perils. It was a most difficult task to get him in position for the camera, for even when he appeared to be making for a certain spot he would stop on the way and play football with his trunk; it was as interesting to him as a kitten's tail is to a kitten, but far more puzzling. He seemed always to be wanting, as the song says, 'something to play with,' and sticks, parasol handles, etc., were his delight. The baby and its mother are now on a voyage to Europe (Hamburg), and I feel sure that no ship will be dull that numbers him among its passengers."

The Phu-Quoc Dog.

THROUGH the kindness of the Marquis de Barthélemy and Mr. H. C. Brooke we are enabled to give portraits and a description of a breed of dog which is of great rarity and very little known, and of which, we

upholstered in worn, rubbed, dingy leather which appeared to have seen as much service as his anxious and attentive mother. Only his large bright eyes, his little futile trunk, and an occasional unexpected, and to him most surprising, sprawl of his shambling hind legs denoted his exceeding youth. The mother was very careful not to let her baby beyond the reach of her trunk, though she was tethered fore and aft, while the baby was free; but her long reach never failed to bring him back into safety,

TWO PHOTOGRAPHS OF THE PHU-QUOC DOG.
(No living specimen of this animal has ever entered England.)

SPANIEL PUPPIES AND THEIR FOSTER-MOTHER.

believe, no living specimen has ever entered England. This is the Phu-Quoc dog, which derives its name from the Island of Phu-Quoc (Cochin China), where the Marquis holds a concession from the French Government. Since the French conquest the Phu-Quoc has become very rare in his native land; and despite the extraordinary facilities enjoyed by the Marquis de Barthélemy, it is with difficulty he has been able to procure his specimens of the pure breed. He considers that there exist in all Europe but three Phu-Quoc dogs—Can Lé and Pek-Te II., mother and son, the subjects of our illustration, and a dog now at the Paris Jardin d'Acclimatation, with whom it is hoped successfully to mate the bitch this year. Another specimen owned by the Marquis—Pek-Te I.—unhappily died last year from exhaustion after giving birth to twelve dead pups. The Phu-Quoc is a well-built, strongly made and active dog, with very powerful jaws. In colour it is brown, and our illustration of the brace, held by the Marquis's keeper, gives a very good idea of the size of the breed. A great peculiarity of the pure Phu-Quoc of unmixed lineage is that the hair on the back, instead of growing in the usual way, points towards the head of the dog.

Curious Animal Friendships.

We give on this page two photographs illustrating queer animal friendships. Curiously enough a hen figures in both. The first, sent to us by Mr. Newman, of Berkhampstead, represents a farmyard fowl acting as foster-mother to a litter of spaniel pups, whom she insisted on adopting, devoting herself to their comfort for hours at a time. The second is a picture of Mrs. Brooke's imported Dingo "Myall," with his favourite chicken, a queer pal for this usually somewhat bloodthirsty animal. "Myall" is the sire of "Chelsworth Myall," whose portrait we gave on page 160. He was a very well-known prize-taker; he was perfectly broken to ferrets and an excellent ratter, but he would go nearly frantic at the sight of a sheep, on one occasion killing eleven in about as many minutes before he could be recaptured.

"MYALL" AND HIS PET CHICKEN.

Fox Cubs.

Mr. Eardley H. U. Draper, who has sent us the interesting photograph reproduced on this page, writes as follows: "This photograph shows three Fox Cubs about five days old. They were born in the bottom of a deep dry ditch, and were found by a keeper, who showed them to me. It was with great difficulty that I managed to photograph them, as the place was dark and thickly covered with brambles, but I was determined to get them in their natural position. The keeper explained their being born above ground as due to the fact that all the available "earths" about were already occupied (this he knew as a fact). The shape of the cubs' heads showed very little resemblance to that of the mature fox, but was far more like the head of a pug puppy. Their eyes were not then opened, and the length of their bodies was not more than six or seven inches. The vixen moved them within twelve hours of my visit." As the pages of this magazine have always been open to any notes on hybridism, it may be of interest to say here that among those who believe that the fox will interbreed with the domestic dog are Mr. Trevor-Battye and Mr. W. E. de Winton, both of whom cite instances which have come to their knowledge of such unions; on the other hand some of those who are well qualified to give an authoritative judgment on the subject, say such unions are quite unknown. Perhaps some of our readers will have something to say on the subject.

FOX CUBS, FIVE DAYS OLD.

End of Vol. I.

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THROUGHOUT THE WORLD

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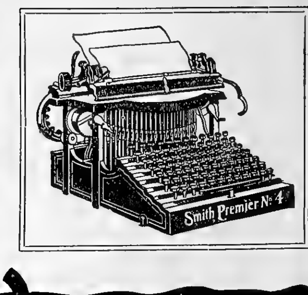

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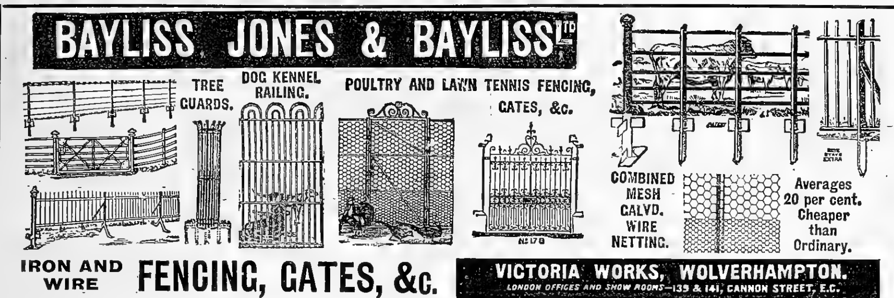

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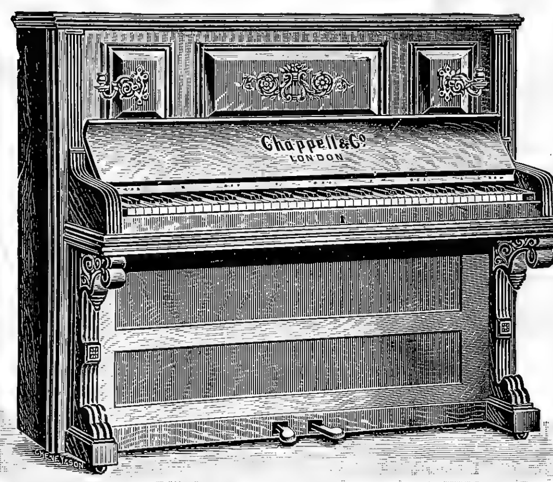

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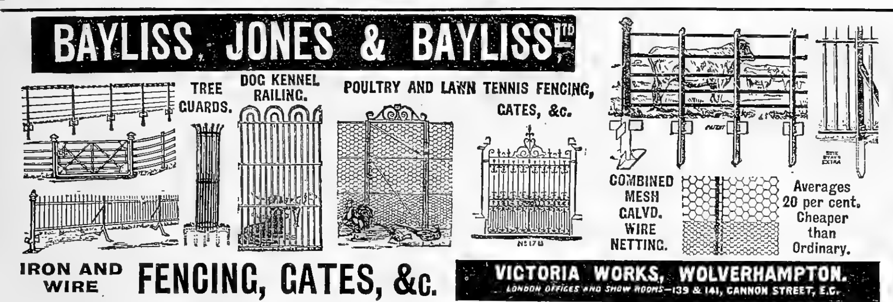

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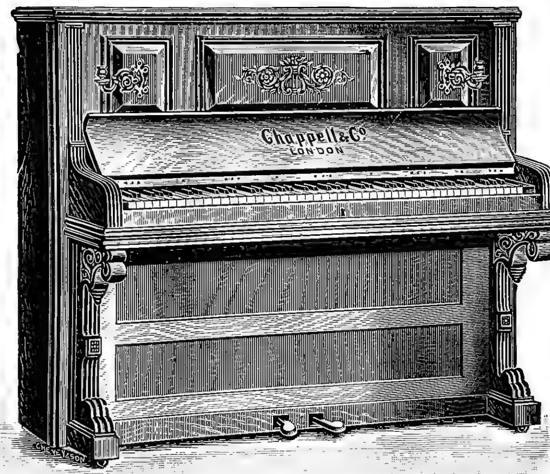

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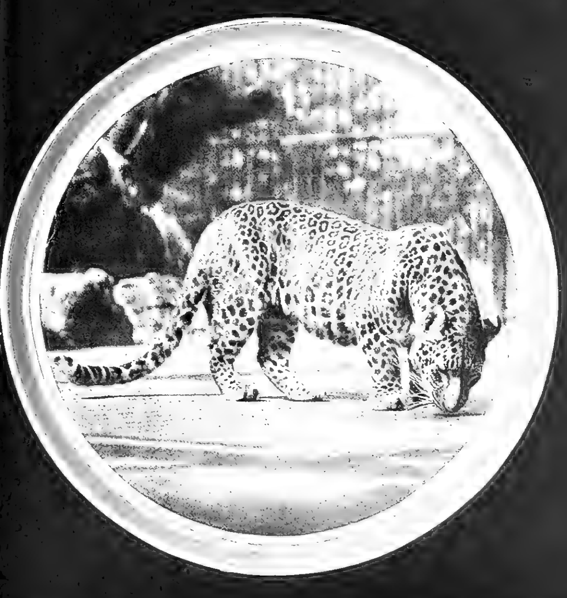

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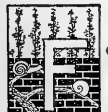
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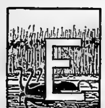
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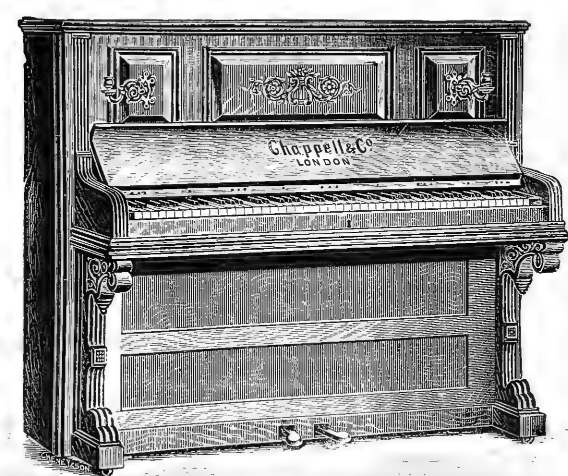

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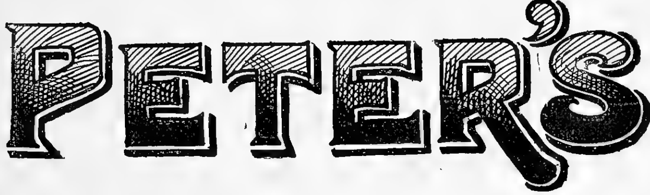

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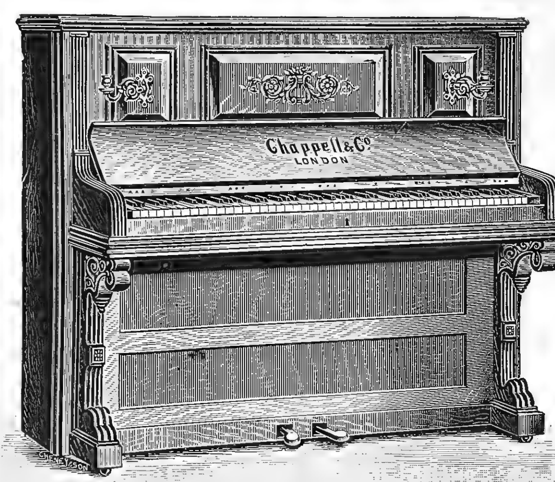

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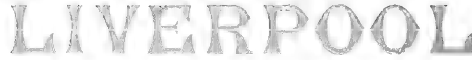

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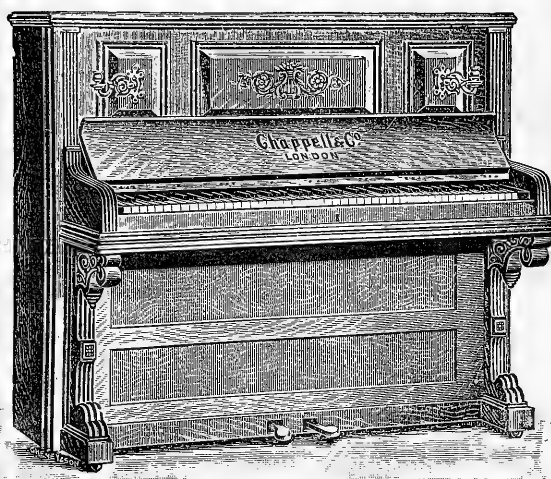

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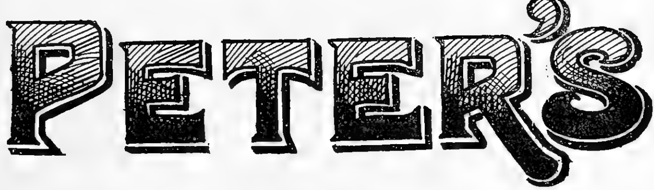

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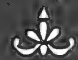

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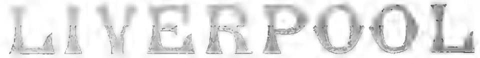

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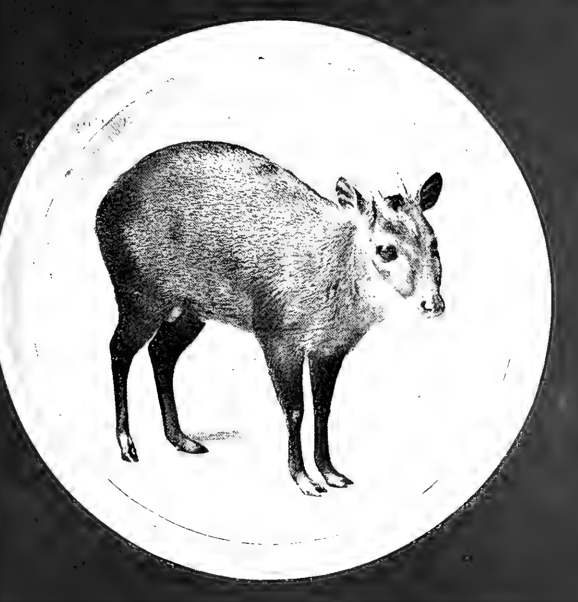

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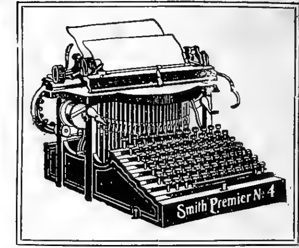

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ANIMAL LIFE

And the World of Nature.

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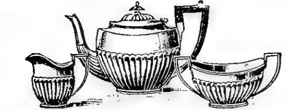

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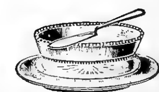

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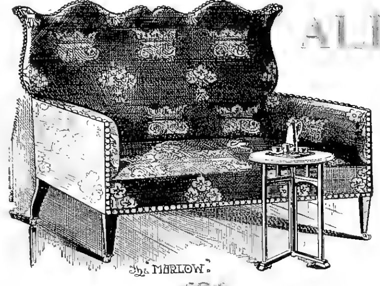

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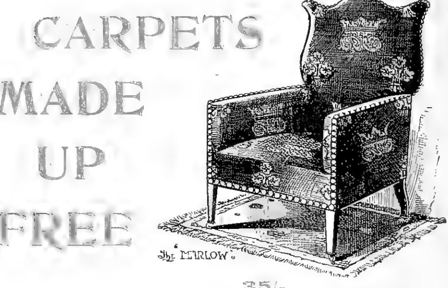

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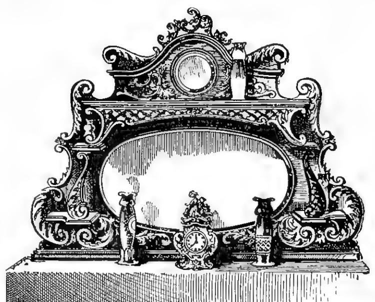

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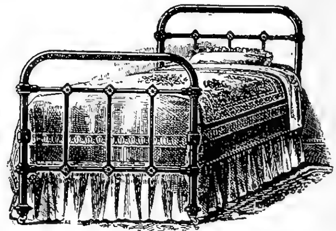

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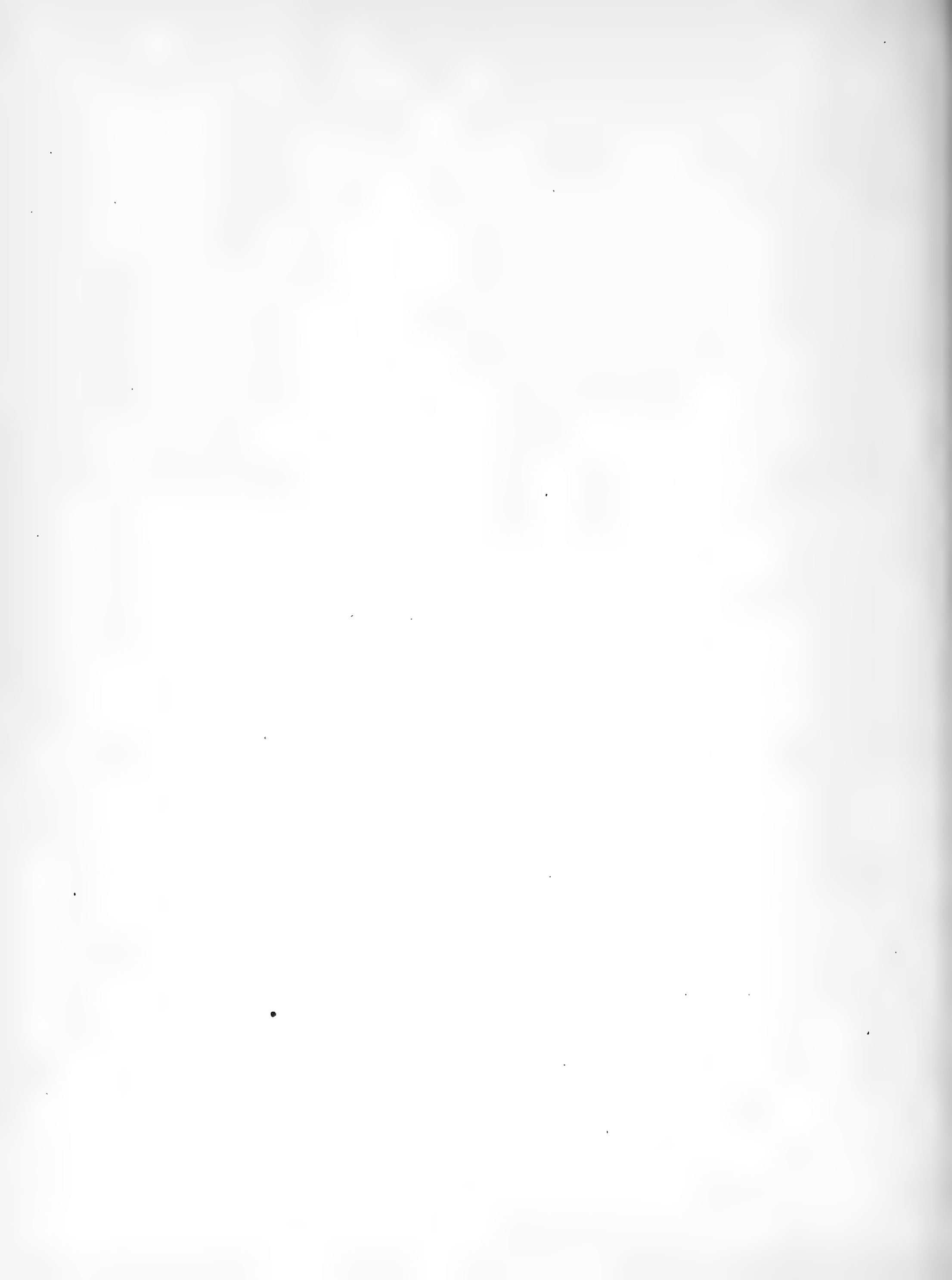

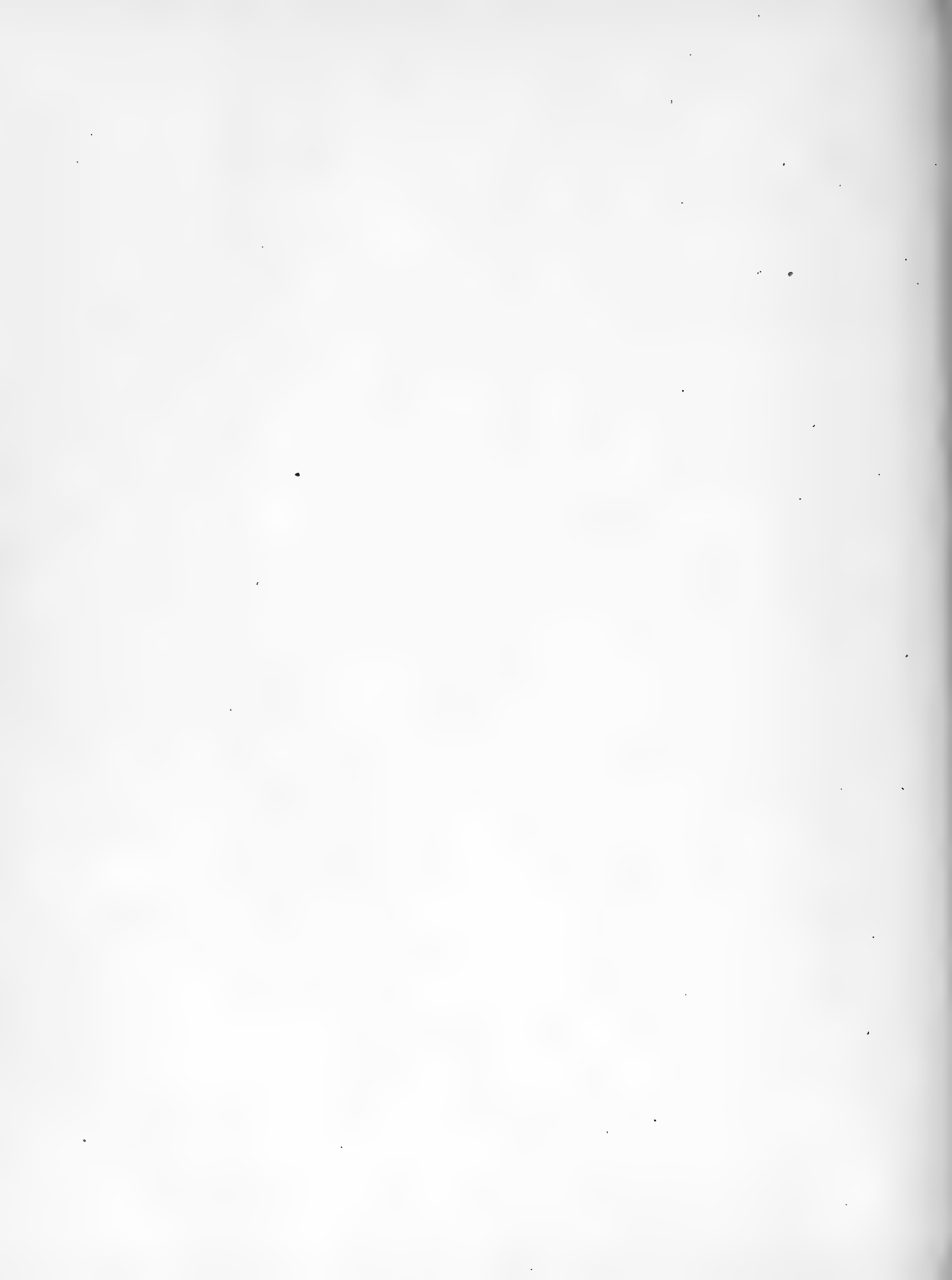

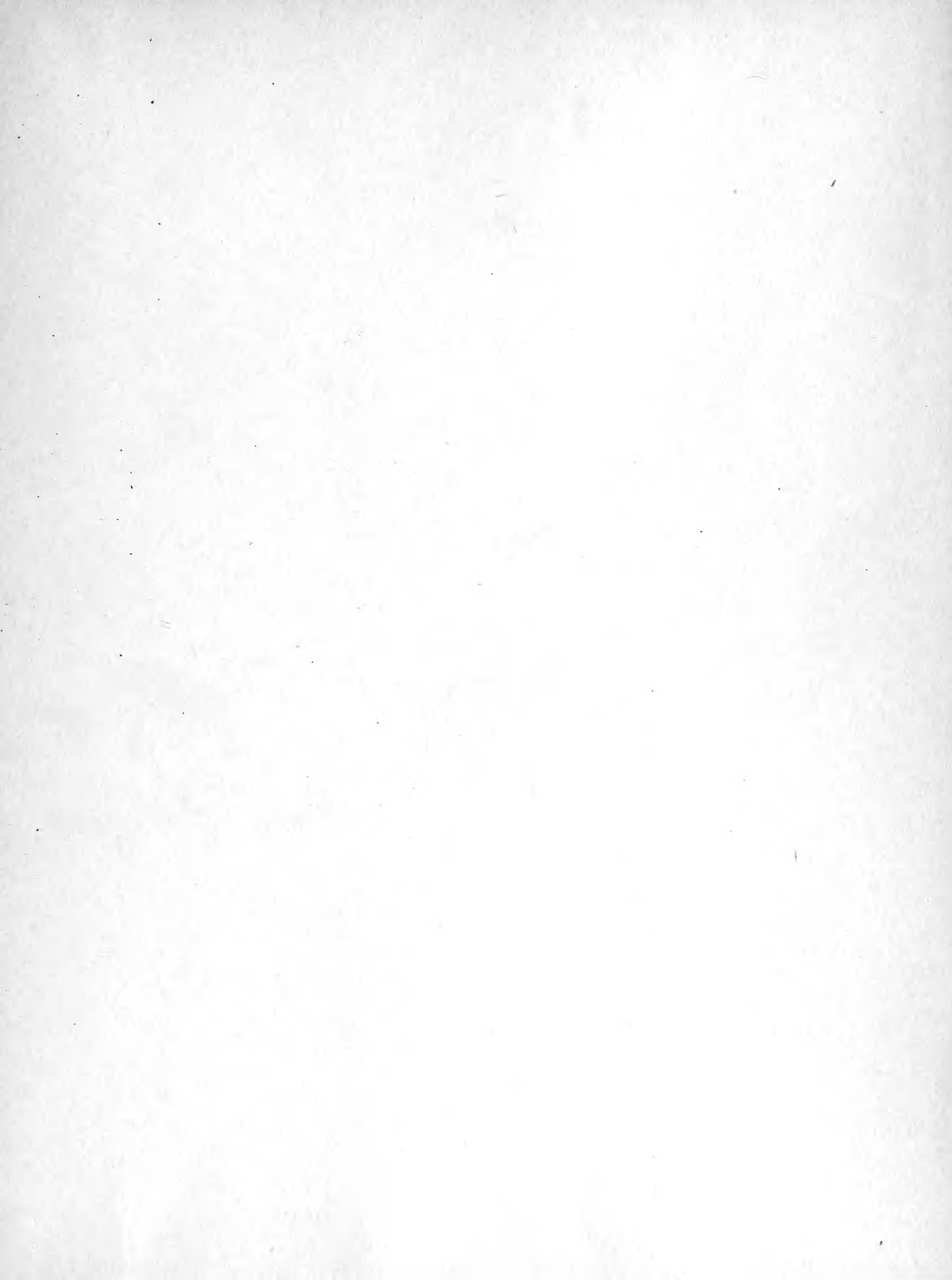

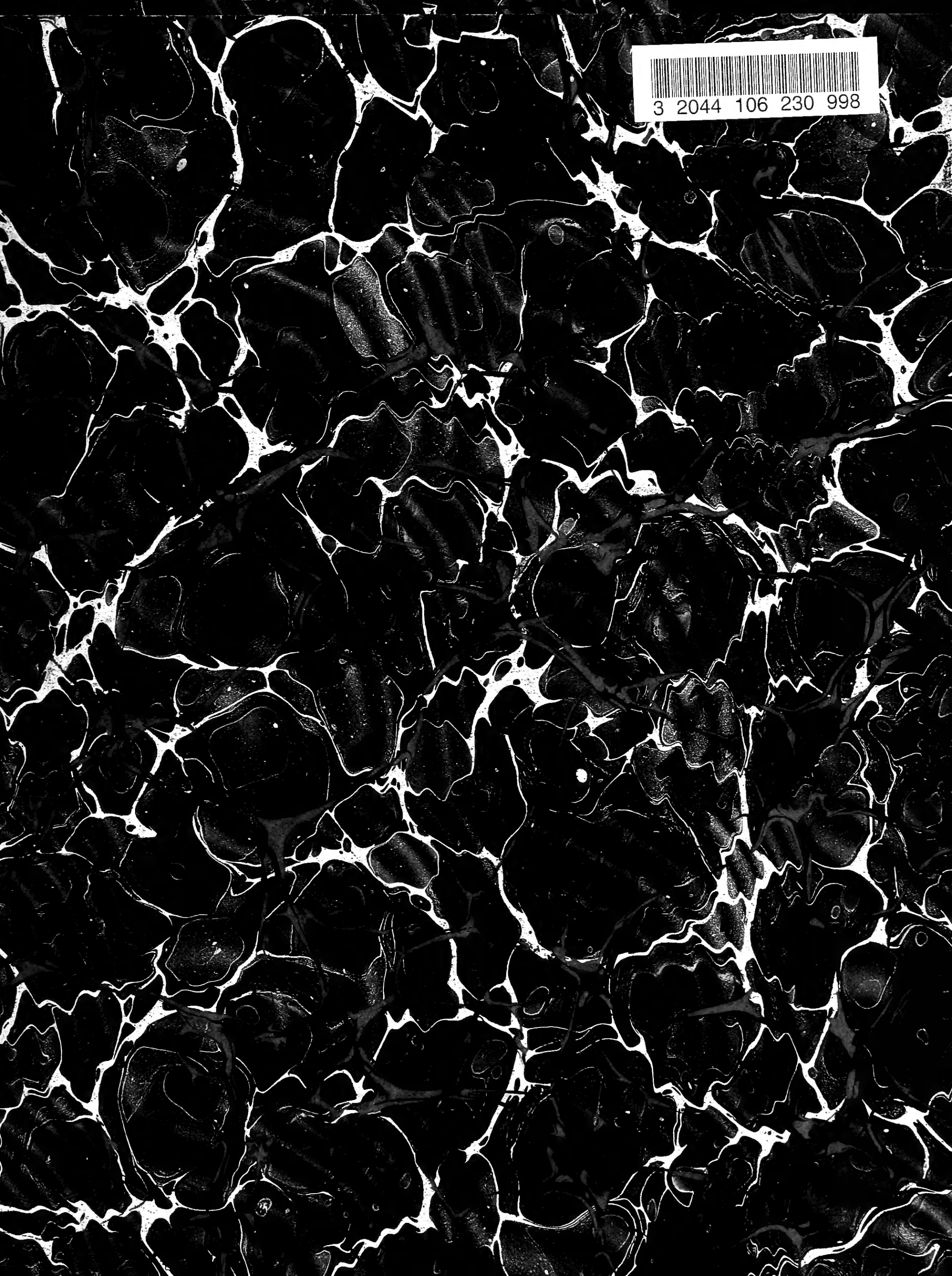
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