ANIMALS OF EAST AFRICA

C. A. SPINAGE

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With a foreword by
Sir Julian Huxley, F.R.S.

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Foreword by Sir Julian Huxley

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This is indubitably the best collection of wild life photographs that I have ever seen, combining beauty, interest and technical excellence in an outstanding way.

The photograph of Flamingos on Lake Nakuru at dawn is of such sheer loveliness that it brought tears to my eyes, while a number of others admirably combine beauty and interest, like the Lioness suddenly sighting her prey, or the Reticulated Giraffe erect in its velvety elegance.

Perhaps the most remarkable of the lot is the panorama of elephants majestically moving through a landscape of Candelabra Euphorbias: it reveals the essential nature of the African Elephant, dignified, unhurrying and assured, and also the fascinating quality of the African landscape. (The Elephant is not always dignified and unhurrying, however; another remarkable photograph shows an angry and terrifying tuskless cow charging the photographer.)

Another aspect of African wild life is beautifully shown in the photograph of Topi and Uganda Kob. Of all the antelopes, Topi perhaps provide the best impression of the abundance of wild life on the great game-plains. Their grazing herds are not so large as those of the Wildebeest, but they are less scattered; nor are they too densely massed, like those of Wildebeest on migration, nor unduly small, like those of Impala.

For a combination of interest, rarity and technical excellence,

I commend the two photographs of that extraordinary and elusive creature the Gerenuk, the long-necked antelope which is halfway to a giraffe, browsing high, reared up on its long hind legs.

In the category of unusual scenes, I would draw attention to the Lion and Lioness forced out of their pleasant laziness by the approach of a blundering Rhino: the Lioness dragging away the newborn Wildebeest calf she has just killed: Gertie, the famous Rhino of Amboseli, browsing on prickly shrubs: and her two offspring, one congenitally lacking ears. Then, there is the extraordinary series showing a duel between two bull Giraffes, each attempting to strike its horned head sideways against the other's flank or belly: the young Zebras for some unknown reason snuffing at a patch of soil: the Crocodile seen from above, limbs pressed close to its side, quietly swimming past an unafraid group of fish: the group of inquisitive Rock Hyrax peeping at the camera: the Clothes-moth larvae which live on the keratin of dead animals' horns instead of on wool: the charming baby Bat-eared Foxes: the Marabou and the Vulture waiting for a dead Hippo's skin to burst: the Rhino rolling over on its side because that is the only way in which it can lie down to rest. . . .

Nor must I forget the text, over which Mr. Spinage has clearly taken a great deal of trouble, and which is full of interesting observations and little-known facts.

These pictures have whetted my appetite. There are so many more wonderful creatures for Mr. Spinage to record for us. In the first place, I hope for a third African scene to put beside his Elephant in the Euphorbia savannah and his Topi on the grassy game-plains—Lochinvar Ranch with its Lechwe antelopes in moving friezes on the horizon, or in groups near the water's edge, surrounded by half the birds in creation—Cranes, Geese, Stilts, Terns, Herons, Duck, Egrets, Ibis and Plover. And perhaps

a fourth, if the technical difficulties can be overcome—Colobus Monkeys in high forest.

Then many wonderful and exciting animals are missing from his list. I would like to see White Rhino, Bongo, Chimpanzee, Giant Forest Hog, strange nocturnal creatures like the termite-eating Aardvark or the scaly Manis looking like an animated giant fir-cone, and that elusive small insect-eating hyaenoid, the Aardwolf, followed up by a series of beautiful antelopes like Kudu, Sable, Roan and Oryx, and lesser creatures like Civets, Monkeys, Honey Badgers, Mongooses and Bush-babies.

Lastly, I want many more of the big birds that are such a feature of East Africa—Bustards, Goliath Herons, Bateleur Eagles, Vulturine, Guinea fowl, Ground Hornbills, Secretary Birds, Giant Kingfishers, Lammergeiers, Sandgrouse: and surely there should be more reptiles—Monitor and other lizards, with some of Africa's beautiful snakes, and finally more representatives of insect life—termites, safari ants, locusts, spiders, moths and beautiful butterflies.

These, I hope, are pleasures to come. Meanwhile, I warmly commend this first harvest of Mr. Spinage's dedicated skill to all lovers of Africa and all devotees of Natural History.

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INTRODUCTION

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When I arrived in Kenya in 1953 to fulfil a two-year contract with the Kenya Police, I had little thought of studying wild animals. The country was in the throes of the Mau Mau emergency and I was soon engaged in anti-terrorist patrols in and around the Aberdare Mountains. Observing and identifying the various occupants of the forest became an absorbing diversion and I soon learnt what it was like to meet big game face to face. A knowledge of whether a Rhino's tracks were fresh or not often averted an unpleasant situation, to say the least of it. There was no time for photography under these circumstances. But as my enthusiasm grew so the emergency waned, and I was able to pay visits to the various national parks and reserves throughout Kenya, Uganda and Tanganyika. It is to the animals of these three countries that this book is limited.

Needless to say, I did not remain for only two years. When the active phase of the emergency ended I left the Police to take up other employment. This gave me greater leisure for an ardent study of wild life, and altogether I spent seven years in East Africa.

In England I had always been an "inquiring naturalist"—an expression which is meant to convey more than the fact that I always had my head stuck in the nearest pond. It is in this inquiring spirit that I offer this book as a natural history of some of the mammals of East Africa.

I have restricted it to the study of the more typical examples of the fauna, about some of which research has produced interesting facts in the last five years or so. Passing reference is made to many other animals, not only mammals, in order to show the diversity of life that exists in East Africa. But obviously a line must be drawn somewhere to prevent a book of this kind from becoming merely a long list. To quote only two examples, butterflies and snakes have been omitted, though both are typical inhabitants of the African countryside.

The reader will not find descriptions by which the animals may be identified. There are already a number of good books which provide these. Like most writers I have tended to dwell on the larger mammals, which are after all the most spectacular, the most familiar to us all. A well-known authority on African wild life, the late Stevenson-Hamilton, once said that we could afford to overlook the smaller animals for the time being because they would survive long after the large ones had been exterminated. I wonder. The numbers of the Bush Squirrel in Kenya have already been greatly reduced because of the destruction of its habitat; animals such as the Potto, the Brush-tailed Porcupine and the "Flying" Squirrel are amongst the rarest of our East African mammals. Civilisation is taking its toll so rapidly that we cannot afford to be complacent about the preservation of any animal whether big or small. Before people—and this applies especially to the Africans of the emergent Africa—are going to want to preserve animals they must be interested in them. It is not enough to appreciate the beauty of a graceful Impala cropping grass that could be equally well cropped by cattle.

The hunting of these animals, so far their chief attraction, is on the way out. Let us hope that it will be replaced by a desire to know more about their intimate lives and relationships

rather than their reactions to being hit by a .375 magnum bullet.

If I have been able to convey some of my enthusiasm for this subject through this book, then I shall feel my task to have been a pleasure well worth while.

Finally, I should like to thank all those friends and acquaintances who have contributed wittingly or unwittingly to the writing of the book and to those scientists whose research has provided many of the facts recorded in it.

CHAPTER ONE

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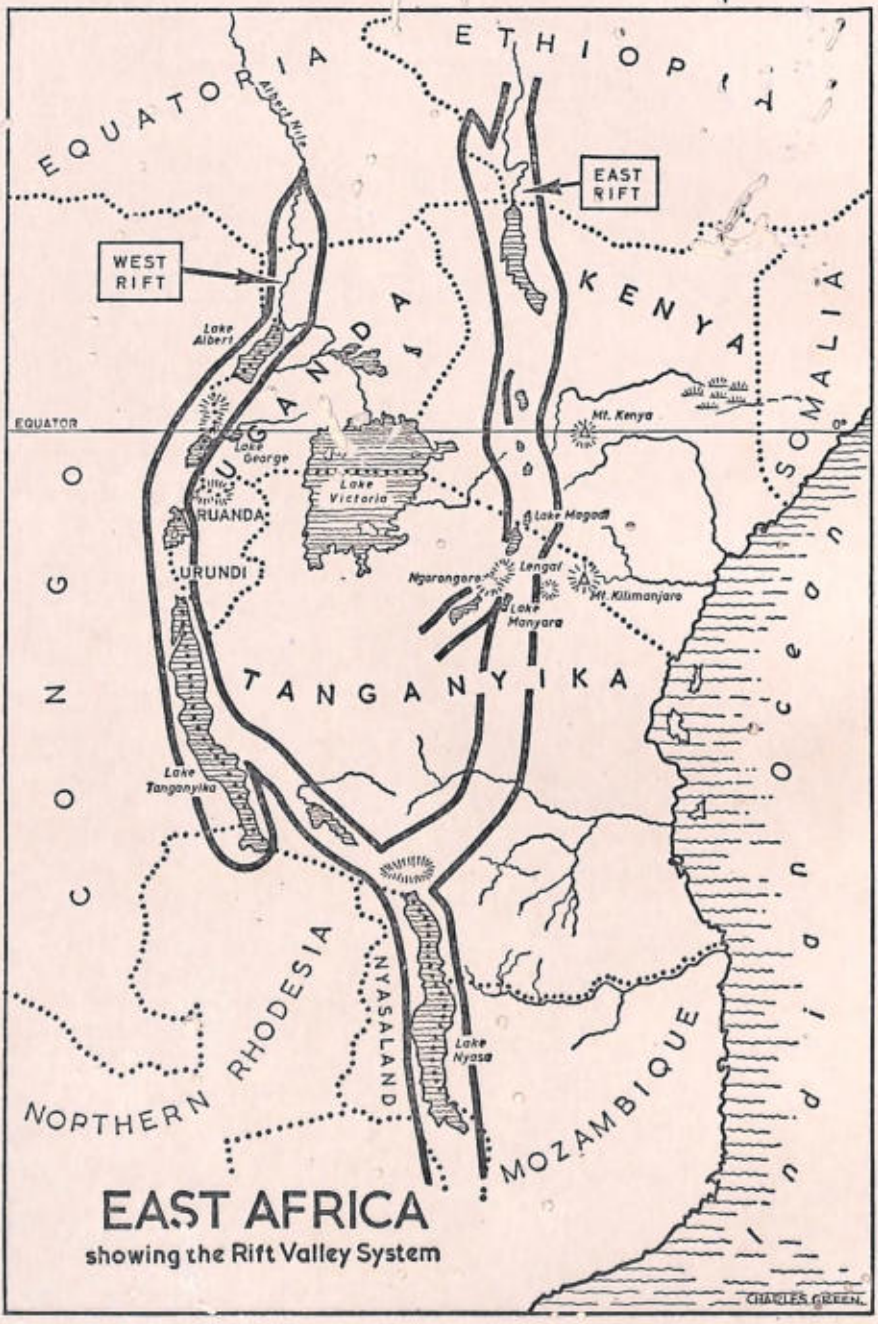
THE EAST AFRICAN SCENE



EAST AFRICA

showing the Rift Valley System

THE EAST AFRICAN SCENE

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The impressive and immensely varied fauna that inhabits East Africa to-day represents only a tiny remnant descended from the once great age of mammals. Less than a century ago it still dominated this part of the world. To-day even this remnant seems to be threatened with a drastic reduction that can only lead to the extermination of many familiar species.

An incomprehensibly long time ago, estimated at 225 million years, the first true mammals, known as Panthotheres, appear in the fossil record of both South and East Africa. They were no bigger than rats or mice, but from these early beginnings the mammals went from strength to strength and reached their peak of development in numbers and variety about 35 million years ago. This was in the Miocene period when, owing to increasing dryness, much of the denser vegetation is believed to have given way to a more open type of country.

This is the general aspect which persists, and looking at the animals of East Africa to-day is like taking a peep at living history: apart from the loss of many species and a great reduction in numbers, they show us what life was probably like over a great part of the earth's surface until almost a million years ago.

The East African landscape consists for the most part of a vast, almost featureless, plain. This plain is thrown into relief by the Rift Valley System and its volcanics, which are in turn part of a greater single system that extends from Syria in the north some

3,000 miles down the eastern coast of Africa, to just south of the Zambesi River.

The floor of this great valley varies from thirty to eighty miles in width and is characterised by a number of lakes. In East Africa the Western Rift stretches from Lake Tanganyika, the second deepest lake in the world, to Lake Albert; the Eastern Rift lies to the east of Lake Victoria and cuts Kenya in two. Apart from Lake Tanganyika most of the lakes are very shallow, many of them being soda lakes in areas of closed drainage. The most notable of these is Lake Magadi which is the best natural source of soda in the world—the soda is replaced faster than man can remove it.

The outstanding feature of the country is undoubtedly the volcanoes which rise sharply from the surrounding plains: high craggy mountains, many with snow and ice on their peaks and higher reaches. Mount Kilimanjaro, 19,340 feet high, is the highest single mountain in the world as it rises straight up from the plain and is not part of a mountain range. Although situated almost on the equator its nearly perfect volcanic cone is ice-clad throughout the year (Pl. 1). Most of these volcanoes, such as Mount Kenya, ceased activity countless ages ago, but others are more recent. Oldoinyo Lengai in Northern Tanganyika was last active in 1940 and the lava within its cone is still bubbling merrily away; steam vents and hot springs are a common feature of the Rift Valley. Another outstanding volcanic feature is the great caldera of Ngorongoro. It is not a typical volcanic crater but a huge volcano that has fallen in on itself, producing a vast bowl 2,000 feet deep and some hundred square miles in extent. It provides a unique home for large numbers of wild animals.

Another striking feature is the comparatively recent lava flows which came to rest abruptly out on the open plains, where the hot treacly lava eventually solidified. In the dry areas the land-

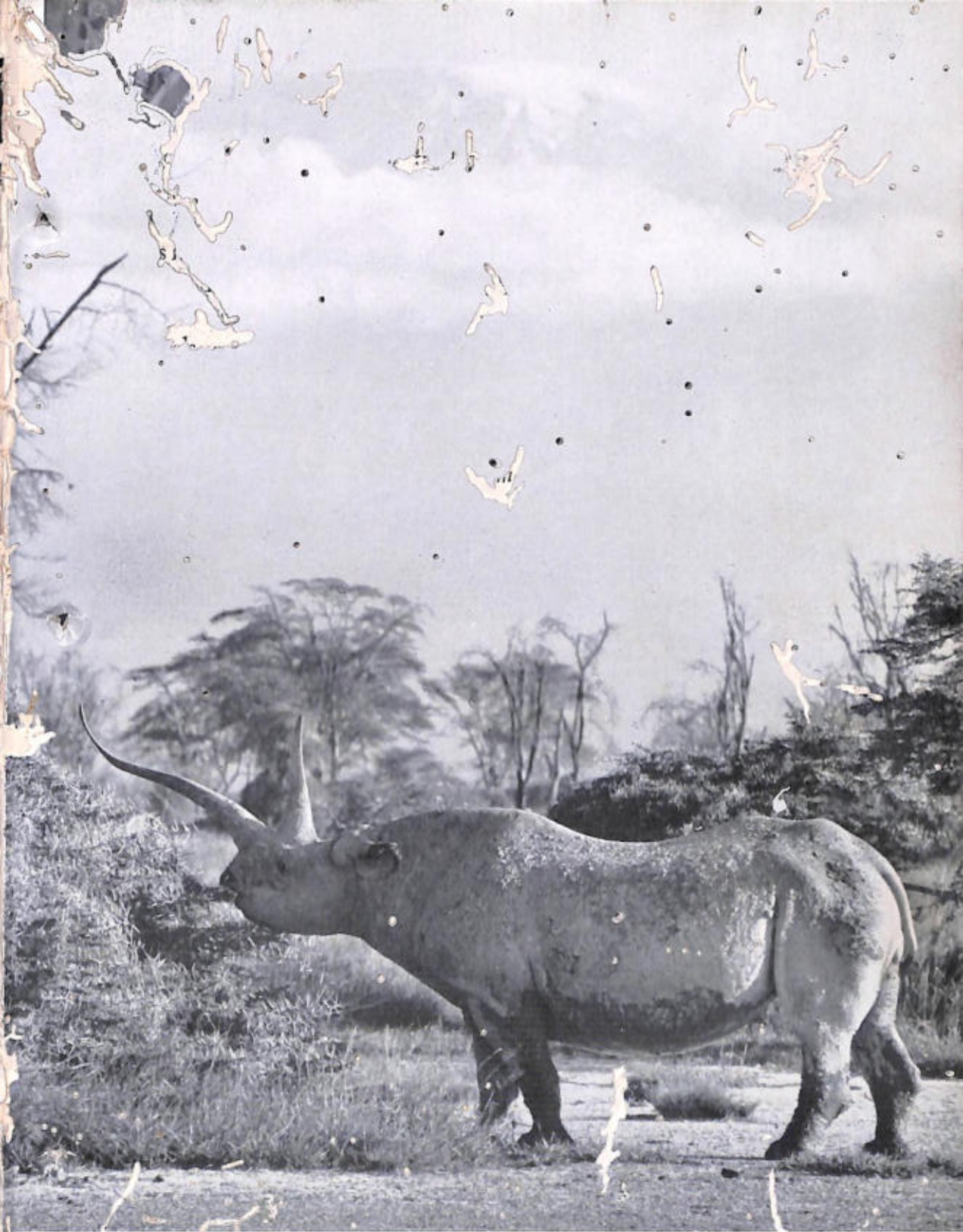

PLATE I: *The ice-clad summit of Mount Kilimanjaro with Gertie, a Black Rhinoceros, feeding in the foreground*

PLATE 2: *The semi-desert country of Kenya's Northern Province. The skeleton of a tree is evidence of better conditions in the past*

BELOW: *Typical grassland plains in western Uganda with Topi in the foreground and Uganda Kob behind*

PLATE 3: *An animal trail through the Bamboo forest*

scape is one of gentle undulations, the hills smooth and curving in notable contrast to those where rain is plentiful. The latter are slashed and scoured where swift-flowing streams have cut their way vigorously through the recent deposits, forming deep chasms and gullies whose steep-sided banks time has not yet worn into gentler shapes (fig. 47).

The climate of East Africa is complicated. It is influenced partly by the trough of the Rift Valley and partly by that vast inland sheet of water, Lake Victoria. This lake, which has a surface area of 26,828 square miles, is not in fact part of the Rift Valley System but occupies a huge scoop in the earth's crust and has been rightly described as a gigantic puddle. Nowhere does it exceed 270 feet in depth.

The rains in this part of Africa tend to be seasonal but there are no well-marked seasons such as occur in temperate latitudes. There is generally said to be a short rainy season and a long rainy season, the times of which vary in different areas. Not infrequently the rains fail to appear at all, as happened in many parts of Kenya in 1961, causing a disastrous loss of animal life, this was followed by just as disastrous floods. Some areas, as in Northern Kenya, hardly ever get any rain anyway and one part is a true desert. On the other hand, the coastal and the mountainous areas always receive plenty.

While it is hot in the low country all the year round, in the more mountainous areas the temperature is cool and becomes colder as the height increases: in the Aberdare Mountains hoar frosts are common at eleven thousand feet. The temperatures and the rain together control the vegetation and this in turn controls the animal life. The areas above thirteen thousand feet are pretty well devoid of animals. Some Rock Hyraxes may live above this line and a frozen Leopard has been found near the summit of

PLATE 4: *The Murchison Falls on the Victoria Nile in northern Uganda*

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Mount Kilimanjaro; but on the whole it is too cold and bare for animal comfort.

In a study of the animals living below thirteen thousand feet we can divide the habitat roughly into forest, bush and plain—river and lake life form separate but interrelated communities. The matted, steaming jungle of popular fiction does not exist in East Africa; and matted though some of the forest may be, it usually consists of giant stinging nettles and unromantic prickly shrubs. Apart from the vast tropical rain forest of the Congo and West Africa, the forests are restricted mainly to the high ground. In places they are thick with a dense undergrowth but they are seldom impenetrable. Perhaps they are thickest in the bamboo zone which would be difficult to penetrate were it not for the Elephant, Rhino and Buffalo which beat out convenient paths (Pl. 3); in fact, Elephants sometimes make complete roundabouts with paths converging on them from several directions. But except for these large animals, and perhaps the beautiful black-and-white Colobus Monkeys swinging in the tree-tops or a Bush-buck slinking through the undergrowth, the animals of the forest zone are seldom seen.

The term "bush" covers just about any type of country between forest and open grassland. It ranges from dense bush, as distinct from forest, through grass land with scattered thorn trees, to semi-desert conditions, which in the dry season consist of bare earth with scattered, almost leafless, thorn bushes interspersed with cactus-like succulents (Pl. 2). Bush country grades indefinably into plains, the latter indicating a more open type of country in which grassland predominates, like the savannah of America.

Here on the plains (Pl. 2) is the home of the majority of the large plant-eating or herbivorous animals and the attendant carnivores which prey upon them—and these are the creatures with

which one usually makes first acquaintance in East Africa. Perhaps the most striking and numerous among them, the inevitable "Z" of the children's alphabet, is the Zebra. Here it lives not as a strangely striped black and white horse, something to be stared at on a Sunday in the Zoo, but as a dynamic part of an intricate and exciting environment. So, indeed, live all these animals, revealing their strange habits and interrelationships only to those who take the trouble to look, to listen and to think.

CHAPTER TWO

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ANIMALS OF BUSH AND PLAIN

Zebra—Giraffe—Wildebeest—Hartebeest—Topi—
Waterbuck—Kudu—Eland—Thomson's Gazelle—
Grant's Gazelle—Gerenuk—Impala—
Uganda Kob—Wart Hog—
Baboon—Ostrich

*

A number of different varieties of ZEBRA have been described in Africa, but there are two predominant species. These are the Grevy's Zebra, *Equus grevyi* (Pl. 6), which is restricted to the more arid areas of northern Kenya and beyond, and the Burchell's Zebra, *Equus burchelli* (Pl. 5), ubiquitous mostly outside of the range of the other. The former is the larger of the two, with much narrower stripes running vertically down its flanks, and with much bigger ears. If you look at the photographs of a Burchell's Zebra you will see that its broader stripes are vertical only on the neck and forequarters, most of the others tending towards the horizontal; but more about these Zebra stripes later.

The Zebra is of course a type of wild horse and most people know the story of the horse's evolution from a small animal, about the size of a Fox-terrier, with four toes on the fore and three on the hind feet, to its present form with a single functional toe and long, stilt-like running legs. However, one form did not just replace the other; many of the forms existed side by side over long periods, and a pony-sized three-toed horse, known as Hipparion, was living side by side with the Zebra in East Africa right into the middle of the Pleistocene era, about 500,000 years ago.

I use the term "side by side" in the sense of time only, for Hipparion was probably an inhabitant of the forest or river fringes, whereas the Zebra, with its long legs, was more suited to

the open country where it could move about swiftly and escape its enemies. It may not possess the stamina of a domestic horse—one reason why it has failed to be successfully domesticated. But the horse only acquired its constitution by goodness knows how many years of selective breeding. All the same, the Zebra's turn of speed enables it to hold its own against the carnivores which prey upon it. Its legs are restricted to a fore and aft movement, with much fusion and interlocking of bones—we shall see later how an entirely different animal, the Cheetah, also attains high speed through the rigidity of its limbs.

It is not solely speed on the flat, however, which has accounted for the Zebra's success in life. It also possesses an acute sense of sight, hearing and smell, and the capacity to learn and to modify its behaviour by experience. When danger appears on the scene the Zebra, like many other animals of the plain, reacts instantaneously; this reaction is far more important to its survival than the maintainance of speed.

Zebras are gregarious animals and, in places like the vast Serengeti Plain of northern Tanganyika, where conditions have changed least in East Africa, the herds number many hundreds of individuals. In Kenya anything from five to fifty would be more common; but we know from the writings of Blayney Percival, who was Game Warden of Kenya at the turn of the century, that this was not always the case. He reports Zebra as moving in their thousands from the Baringo area to Lakes Nakuru and Elmenteita. Already in 1924 he had noticed that the movement of Zebra had been considerably reduced by the wire fences that had been placed on farms along the trek routes. To-day we are left only with these isolated groups.

The Grevy's Zebra of northern Kenya move in small herds. Competition for food in this arid area probably accounts for

PLATE 5: *Burchell's Zebra with foal; note the latter's long legs*

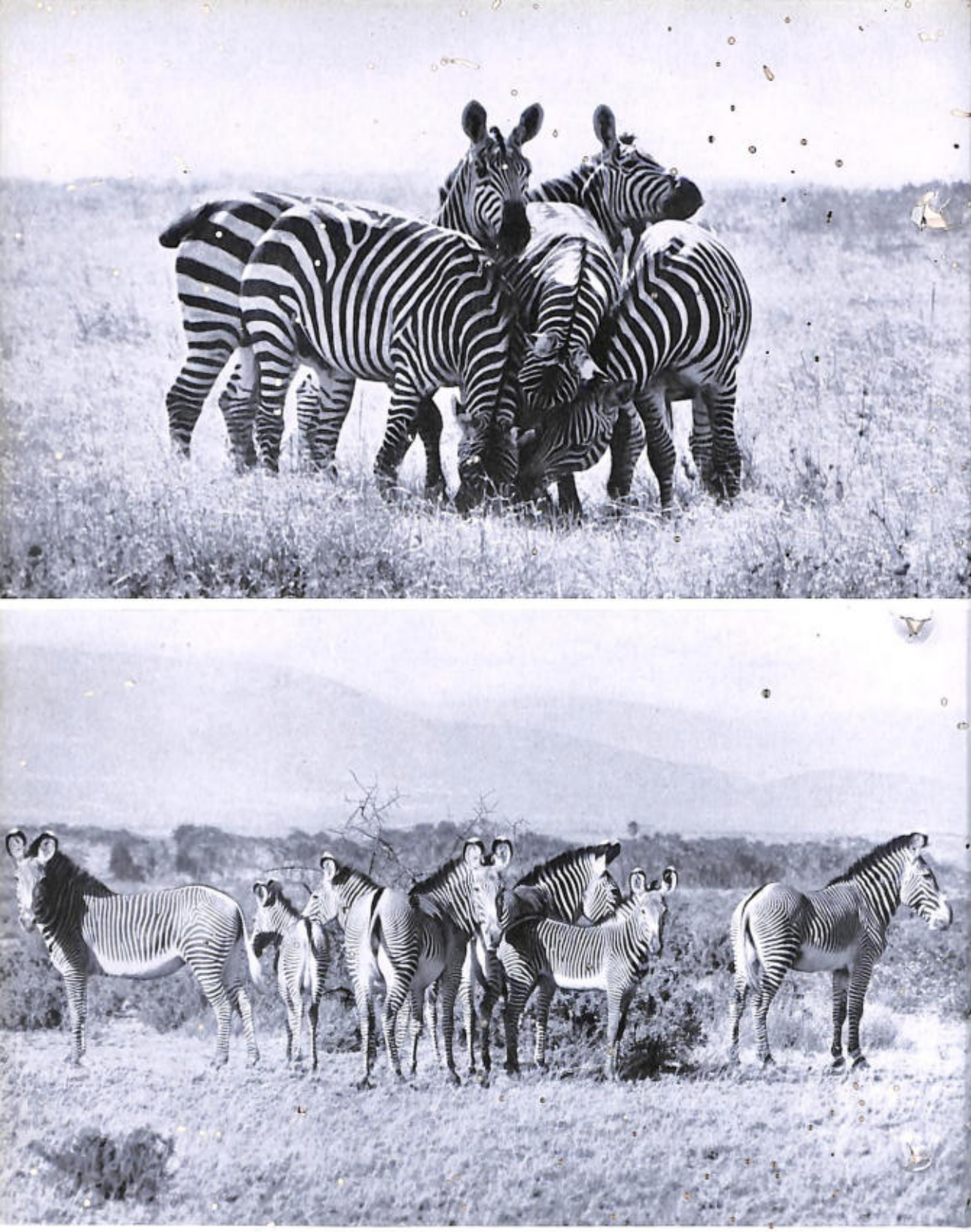

PLATE 6: *"Pushing and shoving against one another, all trying to get their noses on the same spot"*
BELOW: *A herd of the narrower-striped Grevy's Zebra*

PLATE 7: *Bot fly larvae,* Gastrophilus, *in the stomach of a Zebra. The largest are about half an inch in length*

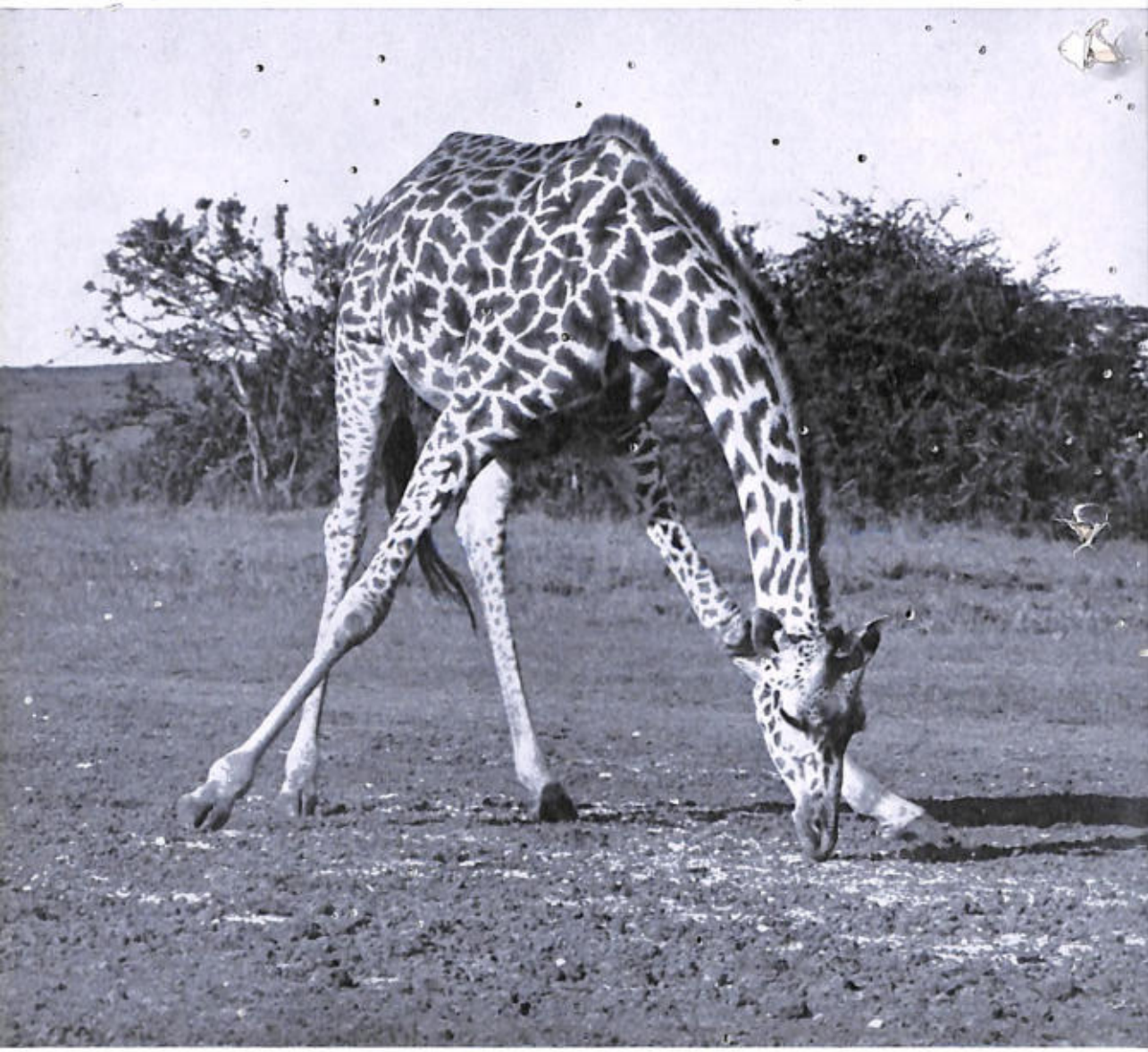

PLATE 8: *Common Giraffe licking salt*

PLATE 9: *The Reticulated Giraffe*

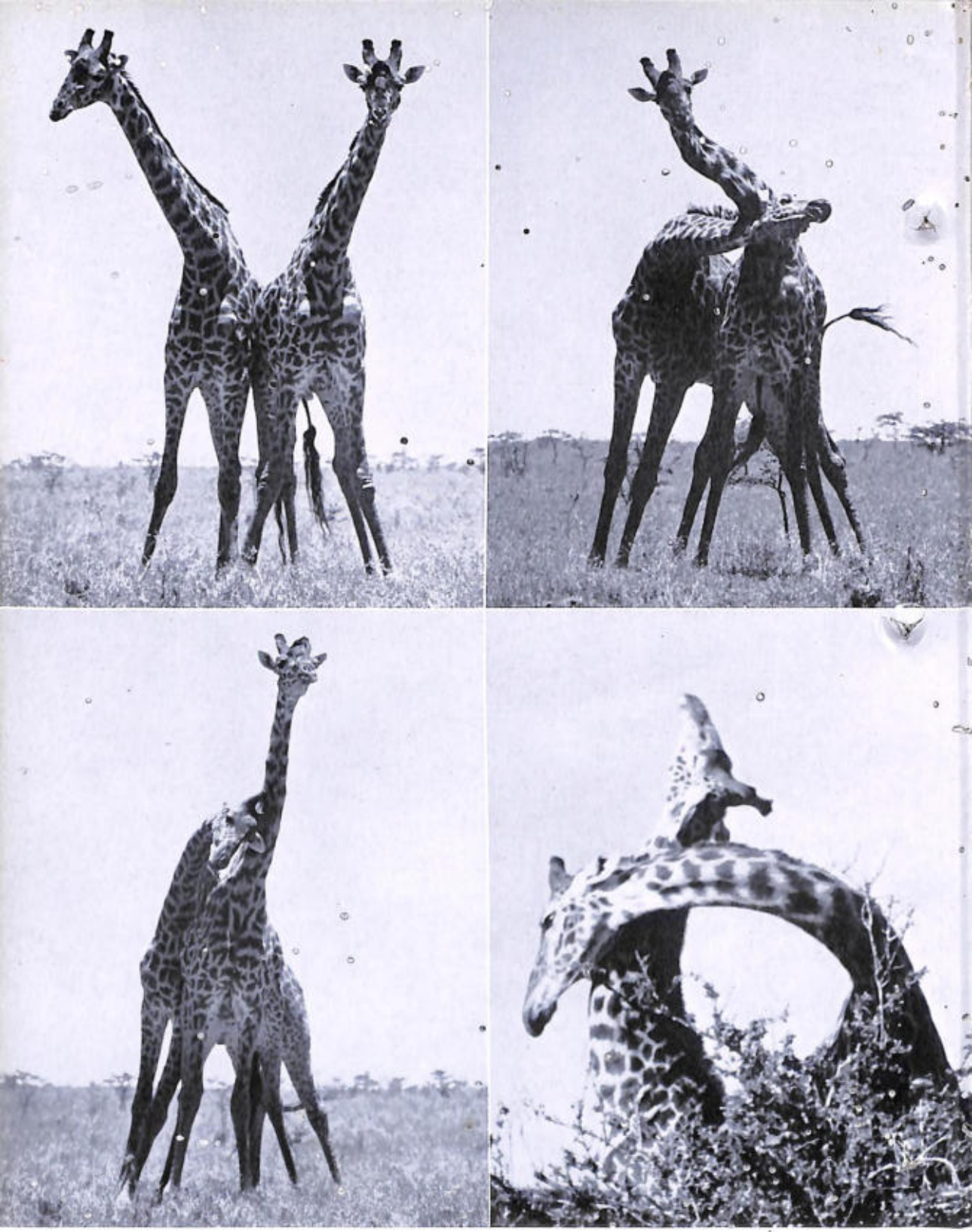

PLATE 10: *Giraffe "necking"*

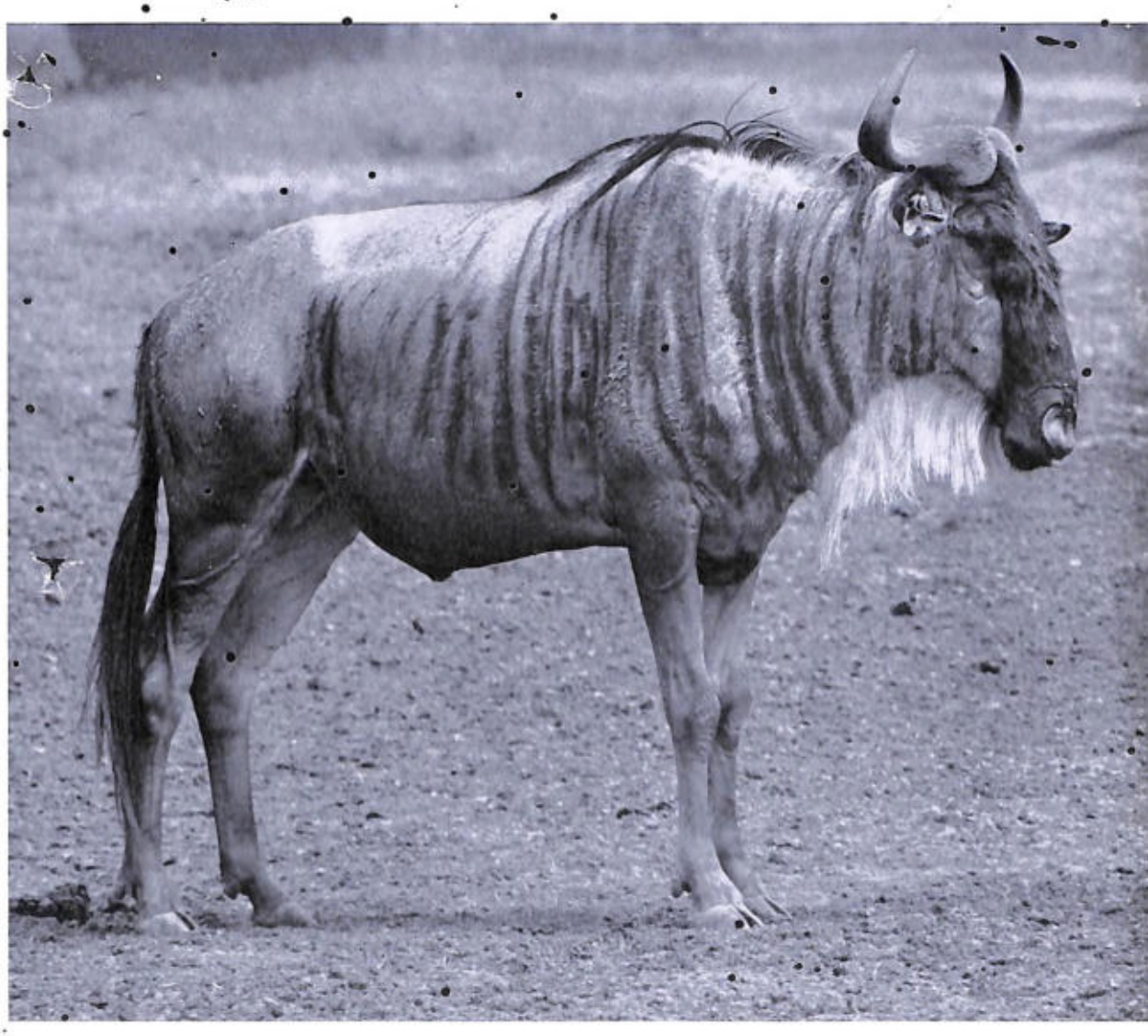

PLATE II: *White-bearded Wildebeest*

PLATE 12: *Wildebeest with calves in the Ngorongoro Crater*

this. But where there is little or no struggle for food, safety in numbers probably binds the Zebra herds rather than mutual affection.

We know nothing about the composition of Zebra herds throughout the year. During the breeding season successful stallions gather a group of mares together. But whether the young stallions are driven out or tolerated within the herd, or whether any lasting relationships are built up between mature animals, seems to be unknown.

During the month of March in Kenya I have seen Zebra indulging in all sorts of antics, the favourite being mock fights between groups of males. Rearing up at one another violently, hoofs flailing and mouths agape, they vigorously strive to bite one another's necks; yet no harm seems to come from these mock encounters. An even stranger sight is when a Zebra suddenly muzzles the ground and the others follow suit, pushing and shoving against one another, all trying to get their nose on the same spot (Pl. 6).

The Zebra has always been suspected by farmers and others of being the most heavily parasitised of the larger African animals and thus a potential threat to farm livestock. Such accusations are entirely unfounded, and it has yet to be shown statistically that it carries more ticks than any other animal, as is so often asserted. One of the reasons why it has been black-listed in this manner is probably because the large intestine, when opened up, is found to contain a seething mass of small white worms, ranging from one to five millimetres in length. As many as four million of these worms, known as *Crossocephalus*, have been estimated to inhabit a single Zebra. But in spite of this frightening number the worms probably do the animal more good than harm. As they lie freely in the intestine they cause no injury to the lining and can only

live upon food that has been ingested by the Zebra. Both adult and immature stages can be found together and it seems probable that they pass the whole of their lives in this situation. The dead adults may well form a source of easily digested protein which the Zebra could not obtain directly from its normal diet.

To my mind, the most interesting feature of the Zebra lies in its colouring, and this has excited the interest of naturalists for many years. The variety of the colour schemes of mammals, nowhere exhibited so strikingly as amongst the African fauna, has produced a confusion of ideas regarding their value to their possessors. Much of this confusion has arisen from the old idea that all animals bear a protective coloration evolved through a process of natural selection, and admittedly most of the surviving mammals are of sombre hue. But this may be merely because colour does not play a significant part in their lives, such as it does for example in birds.

The Zebra with its bold black and white stripes has of course always been at the centre of colour controversies. The Burchell's is extremely conspicuous at close quarters; but as it moves away there comes a point where the bold stripes merge together into an indistinct grey. The human eye is unable to define them separately at this distance. A person suffering from a mild degree of astigmatism finds it uncomfortable to look at a number of moving Zebras even at fairly close quarters owing to the glare. When there is a heat haze the merging effect is very marked, and in aerial censuses it has been found easier to count such animals as Wildebeest than Zebra. But whether this effect is of any advantage to the latter is of course a matter of some doubt, for we cannot assume that animals see things in the same way as we do.

At close quarters the Zebra knows that it is visible and there-

fore always runs from danger; it never attempts to escape observation by immobility, the usual behaviour of an animal depending upon its colour for concealment. It is true that in shadowy forest areas the Zebra is not easily seen. But it is rarely found in such places, preferring the open plains where it can see or scent the approach of an enemy. I once came across Grevy's Zebra trekking to water in thick forest, on Marsabit Mountain in northern Kenya; but such instances are exceptional.

A theory has been advanced that black and white stripes on an object create the optical illusion that the object is nearer than it really is; thus the Lion might be deceived and misjudge its leap. In my opinion this is carrying theory a bit too far; for I very much doubt whether the Lion's leap is as finely calculated as all that.

When it occurs in other mammals, colouring like that of the Zebra is almost invariably aposematic or warning. But certainly no predator seems to be put off by the Zebra's appearance. It is therefore almost impossible, without a series of planned field experiments, to arrive at any conclusions about the enigmatical colouring of the Zebra. The real answer may not lie in any of these external considerations but in the physiological requirements of the animal. The alternating bands may act as a sort of venetian blind, ensuring a moderation of the sun's rays over its body. If it were all black it might absorb excessive heat, whereas if it were all white it might reflect excessively. A pattern of alternating stripes avoids these two extremes and may be more effective than a light-brown coat. I might add that melanism, or overall black coloration, a not infrequent mutation or freak amongst carnivores, seems to be more frequent at higher and thus colder altitudes.

The Grevy's Zebra of the north lives under much hotter conditions and its narrower stripes produce an even more dazzling

effect than the Burchell's; at the same time they may produce an even better regulation of the effects of the sun's rays.

People often remark upon how fat and healthy the Zebra always look, even when the grazing is at its poorest in the height of the dry season. As often as not this is an illusion caused by the glaring effect of the black and white stripes, which tend to disguise the animal's outline. When one gets close, within five feet or so, they may look quite different. Yet Zebra are fat compared with most other hoofed mammals or ungulates, and this is because they deposit their fat under the skin, a method common amongst animals in colder climates, but unusual in the tropics as it prevents the efficient dissipation of heat. How the Zebra overcomes this handicap we do not know, for it almost never seeks shade even in the hottest part of the day. Most other animals deposit their fat in great white masses around the heart and not intermuscularly like domestic cattle and sheep. This is why the meat of these wild animals is generally considered to be "dry" and poor eating. The fat of course serves as a food and water reserve in the dry season, when it is chemically converted by the animal.

From time to time a letter appears in a newspaper or nature magazine from someone who has seen a mane-less Zebra. This is an abnormal hereditary feature that often crops up. There used to be many such Zebra in the coastal area of Kenya and there are plenty in Uganda and the southern Sudan; in Italian Somaliland there is a whole herd which is maneless.

Striking as the Zebra is the pride of place for the most remarkable-looking animal of the plains undoubtedly goes to the GIRAFFE (Pl. 8-10), a ruminant herbivore but a very strange one. It is more closely allied to the Deer than to any other animal.

Ever since Charles Darwin used the Giraffe's neck as an example of his theory of evolution by natural selection (*Origin of*

Species, 1859), there has been considerable speculation about how it got its long neck. Strangely enough it contains only seven neck vertebrae, like our own necks; this primitive number has been retained in almost all mammals.

In order to supply blood to its lofty brain the heart of the Giraffe is not noticeably more muscular than that of other mammals, but the neck arteries incorporate a shunt mechanism which prevents congestion when it suddenly raises or lowers its head—a very necessary mechanism as it always does this with a jerk when drinking water or licking salt. It hates to lower its head because it knows that it is then more vulnerable to attack (Pl. 9). Giraffes never lie down unless there is one standing on guard. When it is going to drink, which it does quite often, it first either splays its forelegs out stiffly to either side, or else bends them at the knee; then, after a little preliminary bobbing up and down of its head, it lowers it quickly and drinks. All of a sudden it raises it with a jerk to see if it can spot any predators creeping up on it, and after having repeated this procedure several times it brings its legs together with another little jerk. As the head of a Giraffe may be from sixteen to eighteen feet from the ground it can be seen that some mechanism to ensure that the flow of blood to the brain is not checked is highly necessary.

What are the advantages to the Giraffe of such a long neck? Well, in the first place it can browse upon shoots which no other animals, excepting perhaps the Elephant, can reach. However it is not restricted to the tops of trees and feeds just as frequently upon bushes no more than three or four feet high. Also important is the periscope-like effect which enables it easily to spot lurking enemies in the grass (Pl. 30). For this reason the Lion is seldom able to attack the Giraffe, usually only killing it when it is feeding in bush where its vision is obscured.

It is an extremely obvious animal out in the open but in bush or light forest it is not so easily detected. The commonest is the Masai or Common Giraffe, *Giraffa camelopardalis* (Pl. 9), whose colour consists of irregular star-shaped brown splotches on a light background. In the north of Kenya there is another species known as the Reticulated Giraffe, *Giraffa reticulata* (Pl. 8), which, as its name implies, has a reticulate pattern of darker colour. In this respect it does not fit in with the general principle that mammals in arid areas exhibit a lighter coloration.

The long neck is much more flexible than many people think, as is easily seen when Giraffe are "necking." This practice is only indulged in by the males and, although the procedure varies, it begins by two animals pushing against one another's fore-quarters. Then one suddenly swings its head and neck over backwards or sideways, attempting to strike the other on the neck with its horns. Sometimes there is an impact which is audible for quite a distance; but more often the other Giraffe avoids the blow or retaliates simultaneously (Pl. 10). On occasions this "necking" is quite violent; there is even a report of one animal having been knocked out; yet often it consists of mere neck-rubbing. Sometimes three or four will join in together, and I have even seen quite small Giraffes trying to imitate their elders, pushing in and having a swing at them.

Such displays are often followed by aberrant sexual behaviour on the part of the males, which will try and mate with one another. These are probably practice bouts for the serious fighting that may take place during breeding, when they are fighting for the dominance of groups of females. Perhaps the males become erotically stimulated by the thought of what such bouts stand for. It seems that the males can only tell when a female is ready for mating by sampling the hormone content of her urine, a

practice that is carried out by a number of other animals. The males do not swallow it but, after tasting, curl back their lips in a characteristic manner and eject it in a thin stream.

Giraffe are recorded as occasionally giving birth to twins. But as the care of youngsters after a certain age seems to be a communal affair, it is only possible to state this with certainty by actually observing parturition, and not by the number of young following a female around. They tend to be gregarious although solitary individuals are common, perhaps a seasonal occurrence motivated by sexual instincts. It should also be remembered that, because of their ability to see far, a group can browse much more widely scattered than, say, a herd of Wildebeest, and still remain in view of one another.

The horns of the Giraffe consist of small bony protuberances which vary considerably in number, ranging from two to six or more. They are skin-covered in early life, but the top usually becomes exposed at maturity. Apart from the well-developed pair over the ears, there may be a further pair behind these and anything from one to three prominent knobs in the median line between the nose and the eyes. In addition to this there is sometimes a small outgrowth just above each eye socket, usually bigger on one side than on the other. The skull of an adult bull shows all manner of other small bony knobs and protuberances.

It has been suggested that the Giraffe changed from a two-horned animal in the south of Africa to a three-horned animal in the north, with the central region producing four to six-horned ones; but owing to the great variability shown by the horns this classification is now generally rejected.

The Giraffe did not in some distant era, as has been often suggested, "lose" its horns to be left with mere bony stumps. It

never possessed more than it has now, and a study of their development compared with that of other horns shows that they represent a primitive condition. This is possibly because of the animal's long neck, for any additional weight balanced on top of the skull would require a vastly more muscular structure to hold its head up—the neck would have to be of a much thicker construction which in turn would result in the body and legs becoming stouter, until the whole animal would be too slow and heavy to survive. In fact, what we now have reached is a picture of the Sivathere, a primitive Giraffid that survived side by side with the modern form into the Middle Pleistocene period. This was a stocky animal rather like the Okapi of the Congo forests, but much more heavily built and bearing quite large, rather ornamate, horns. The discovery of the Okapi in 1900 was all the more exciting because of its similarity to these fossil forms, although it also was living with them in the Pleistocene.

An examination of the modern Giraffe's skull shows that its whole structure is designed for lightness, the thick bone areas being like a sponge inside with large pores; and it is probably this reduction in weight, which may have had a direct relationship to the lack of horns, that has enabled it to survive as it is.

At first sight an ungainly animal, the beautiful balance which the Giraffe exhibits has often been praised. It can gallop with ease and rapidity over the roughest of country, ducking its head in a sinuous graceful movement to avoid low branches and other obstacles, the long forelegs balancing the neck.

I might add a note about the nerves of these animals. In the Second World War a young Giraffe in the Whipsnade Zoo was so terrified by a bomb that landed near, that it ran round

PLATE 13: *The Eland, a great cow-like and docile beast*

BELOW: *Coke's Hartebeest*

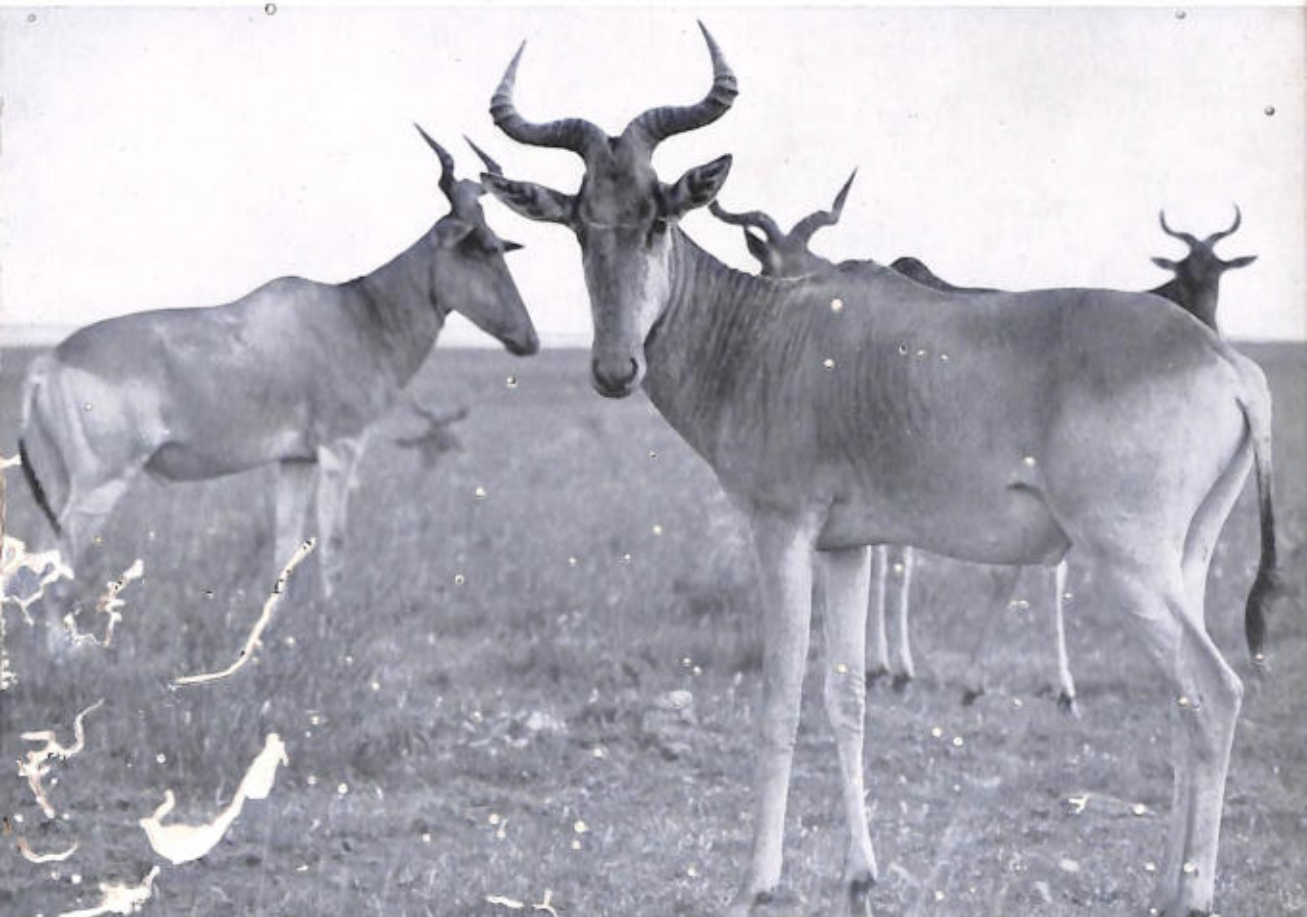

PLATE [illegible]–15: *Uganda Kob*

ne plains of north n Uganda

PLATE 16:
"Its back was completely healed, although deformed." A Defassa Waterbuck attacked by a Lion in Uganda

Reedbuck

and round in its enclosure for several hours until it collapsed and died of exhaustion.

We now come to that great group of ruminant plains animals which like the Zebra and Giraffe are herbivores, but which possess keratin covered horns—and this distinguishes them as members of the family *Bovidae*, or "ox-like" animals. They vary enormously in appearance from the large Eland and Buffalo down to the tiny Dikdiks and Suni, and indeed many of them do not look at all "ox-like," so the family has been divided into a number of sub-families, namely, the "ox-like ox-like animals," the "animals with heads," the "horse-eared animals," the "bright-eyed animals" and the "goat-like animals": silly sounding names when translated literally but impressive enough in their Greek and Latin forms—respectively the *Bovinae, Cephalophinae, Hippotraginae, Antilopinae* and *Caprinae*. The larger ones are often referred to collectively as ungulates, but this is a very unspecific term merely meaning "hoofed mammal."

Ruminant animals, ruminant meaning that they chew the cud just like a cow, have the stomach divided into a series of complex folds. Into the first of these, food, which can be rapidly snatched up and lightly chewed, is stored until it can be regurgitated and re-chewed when the animal is resting. This is possibly related to the fact that many ruminants are not really built for speed like the Zebra, which can move away rapidly from an unfavourable area or circumstance.

The commonest of these animals is the strange-looking WILDEBEEST or gnu, *Gorgon taurinus*, which is often found grazing mixed with herds of the Burchell's Zebra. Although the Wildebeest (Pl. 11), the "clown of the plains," can present both a comical and a frightening mien, it is, like the Zebra, a quite

harmless and inoffensive animal, seeking safety from its enemies in flight.

It is by far the most numerous of the larger animals of East Africa, and wherever possible it lives in large herds. The migrations of these vast herds are perhaps the most interesting thing about these animals.

The pattern of animal life in East Africa has been so broken up that, apart from the information in Blayney Percival's two books (*A Game Ranger's Note Book* and *A Game Ranger on Safari*), we know almost nothing of what migrations may have occurred amongst the various species of mammals that we see inhabiting a particular area to-day. But even in a small area like the Nairobi National Park, which is only 44 square miles in extent, one can notice that a certain animal is here to-day and gone to-morrow. One usually assumes that it has just moved off to somewhere else nearby, when in fact it has probably migrated in the true sense of the word. Yet owing to the limitations imposed by man it may have moved only a fraction of the distance that it could have travelled perhaps fifty years ago.

Recent censuses of Wildebeest in and near the Nairobi Park have shown the reality of this migratory urge which on a small scale is termed "seasonal distribution." Aerial counts of these animals have shown a definite annual migration within a small triangular area of about 400 square miles. The triangle is bounded on the left side by high ground, on the right side by farmland and a steep gorge in the north; and at the base the country merges into relatively unattractive rough thorn scrub and native habitation, as opposed to the rich grass of the triangle proper.

When the plains are well watered the animals are scattered near the base of the triangle, concentrating in the shorter grass which has usually been burnt off. Gradually they work their way north-

wards towards the apex until they come to the edge of the steep gorge. Being reluctant to try and pass this natural barrier the population gradually builds up against it in the dry season. With the coming of rain they return southwards until they reach the basal boundary and the cycle is completed.

To see Wildebeest migrations on the grand scale as they occurred before the civilisation of East Africa, one must go to the Serengeti Plains, where some hundred thousand Wildebeest make an annual trek of about two hundred miles, calving in the process. Such a trek can provide quite a spectacle: during the early part of 1960 in one area there was a build-up for three days until the animals covered an area some four by eight miles! It is stated by an onlooker that grass which was three feet high was eaten down to four inches in two days. On one occasion an estimated herd of 5,000 visited a river to drink; pushing and shoving there were sometimes as many as three animals on top of one another; and as a result nineteen animals were later found crushed to death in the water.

The question often asked is "Why do they migrate?" The answer is fairly straightforward: animals that exist in dense numbers must move about to find enough food and avoid fouling the ground. But the system of migration is a much more difficult problem. It was probably laid down long ago when even greater concentrations of animals moved in unison, so that now the path of migrations is one of long habit which will only change very slowly. Wildebeest when migrating have been observed to leave areas of good grass and enter poorer areas for no apparent reason —it may be due to a habitual urge to keep moving.

The spectacle of the trekking animals was well captured in Walt Disney's famous film *The African Lion*. One can almost smell the acrid lava dust stirred up by the myriads of hooves as the

animals move slowly along, lowing incessantly, so many voices together that they produce a mighty discordant roar across the plains. Heads bent against the Serengeti winds which are hot like the blast from a suddenly-opened oven door, at the side of the parents stagger the new-born calves on long, spindly but capable legs. At this early age they are not grey like the adults but are a pretty rufous colour with black snouts (Pl. 12). Around the fringes of the moving mass lurk the Lions, Hyaenas and Jackals, always on the alert to seize a straying calf or to attack a mother in labour, whilst high above wheel great numbers of ever-watchful Vultures, eager also for a mishap or ready just to feed on the afterbirth.

Again we have to admit ignorance of the social structure of these herds, but at certain seasons a number of males adopt a solitary existence, taking over a patch of bare earth, the site of an ants' nest, which they enlarge and live upon.

Early hunters always expressed great incredulity at the numbers of maggots that they found in the nasal passages, particularly of the Wildebeest, although they occur in many other animals. These are the larvae of a fly similar to the Bot fly described later. The adult female lays her eggs near the animal's nostrils and when they hatch the larvae enter the nasal sinuses, seemingly travelling first to the brain, where they can be found on the surface in most Wildebeest. They then go back to the sinuses where they grow to half an inch or more in length and are sneezed on to the ground when ready. There they pupate, finally emerging as the adult fly.

Side by side with the Wildebeest in many areas can be seen the rather odd-looking HARTEBEEST, or Kongoni, *Alcelaphus buselaphus*. Reddish brown in colour, its odd look is caused by its sloping withers and the very long face. The horns, unlike those

of any other animal, are situated on a bony pedicel, a backward extension of the skull forming an elongated base. They inhabit much the same areas as the Wildebeest but, although gregarious, are not nearly so numerous.

There are several species which are easily recognised by the difference in their horns. They never seem to attract any attention from writer-naturalists in spite of the interest of these different forms. One authority believes the animals inhabiting the Rift Valley to be crosses between the pure-bred varieties on either side. Near the town of Nakuru in Kenya, for example, there is a small herd, probably less than fifty strong now, which is believed to be a cross between a subspecies known as the Lelwel's Hartebeest of the north and Coke's Hartebeest (Pl. 13) from the south of the area. The interesting point about all this is that the Rift Valley seems to have played some part in separating these varieties in the past, and that in comparatively recent times they have been able to meet again and interbreed.

A fairly close but easily distinguishable relative of the Hartebeest is the TOPI, *Damaliscus corrigum* (Pl. 2). This is another animal with markedly sloping withers but differing from the Hartebeest in its sleek russet-coloured coat, which looks as if it is regularly brushed with brilliantine, and in its blue-black haunches. The latter are not readily discernible when there is a strong sun overhead as this tends to make the whole of the flank look dark.

Although in most parts of East Africa the herds number only some fifty or so animals, in the extreme west of Uganda they occur in much larger communities, their large herds making them the most numerous of the larger Bovids in the area. But in these herds numbering some two hundred or more Topi one can detect a difference in behaviour from the large Wildebeest herds. The

latter tend to graze in a much more scattered formation, whereas the Topi crowd together and, especially if alarmed, charge back and forth in a dense mass that makes the place resound with the thudding of their hooves. They are thus extremely difficult to approach because, as with all large herds of animals, one more nervous than the rest can set the whole herd off in headlong flight.

Not far from water a common animal is the WATERBUCK, a rather shaggy-coated beast that reminds me of childhood impressions of Santa Claus's Reindeer, except for the horns which do not branch. There are two species, both easily identified from their buttocks; the commoner of the two has an elliptical white ring around them, *Kobus ellipsiprymnus*, whilst the other, the Defassa Waterbuck, *Kobus defassa* (Colour Pl. 4), is white all over. Solitary males are often found, although this may be a seasonal occurrence as they tend to associate in small herds, one male with several females, the latter being hornless.

When wild animals fight the one that feels itself to be the weaker will often flee before serious injury is done. But this is not always the case and fights to the death may ensue, although probably they occur only when both animals are fairly mature and well matched, neither wishing to give in. An example of this was provided by two Waterbuck that fought to the death at the famous Treetops Hotel in Kenya, one actually pursuing the other into the waterhole there and killing it. The whole tragic event was witnessed by the Queen, then Princess Elizabeth.

There are many more of the larger ungulates that the observer may come across, such as the Greater and Lesser KUDUS, *Strepsiceros strepsiceros* and *Strepsiceros imberbis*, with their magnificent spiral horns. These animals are unfortunately rare in this part of

East Africa to-day, although this was not always the case; they were plentiful enough up until the great Rinderpest epidemic of 1889 to 1903, but never seem to have recovered. In 1918 their recovery was reported as being extremely slow in Kenya, although in Northern Rhodesia they were stated to be amongst the commonest of animals in 1925.

Other animals that are not very often seen are the Sable and Roan Antelopes, *Hippotragus niger* and *Hippotragus equinus*, the Reedbuck, *Redunca redunca*, and Oryx, *Oryx beisa*. Reedbuck (Pl. 16) are fairly common but only occur singly or in pairs and usually keep well out of the way. The Oryx is most often seen in the north of Kenya, but is a very wary animal. Sable and Roan are both few in number and restricted to particular localities.

The largest of all the Bovids, next to the Buffalo, is the ELAND, *Taurotragus oryx* (Pl. 13), a great cow-like, almost docile beast which in spite of its size is able to leap into the air with the ease and grace of an Impala. These often occur in herds of thirty or more, and farmers and others have wondered how they are able to keep in condition during the dry season. One answer is that they travel over large areas to select their food; another is found in an examination of their stomachs, where all manner of tough woody herbs can be found and large quantities of Sansevieria leaves. These are tough succulent leaves about two feet in length, with a needle-sharp thorn at the tip. Domestic cattle will not touch them but the Eland swallows the lot, thorn and all, and they can easily be found in its stomach with the undigested fibrous part still attached, looking like pieces of binder twine. In fact, that is exactly what I thought the animal had swallowed when I first examined one.

The vast plains are also the home of many smaller Bovids of

which the most numerous are the Antelopes and Gazelles. As there is some confusion about the word "Antelope" which, strictly speaking, is often wrongly applied, a little explanation may be helpful.

We have already seen that one of the sub-families of Bovids is called *Antilopinae* or "bright-eyed." However the *Antilopinae* are further divided into groups of closely related species called *genera* comprising the Klipspringers, Oribis, Steinboks, Sunis and Dikdiks. In addition *Antilopinae* also contain a division *Antilopini* which, in turn, comprises three *genera*: Impala, Gerenuk and Gazelles. There are two types of Gazelle, the Thomson's and the Grant's. Thus it is incorrect to speak of Gazelles when referring to any but the two laster animals: on the other hand, it is correct to call all the animals in this sub-family Antelopes! Deer don't come into the *Bovidae* at all and are not represented south of the Sahara.

To labour this nomenclature is pedantic, for even the experts are not now quite so sure as they used to be as to where exactly the dividing lines should be drawn, but there would be less confusion if the term Antelope was not applied to such animals as the Sable and Roan which are in fact Hippotrags or "Horse-ears." Perhaps the commonest of these smaller animals, and a jolly little fellow at that, is the THOMSON'S GAZELLE, *Gazella thomsonii* (Pl. 20), known affectionately as the "Tommy." In the past the Tommy occurred in great herds numbering many thousands of animals and took part in the great migrations along the Kenya Rift Valley. They were undeterred by the wire fences of the farms, which checked the Zebra's migrations, but owing to their popularity as a source of food their numbers were soon reduced to a mere handful in this region. Like the Zebra and the Wildebeest, to see them in any number, one must now go to the Serengeti.

Hippopotami by the Kazinga Channel

A fine black-maned Lion in the Ngorongoro Crater

Because of their relatively small size a few manage to exist in most suitable areas but never increase greatly in numbers. This is probably because once a population has been reduced to a certain size inbreeding and lack of mating initiative weaken it and lead to its ultimate extinction unless new blood is introduced.

The Tommy is almost strictly an animal of the open plains and usually shows an abhorrence for bush, avoiding it if pursued and preferring to rely upon its speed and stamina to escape from enemies. It is, however, liable to lose its nerve, so it seems; for if hunted by several people all at once it will sometimes resort to just running round and round in a small circle in front of them.

Their gregarious nature has already been implied but as with all animals of the plains solitary males may be found which have a particular spot out in the open which they always return to. I timed one of these once after chasing it away and he took about two hours to return to the spot.

The breeding season varies from area to area but occurs just before the long rains. The young animals thus have an abundance of food ready for them when they are weaned, that is if the season does not fail. It is said that the pregnant females will withhold the birth of their young if the rains are delayed, but this is a point that has yet to be proved scientifically possible. The new-born youngsters, staggering after their parent, are a charming sight. I once spied one that had obviously only just stood up and drove over to investigate. Long before I was anywhere near the mother had seen me and run off, leaving the youngster crouching in the grass. The grass was brown, about twelve inches high and very thinly scattered, but even so it wasn't easy to find the youngster. Fortunately I had pin-pointed its position fairly accurately; but I found myself staring at it from some six feet away without realising that I was doing so, so well did it blend with the back-

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ground. Of the same colour as the grass, lying curled up and perfectly motionless, and flattening itself against the ground to eliminate shadows, it was perfectly camouflaged. Even when I moved very close to it it made no movement except for the occasional blinking of an eyelid.

Many people, when they find a newly-born animal like this, take it home saying that it was an "orphan" and that the mother had forsaken it. How often does one hear that tale every breeding season! I wonder if those same people would change their minds if they were to hide themselves and watch the mother's return, and her vain search for her baby. For this is the only means of protection that the baby has; it cannot run at this early age and the mother leaves it in order to draw attention away from it. But she has every intention of returning as soon as the danger has passed. By remaining perfectly still, and because (it is said) it has no scent at this age, the young one has a pretty good chance of escaping detection.

It is cruel to remove such youngsters for they are seldom reared to maturity; even if weaned successfully they usually die of stomach disorders. This may be because all plant-eating animals have numbers of minute organisms in their gut which assist them in the digestion of their food; and in the relatively sterile conditions under which captive young animals are brought up they are deprived of these organisms. Thus they are not able to utilise their food properly. It is thought that they inoculate themselves in the first instance by eating some of their parent's droppings; at the same time they will inoculate themselves with unwelcome parasites and so this habit is usually prevented amongst captive animals. Very little is known about these micro-organisms, but it is unlikely that those from a Wildebeest, for example, are exactly the same as those from a Tommy; and the only way in

which an animal can ensure its correct inoculation is by being free.

Perhaps the most amusing characteristic of the Tommy is the way in which it wags its tail. It does not do this from side to side like a dog, but round and round in a complete circle, and it does so incessantly. I heard somebody once say that he thought that they did this because they were always so happy. Certainly it looks a happy little creature, but I suspect that the real reason is to keep flies away.

In colour it is light reddish-brown on the back with a broad black band separating its white belly region. This has been quoted as an example of disruptive coloration; the band serves to break the animal into two distinct halves, attracting one's attention to the black band and not to the animal as a whole. It is thought that this might give the animal that split-second advantage so necessary when a predator appears. The merits of such colouring are difficult to assess, for the male GRANT'S GAZELLE, *Gazella granti* does not possess it (Pl. 20) although the female does. This Gazelle, although very similar, is rather larger than the Tommy and perhaps on this account does not seem to possess quite the same power of cheeky endearment. It is equally at home either on the well-watered plains, or in arid near-desert country; it can survive, one assumes, long periods without water. It is known to feed on succulent plants in arid areas. Of course the ones inhabiting the latter type of country are slightly different in minor features, forming sub-species as we call them, and it is not likely that they range from one habitat to the other. Whether it colonised the plains first or the arid areas is anyone's guess at the moment, although I suspect the latter.

Grant's Gazelles never exist in large herds like the Tommy, yet are much more numerous in many Tommy habitats to-day

than is the Tommy itself. The colouring is much paler and the female possesses a black band, also paler, but the male does not. Obviously disruptive coloration plays no part in the male's life; but pale colours (I repeat) are associated with animals of arid areas and it blends into its surroundings better than a Tommy would. We cannot ask why the female has such a band; it is obviously a sex-linked characteristic that may or may not be of some significance.

The most characteristic Antelope of arid regions, although it is usually called a Gazelle, is the strange-looking GERENUK, *Litocranius walleri* (Pl. 17). Although unknown to modern science until 1878, it was familiar to the Ancient Egyptians some 7,000 years ago, and is pictured in many of their designs.

Gerenuks are handsome animals with a rich brown coat, but they look odd because they have very long necks like miniature Giraffes, and long thin legs. Their long necks enable them to reach a greater range of shoots, an obvious advantage in a dry region. This advantage is carried still further by their characteristic method of feeding, which is to stand upright on their hind legs, balancing only lightly with their fore (Pl. 20). Some other animals will also do this, particularly Goats, but none does it with the poise and grace of the Gerenuk.

The females often travel about in small groups or in pairs, and the males in pairs or singly. Unlike Gazelles, in which both sexes are horned, only the males have horns which are quite massive and tend to obscure the large ears. Most books say that the Gerenuk never drinks water, and specimens kept in zoos never seem to if fed on succulent food, but apparently they will drink each other's urine. For years it was asserted that the Giraffe didn't, so we must still await more concrete evidence about the Gerenuk.

Little is known about it because it is a shy animal, but with patience it can be approached.

Undoubtedly the most beautiful of the herbivores is the IMPALA, *Aepyceros melampus*, an animal of light bush country rather than of the open plain. It is a glorious sleek, reddish-brown colour with enormous limpid brown eyes, and the males possess large lyrate horns (Colour Pl. 4). It is noted for the prodigious and graceful leaps that it makes, and it does this because it mostly inhabits a type of country where lurking enemies cannot easily be seen; at least that's what we think. It could just as likely be to clear obstacles rapidly, or more likely in the hope that a predator leaping at it will miss. Equally plausible is the suggestion that it warns others in the vicinity of possible danger by displaying for all to see the bold black and white rump markings, just like the Rabbit's tail. When one spies an enemy and starts to flee all the others can readily see the warning sign as it leaps into the air above the undergrowth. Impala always look remarkably clean and they never resort to dust baths or mud wallows, even though when they are in the bush you can see them constantly stamping their legs to shake the flies off.

I think that it must feel more at home in light forest country, for I have frequently driven right into the middle of a herd in such a place. They show no alarm whatever if one sits quietly, walking to within a few feet of the car. In the open they are rather more difficult to approach. Nevertheless it is in the open where the breeding herds gather in March in Kenya. During this month I have watched an old male collect together as many as sixty or more females into his harem, to guard them jealously against other would-be suitors. While the old male walked round them, chivying them into a tight bunch, a number of

younger males waited expectantly and hopefully some distance away. The females, bewildered and excited, appeared to resent their treatment, for suddenly they all broke away, running simultaneously in all directions. But the old male, with lowered head and angry bellowing, soon had them all back together again, and violently chased the other young males away who did not stop to challenge him (Pl. 18-19). In such a situation violent fights often ensue and the originally victorious male may end up without any harem at all.

As for the young males that are not lucky enough to secure females, they go about in bachelor herds and presumably have to forgo the pleasures of mating. Fortunately there seem to be always many more females than males amongst wild animals; although at birth the numbers are equal males have a higher mortality rate. The victorious male does not forsake his herd once mating has taken place, but remains with it and keeps a paternal eye on the youngsters when they are born.

Solitary males will often spend long periods of time standing perfectly motionless on an anthill staring into space. I have found, when trying to stalk up to herds feeding near forest, that a sentry covers all likely approaches and always places itself in a commanding position on an anthill or similar eminence. Most herbivores have a habit when suspicious of pretending to graze without actually doing so, and of suddenly flinging up their head to catch you out. Not only Impala, but Tommy and Zebra play this trick, whilst on two occasions I have come across Buffalo that have merely pretended to drink although watching me carefully.

In many parts of Uganda the place of the Impala is taken by the UGANDA KOB, *Adenota kob* (Pl. 14-15), which is very similar; looking in fact rather like a rather stocky version, although taxo-

nomists classify it with the "Horse-ears," the Waterbuck, Wildebeest, Hartebeest and others; in other words, not as a true Antelope at all.

Their numbers were sufficiently dense in certain areas to promote an investigation into them. One of the most interesting observations that came out of this was their territorial behaviour. There was a certain mating area within which a number of males each had a small plot to himself. This was vigorously defended, although those already in residence had a mutual respect for each other, not trespassing beyond the boundaries of their own territories. The territories were quite small, roughly circular and delimited by virtue of the fact that the grass was closely cropped in them; and within these areas the males displayed by prancing when a female appeared. The female entered the territory of a chosen male; mating took place, and the female then left.

It has been suggested that this behaviour may be due to a high population density, but it has only comparatively recently been spotted and indeed similar behaviour may occur with other animals elsewhere. It was only by prolonged and careful observation that this was established here.

The visitor to the plains of Africa will sooner or later see a strange beast running along with its tail held stiffly in the air, giving it a most comical appearance, especially if followed by half a dozen youngsters carrying aerials as well. And what a funny face when it finally stops and turns to look at you, great warts protruding under the eyes and two pairs of vicious tusks on either side of the jaw, the whole framed with a shaggy mane! Yes, this is the WART HOG, *Phacochoerus aethiopicus*, an amusing creature despite its ugly face (Pl. 21).

There are a number of questions that I am invariably asked:

one of them is, Why does the Wart Hog run with its tail in the air (as do also the Elephant and Rhinoceros)? The answer, I think, is simple: Because if they didn't hold it up it would be struck by the back legs as they run; and the tail being rather long and fleshy in these animals the result would probably be very uncomfortable.

This is a cloven-hoofed animal, but a member of the Pig family and thus not a Bovid. It is a common enough creature, often found rooting about on the plains. It seems to be so greedy that it usually kneels on its forelegs in order to stuff food into its mouth more easily. The large protruding bumps under its eyes, not really warts, doubtless serve to protect the eyes as it makes sweeps sideways into the earth with its tusks, digging up roots and tubers. At certain times of the year it is often accompanied by a little yellow bird seeking insects that it disturbs. This is the Eastern Yellow Wagtail, *Budytes flaus luteus*, which comes all the way from south-east Russia to winter in Africa.

Our next animals, the BABOONS, *Papio anubis* (Pl. 23), have no affinities with the other animals that have been described, being of course members of the Monkey family. But they are typical animals of the plain, or rather its fringes, for they never stray too far from the safety of the trees, where they seek refuge should their dreaded enemy the Leopard appear.

They travel about in quite large groups, some of them numbering over a hundred individuals. Moving rapidly over the ground on all-fours they search for insects, roots and tasty plants, stuffing the food hungrily into their mouths as they walk and occasionally sitting down to enjoy a particularly succulent morsel. In this manner they range perhaps two to four miles each day throughout a territory of about three to six square miles in

PLATE 7: *The strange-looking Gerenuk*

PLATE 18–19: *The male Impala collects together as many as sixty or more females into his harem*

PLATE 20: (*a*) *The Gerenuk stands upright on its hindlegs to feed.* (*b*) *Grant's Gazelle in the foreground with Thomson's behind, showing the difference in colouration.* (*c*) *A male Thomson's Gazelle*

extent. They only work over parts of this area intensively; and although the ranges of more than one troop may overlap this does not cause any fighting when they meet. They even drink from the same waterhole together, yet the different troops apparently never mix.

The troops have a very rigid social organisation, being dominated by one or a number of males that are virtually giants in size; dominance is attained by physical force. When moving, the lesser males and some large juveniles go first followed by the females and the other older juveniles. In the centre are the females with young, young juveniles, and the dominant males, followed by a repetition of the forward organisation. When the dominant males stop the troop stops; when they move the troop moves, and as one of them walks along you can see the younger animals run from his path with looks of abject terror on their faces! The adult females are not quite so terrified, but bestow constant nervous glances in his direction when he is near. But unlike many animal dictators, he is not aggressive towards the young animals, although his slightest rebuke will send them running away screaming like petulant children. There is no animosity between the dominant males either, and they will often band together if one of their members is threatened. Whenever a squabble starts in the troop the appearance of one of these males is usually sufficient to quell any further disturbance, and so peace is maintained without any blows.

The adult females are receptive for mating about a week in each month and when this occurs they first offer themselves to the subordinate males and older juveniles, and then later to the dominant males. No display by the males is indulged in, all the initiative in this process being taken by the females. But towards the end of the receptive period the dominant males become much

more interested and may pair up with the female for a few days, fighting off any other would-be suitors. It should not be thought from this that the Baboon's life is one long orgy of amorous activities, for the adult females are either pregnant or lactating for most of the time and thus reception by the males cannot be frequent. Doubtless their easy relationships with all the orders of males within the troop leads to social harmony, as the subordinate males have no jealous initiative to challenge the dominant males.

When the troop makes a halt the young members usually set up a fine row, squeaking and squabbling as they play with one another, such games often ending with one of the very small ones running screaming to its mother. A new-born baby is black in colour with a red face, unlike the olive colour of the adults. At this early stage they cling tightly to the underside of the mother but later often like to ride on her back in the manner of a jockey (Pl. 24). Should anything untoward happen they immediately revert to their former position.

Occasionally a big male will indicate to a female that she is to attend him, and loll back languidly holding out an arm or a leg whilst she dutifullly grooms his fur and searches for parasites. Baboons are always doing this among themselves and for this reason they are actually amongst the cleanest of wild animals. In captivity they are noted for lousiness, and this is probably why they are thought to be dirty in this respect in the wild.

Baboons are more at home on the ground than any of the other African monkeys, yet they never use an upright gait, only occasionally standing up on their hind legs to look for enemies. They are quite at home in the trees as well and always retire there as soon as it begins to get dark, seeming greatly in fear of the Leopard. That the latter exerts an influence on their numbers has

been proved by the big increase of Baboons in areas where Leopards have been eliminated.

Also belonging to the Monkey family are the noisy little Black-Faced Vervets, or Green Monkeys, *Cecopithecus aethiops*, commonly found in any large clump of Yellow Fever thorn trees at the edge of the plains or along a watercourse. These are true arboreal types although sometimes seen on the ground. Nothing seems to be known about the social organisation, if any, of these Monkeys. But one thing the observer will not fail to miss is the bright blue and red genitalia of the males, indicating that vision plays an important part in their mating habits.

Birds form such a characteristic community of their own that on the whole they have been omitted from this book, but the OSTRICH, *Struthio camelus*, is such a typical inhabitant of the plains that it deserves mention.

This enormous, flightless bird is a common sight as it waltzes imperiously through the grass, its scrawny pink neck held aloft bearing a ridiculously small head, and its fat, naked thighs, surmounting long pink legs, add the finishing touches to this odd-looking beast. The Ostrich is a vegetarian and as it moves it constantly bends its neck down, always holding the head more or less parallel to the ground, as it searches for titbits.

Pairing takes place in the breeding season and they scrape a rough hollow in the ground out in the open, into which some twenty large eggs are laid. The hen bird, whose plumage is a speckled greyish-brown, sits on the nest by day, and the cock, in dirty black and white plumage, sits on it at night. Whilst sitting the birds extend their necks along the ground. This changing over has been argued in favour of the theory of protective coloration, for the colour of the hen blends beautifully with the background

during the day, whereas the cock bird would be most conspicuous. But one writer stated that this was nonsense as the cock bird frequently mounts the nest before dark and leaves well after dawn, but we must not try to credit them with too much intelligence, their actions would seem to be a step towards increased survival rate whether they have perfected it or not.

The little fluffy chicks hatch with the same speckled plumage as the hen, which the cock birds do not lose until they are quite large. The comparatively gigantic parents show touching care for their tiny chicks as they shepherd them cheeping through the grass, preferring where possible to move them along the open surface of a road where they can't get lost so easily (Pl. 22). Many doubtless are lost at this stage although I have seen quite large broods reared to a respectable size.

The parent birds do not hesitate to defend their offspring should one attempt to get too close to them, but the Ostrich is a wary bird at all times and not easy to approach. Its long legs can carry it at remarkable speed if it becomes alarmed. Those who are sceptical of the feasibility of domesticating wild African animals should stop to consider the enormous success that attended Ostrich farming when their feathers were at a premium, yet it looks the least likely of the plains animals that one could domesticate.

Not the least interesting thing concerning this bird is the fact that it is parasitised by a species of louse closely related to a species found on the South American Rhea, a similar flightless bird. Not only do they share this parasite but also a tapeworm found in no other birds, and two species of mite, surely convincing evidence that these birds must have come from a common stock and taken their parasites with them.

CHAPTER THREE

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THE PREDATORS AND THE SCAVENGERS

Lion—Leopard—Cheetah—Hunting Dog—
Hyaena—Jackal—Vulture—
Marabou Stork

THE PREDATORS AND THE SCAVENGERS

The animals which live by killing, the carnivores, are nowhere more impressively exemplified to-day than in Africa.

The niche of each species is well defined and they show a great diversity in structure to fit each for its particular mode of life. They fall into three main groups: the cats, dogs and Hyaena. All are unguiculate or clawed mammals, and adaptations for a carnivorous existence are clearly evident in the tooth structure. The incisors are almost rudimentary, whereas the canines are greatly enlarged for piercing and seizing prey. In the herbivores it is the molar teeth which show their greatest development because of the excessive grinding that is required of them. In addition the Lion and the Leopard both possess large curved claws for seizing, and are able to withdraw them into a sheath for protection when not in use. The Cheetah does not use its claws to seize prey and thus they have no sheath to cover them, as sharp points are not important; but they are not rigid and non-retractile like those of the dogs.

Without doubt the most well-known of these African predators is the mighty LION, *Panthera leo* (Pl. 25–30), once an all too familiar figure of the bush and plain but now rapidly dwindling in numbers owing to man's never-ceasing destruction, since wild carnivorous animals are not considered to be compatible with the keeping of domestic stock.

Strange as it may seem, it is the most primitive of the three

big cats in the skull and skeletal anatomy. It differs markedly from the Leopard, which is of normal type, and from the Cheetah, which shows a high degree of specialisation. Compared with those of these two animals its teeth are relatively quite small. Possibly such primitive features that it possesses show its relative success over the other two, since it found no need to specialise; used together its claws and teeth are quite adequate. They are not as strong as those of the Cheetah, which must rely entirely on the work of its teeth once it has seized its prey.

The Lion is the biggest of the three and therefore the strongest, although weight for weight the Leopard would probably hold pride of place. It gives one every impression of being incredibly lazy and always loth to use its strength, merely exerting the minimum amount of effort required for the occasion. I once watched, in the Nairobi National Park, a fully-grown Lioness dragging away a tiny Wildebeest calf that it had killed, with the most ridiculous stertorous gruntings and blowings, frequently tripping over its tiny burden and seeming to be only just able to carry it along (Pl. 27). Yet there is no doubt that the same Lioness could have dragged along a fully-grown Buffalo carcass if she had wished to.

While I was driving around on the floor of the Ngorongoro Crater in Tanganyika an example of the reluctance of the Lion to exert itself was demonstrated to me. A Rhinoceros appeared to be very interested in a pair of black-maned Lions that were quietly resting out in the open. When I arrived on the scene the Rhino also showed a lively interest in me, so I thought that I would hurry things up by driving round behind the Lions to see what would happen. In this position I waited as the Rhino gradually worked its way towards them, bending its head this way and that as it tried to get a clear view. I expected the Lions

to take the offensive and was surprised to see that, when the Rhino arrived within about twenty feet, they began to snarl and grunt their displeasure. Undaunted the Rhino plodded forward, head lowered and horns presented ready for trouble. Surely its death was imminent? But no: with more snarling and grunting, the Lions suddenly got up and slunk out of its way, whereupon the Rhino made a short rush at them and they ran off!

But more was yet to come. Not far away another large, black-maned Lion was resting with its Lioness, and the Rhino now made unerringly towards them. Much the same preliminary procedure then followed as it slowly plodded forward, turning its head this way and that, twitching its ears and blowing down its nostrils, until it was within a few feet.

This time the Lioness was the first to start expressing displeasure by grunting and snarling, and then, of all things, she went through motions similar to those performed amongst Lions preliminary to mating. At these demonstrations the male became very aggressive, and began to run backwards and forwards snarling and grunting. Suddenly it rushed over to one of the other Lions that happened to be walking along quite quietly about thirty yards away. Rearing up at it the former snarled and snapped ferociously but, terrifying as this display seemed to the onlooker, the attacked Lion did not seem greatly impressed, merely snarling back and walking away. The Lion then rushed back to his Lioness, and by this time the Rhino was almost on top of them. At this point the Lioness suddenly got up and moved off, followed by the male. Again the Rhino made a rush at them to hurry them on their way, and after following for a little gave up and continued grazing. The Lion and his mate then sat down as if nothing had happened! (Plate 29.)

The interesting thing about this episode was the behaviour of

the Lioness. This appeared to be a display of sex psychology, telling the Lion to "be a man" and to do something about the Rhinoceros. The Lion for its part was prepared to assert itself by tackling anything except the Rhinoceros, as was shown by its unnecessary attack upon the other Lion.

Lions do sometimes kill Rhinos; there are several examples on record, one in Ngorongoro Crater itself; but their unwillingness to exert themselves was, I think, well shown on this occasion.

There is some speculation whether the Lion hunts by sight or by smell. I think that it is mainly by sight, with smell as an accessory during the day, but obviously the primary method at night.

I once watched a pair of Lionesses stalking a Giraffe that was feeding amongst some thorn trees. With eyes fixed unwaveringly upon the prey, one of them stalked carefully forward like a lithe shadow (Pl. 27). Every so often the Giraffe would suddenly stop chewing, and at this the Lioness instantly froze like a statue. Even though it was a good thirty yards off she was able to see and interpret the slightest change in its behaviour. If a paw was poised in mid-air it was held there until the animal started chewing again. Chewing resumed, the Lioness did not then rush forwards to the next bush but proceeded so slowly and carefully that one could hardly discern that it was moving at all. It was a remarkable and fascinating sight to watch it moving so slowly and yet so rhythmically, perfectly balanced and without a sign of a jerky movement, so that if the Giraffe did notice the tawny body it might quite well mistake it for some inanimate object. However, for some reason the Giraffe seemed to be uneasy; perhaps it was my presence or, more likely, they are always alert when feeding in thickish cover where the field of view is obscured. It eventually moved off and the Lioness abandoned the stalk.

This display was typical of the characteristic method of hunting of the Lion, which is first to get as close as possible to the prey, and then to make a final dramatic rush at great speed, a rush that usually leaves the Lion pretty breathless for further pursuit.

Some doubt has been cast upon a method of killing which has captured the imagination of many writers. This consists of the male walking upwind of the quarry and allowing its scent to drift down, accompanied by a great deal of roaring. The prey then stampedes madly away from the direction of the male on to the waiting Lionesses who are downwind in ambush. Whether this is the commonly adopted method at night, as has been supposed, is difficult to know; certainly Lions roar a great deal when it is dark. Animals of course have a habit of not doing the things that they are supposed to do, and when one scientist placed a life-size dummy Zebra in front of some Lions it was the male who was first to attack it and not the females.

Once the male is adult, at about four to five years, it usually no longer takes a very active part in hunting, which is left to the females that accompany it. By the time that it is ten years old it is probably quite incapable of catching an animal with its characteristic rush, and at the age of fifteen its span of life is finished. The maximum age of the Lion has been put at twenty-five years, but it is more likely to be fifteen. Thirteen years is the average age of captive animals. A well-informed African in Tanganyika told me that he thought it to be about fifteen, and furthermore that if he was on foot a ten-year-old lion would not be able to catch him running. He did not give a demonstration of this!

Although they frequently kill in the early morning and late evening there is no set rule; they usually kill whenever an

opportunity presents itself. I have witnessed a kill which took place at exactly midday. Lions kill only to fulfil their immediate requirements, gorging themselves upon a carcass until completely sated. They do not bother again for a few days. The herbivores upon which they prey seem to be aware of this and if a Lion is clearly visible they graze without fear nearby. There is no such thing as the constant war and fear that are so often thought to be a part of these animals' lives. It is only when the Lion is not clearly seen or is moving about that the pattern of behaviour changes. Then the herbivores communicate with one another, expressing their alarm with loud snorts that reverberate over the plains, and they start to follow the Lion's movements carefully.

In an area of long grass in western Uganda I came across a herd of about two hundred Topi all staring at a fallen tree. Driving up to investigate, I found that it was a Lion that they were watching and, as it moved off at my approach, so the whole herd followed its progress through the grass. If its position became uncertain in a particularly long patch then they all wheeled round and galloped away a short distance, only to stop and stare again. If they didn't succeed in locating it again, then they all galloped away to what they thought was a safe distance. Little wonder the Lions take such small notice of the hordes of cars that follow them in popular parks like the Nairobi National Park; they must be as used to this sort of attention as a famous film star!

Should a Lion kill a member of a herd of animals in daylight the rest do not flee madly in panic, but invariably stop and watch the procedure before wandering slowly off. When I witnessed the killing of the baby Wildebeest, already mentioned, a group of adults with their calves were licking salt in a quite open patch of ground. Suddenly, so fast that the eye could hardly follow, a tawny body streaked out of the low grass at the edge of the salt

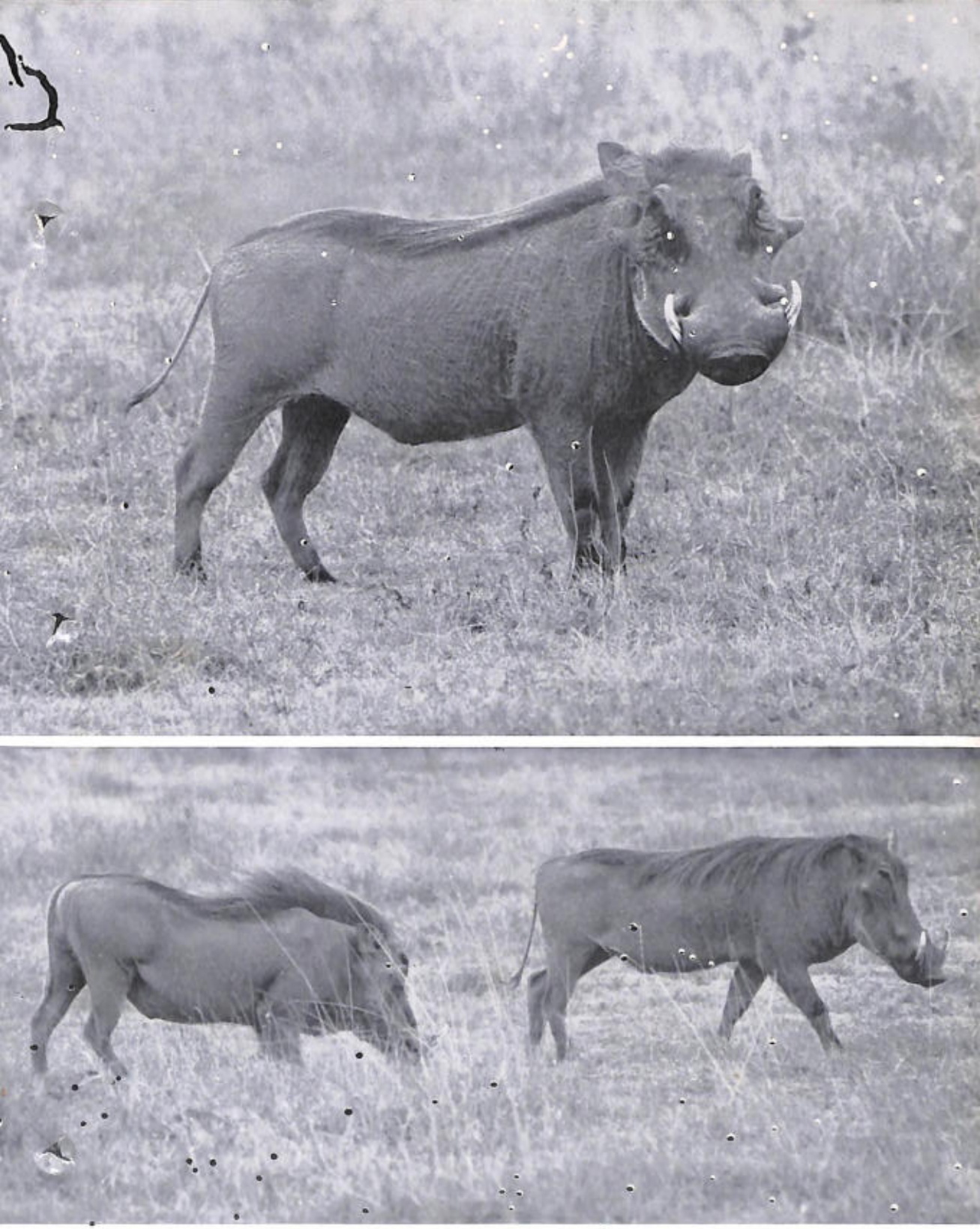


PLATE 21: *"What a funny face when it finally stops and turns to look at you!" The Wart Hog*

PLATE 22: *This pair of Ostriches (one is almost hidden) prefer to move their chicks along a road where they cannot get lost so easily*

pan, but fast as it was, the Wildebeest had already started running the moment it appeared. The little calf, however, could not keep up with the others and soon the Lioness was running over it knocking it to the ground with her massive paws. She carried on a few feet in pursuit of the others but soon stopped, and as soon as she did so the Wildebeest stopped as well, only a few yards away and snorting their disapproval. At this the Lioness made a feint at them which drove them back a few more feet, and then carried off her victim under the reproachful stares of her disapproving audience. Panic? Fear? It didn't look like it: merely an acceptance of something inevitable.

A Lion when walking along would probably kill any small animal that was foolish enough to remain in its path. I once watched a pair walking after two Wart Hogs. The latter, in exactly the same manner that they adopt when followed in a motor car, would run away for a little distance, and then stop and stare, waiting until the Lions were very close. One of the Lions would then make a half-hearted rush and the Wart Hog would turn with alacrity and make off again, only to repeat the performance. Needless to say, the Lions never caught up with them. Well-fed Lions may become sloppy in their hunting methods, not infrequently only wounding an animal. When they are really hungry, and have gone without food for a week or more, they hunt more earnestly.

They are very gregarious when young and individuals of all ages may be met with in a pride; some prides number as many as twenty or thirty all told. When such large numbers live together they must kill cleanly if they are all going to eat well. In areas where prey is not plentiful they may go for several days without making a kill, and one can then see them with their ribs showing through the skin.

The animals upon which they prey have great powers of self-preservation. I have already referred to their instantaneous flight, but even if a Lion catches them they are not necessarily doomed. Two years or so ago, in the Queen Elizabeth National Park of western Uganda, I saw a Defassa Waterbuck that had been attacked by a Lion but had escaped. The Lion had evidently landed on the Waterbuck's hindquarters, tearing them open, and it appeared to be so badly injured that the game official in the area set out to kill it, but was unable to do so. Three months later, when I saw it, the back was completely healed, although deformed, and the animal was able to move about with normal agility (Pl. 16).

A very clumsy kill was witnessed in the Nairobi Park when three young Lions killed a mature Wildebeest very slowly. They had great difficulty in bringing the animal to the ground, and were unable to deal a killing blow, eventually eating it alive. The kill of a Lion is normally alleged to be done by its leaping on to the shoulders of the prey, if large, and breaking the neck by seizing the muzzle in its paws and pulling it sharply back. The broken necks of cattle killed by Lions testify to this fact. These young Lions did not do this. They took the Wildebeest unawares, pounced upon it, and relied upon their teeth. Their inability to kill properly thus demonstrates the weakness of the Lion's teeth which I mentioned earlier.

As to the food preferences of Lions I don't think that they have any. Like most carnivores they are opportunists and take whatever comes their way. They have even been reported as eating Cheetah, Hyaena and birds, and they will not turn up their nose at a dead Hippo. In many regions Wildebeest are said to be their most popular prey; but as Wildebeest are invariably the most numerous animals it is hardly surprising that a greater

percentage are killed. The criterion is most likely the frequency of the species.

In the Kigezi District of western Uganda there is an unusual population of Lions that habitually climb trees, although it is generally held that Lions are unable to do so. Indeed, the very arrangement of its muscles shows that a Lion is not skilled in this habit as is the Leopard, which has more flexible forelimbs. But anyone who has witnessed the speed of their ascent in trees in this area, as I have done, will realise the futility of attempting to climb a tree to escape from one!

The area where they indulge in this habit consists mostly of open, rolling grassland, savannah as it is often called, dotted here and there with wild fig trees and the occasional acacia thorn (Pl. 28). The fig trees have stout boles and are mostly favoured by the Lions, although they have been observed in the thorn trees as well. I have seen a Lioness quite at home on a branch in one of these fig trees a good twenty feet from the ground, and beautifully concealed. The strange thing about the Lions in this area is that, if one finds them lying in the grass, they will often run off and climb a tree. An African guide who accompanied me, and who knew the area well, would approach them on foot and unarmed when they were on the ground, but warned against a close approach to the trees that they occupied, insisting that they would jump on to one if the opportunity were given.

The area is characterised by immense herds of Kopi that roam the plains (Pl. 2), and it is doubtful if the Lions go hungry for long. But although there are many areas in Africa where the grass is just as long, and longer, the tree-climbing habit seems to be peculiar to this spot. Young Lions frequently scramble about in the lower branches of trees that are close to the ground, and even Cheetah have been seen to rest in low branches; but seldom

does the Lion show such an ability to climb about in the higher branches of a tree.

I have previously emphasised the apparent laziness of the Lion and its unwillingness to exert itself; and there has been some attempt to use these traits as justification against the opponents of keeping animals in zoos. It is not my intention to discuss the rights and wrongs of that here, but it is a popular fallacy that a Lion, if well fed, will stay in one place all the time. In fact, they move about quite a lot and sometimes, for no apparent reason, suddenly leave an area of plenty and move into another where prey is scarce. I can only suggest that they like to patrol their area occasionally and, as this may be a good thirty square miles in extent, it can involve a lot of walking. If a strange Lion is met a fight may take place, but they do not defend their territory vigorously against others, even though amongst some prides the territory seems fairly well defined. Others that, for instance, follow the migrating Serengeti herds obviously lay no claim to a particular territory, whilst numerous isolated groups seem to live quite amicably within the confines of the Ngorongoro Crater. On the other hand, we have the case of two young males who took up residence in the Nairobi Park and began systematically to drive away all the other males by joint effort. Far more information is needed concerning this subject, for although the Lion may appear to be primitive in its general characteristics it seems psychologically to be a very advanced animal.

Although an elderly male and female may pair up, Lions do not as a rule mate with one animal for life as has been suggested. When a Lioness is on heat it has been observed in the Nairobi Park that strange males come visiting from several miles away to pay court and this no doubt results in a certain changing round of husbands. In fact, there is one well-known Lioness in this

park that regularly gives birth to her offspring and abandons it immediately to associate with the males, an unusual trait that has earned her the name of "Whore" amongst the African rangers.

It is quite touching to watch friendly Lions meet. At first sight both parties are tense and alert, ready for instant trouble, and then, suddenly, when recognition is made, they run eagerly towards one another, rubbing their cheeks together and kissing with their noses. Affection is not always demonstrated in this manner, amongst lovers in particular it consists of snarling.

The females come on heat throughout the year and it is not an uncommon sight to see them mating. The two animals may be lying down when the male suddenly gets up and perhaps touches the female lightly on her haunches with his paw. The violence of her rejection at this stage should be enough to put any would-be suitor off, but the Lion knows the value of perseverance and is undeterred by her angry snarl and flashing claws. Invariably she gets up and walks off, while the male doggedly follows her, perhaps attempting once again to paw her and being rebuffed even more violently. This may go on for quite a time and then, all of a sudden, the Lioness lies down and acquiesces. The mating act takes only two or three seconds after which the female rolls over on her back in obvious enjoyment while the male usually just stands and looks into space (Pl. 30). After perhaps half an hour's rest the male makes another advance, only to be met with the same violent refusal as before; but eventually the female succumbs and in this manner the mating act is carried out several times during the day.

Ferocious and dangerous as it all appears to us, the wielding of sharp claws and the snapping of teeth seem to hold no fears for the Lions themselves. Probably the Lion's mane protects his

neck from danger when fighting. One writer has suggested that the mane has been evolved by a process of natural selection because it attracts females, and that a Lion without a mane would be such a pitiful object in their eyes that it would have no chance of mating. We know that this is not true, because artificial selection by hunters has greatly decreased the numbers of maned Lions and there are plenty of almost mane-less males that seem to fare well enough.

It is sometimes remarked that Lions in zoos have much finer manes than their wild counterparts, and one explanation is that hairs are pulled out by thorn bushes. But do they have better manes? Certainly the black-maned Lions of the Serengeti Plains seem to have just as fine manes to me as any zoo inmate. But it is possible that the colder temperature in English and continental zoos produce a more luxuriant growth of hair merely to keep the animal warm.

Strange is the habit of some Lions when it is going to rain. They frolic about, sometimes trotting along and then flinging themselves down and rolling over in ecstasy. When it actually does rain their attitude changes; when they are wet and bedraggled they look far from happy. How such a change in the weather can please them is thus hard to imagine.

The greatest frolicking of course is among the youngsters—always an endearing sight—but, careful and gentle as the mother's attentions may appear towards her offspring when at rest, their life is perhaps the hardest of the whole pride. For when a kill is made the adult male or males feed first, then the females, and lastly the youngsters. When food is scarce the youngsters go hungry, and being in the greatest need of food for their development they are the first to die. The advantage of this system, cruel as it may seem, is that a check is kept against the Lions outgrowing their

food supply. If the hungry youngsters try and feed alongside their elders the latters' tenderness towards their offspring soon vanishes and some are knocked out of the way with such violence that they somersault through the air. What a difference in behaviour to the happy family associations that one usually sees portrayed!

To me the LEOPARD, *Panthera pardus*, is the most beautiful and graceful of all the carnivores. Even though its face may not always bear a very benign expression, the colour of its sleek coat and its sinuous movements certainly put it at the top. Although it is considered to be a more advanced creature than the Lion, the spotted coloration of its coat is thought to be a primitive feature which is borne by most carnivores at birth, but grown out of by the majority. This is well shown amongst Lions, some groups of which retain their spots until quite late in life. But for the lurking habits of the Leopard, which either hunts at night or leaps on to its prey from a place of concealment in a tree, the spotted coloration suits its purpose admirably against the dappled sunlight of its habitat (Pl. 31).

Little is known about the normal habits of the Leopard, although it is much more common than is generally supposed. It is far more audacious than any of the other carnivores; it frequently searches for dogs, a favourite item of food, in the midst of built-up areas. But it is a furtive and cunning creature of the night and it is only in remote areas that it is likely to be seen in the daytime. Here it is not so shy and often suns itself in the early morning or late afternoon, perched high in a tree or upon some rocky ledge.

Although well able to it seldom hunts the larger herbivores, usually confining its attentions to animals about the size of a

Thomson's Gazelle. Baboons are said to be its favourite prey, but like all carnivores it will eat anything. The Leopard is regarded by many as a wanton killer, slaughtering far more than it requires for food. It certainly does so with domestic animals should it get into a cattle or sheep enclosure, but it does not have such a chance in the wild. The wrong interpretation may have been put upon the Leopard's actions, since it is one of the few wild animals that makes provision for itself against the future. When it kills a number of domestic animals it probably has every intention of coming back again and again to eat them, for meat must be pretty "high" before the Leopard will turn up its nose at it. Thus its actions could hardly be described as sheer lust for killing. Leopards' larders can often be found in the bush, usually consisting of an Antelope or Gazelle impaled in a thorn tree high above the ground, where, for some unknown reason Vultures will not touch it, although they sit round it in the adjacent trees. Records of quite large animals being carried high up into trees provide ample testimony to the great strength of this animal. It kills its prey by biting with its strong teeth and does not make such a mess of the job as the Lion.

There seems to be no love lost between Lions and Leopards, and there is one report of a Lioness pursuing a Leopard into a tree—the Leopard was able to climb far out of the Lioness's reach. I doubt whether they ever come to grips as the Leopard is far too agile a creature to let itself be easily cornered. Nothing seems to be known about their mating and the care of their young, as they hide away at such a time; and woe betide the incautious naturalist who would beard the Leopard in its den!

Many tales are told of its ferocity and its unprovoked attacks on man, but the old male that I was able to photograph in the

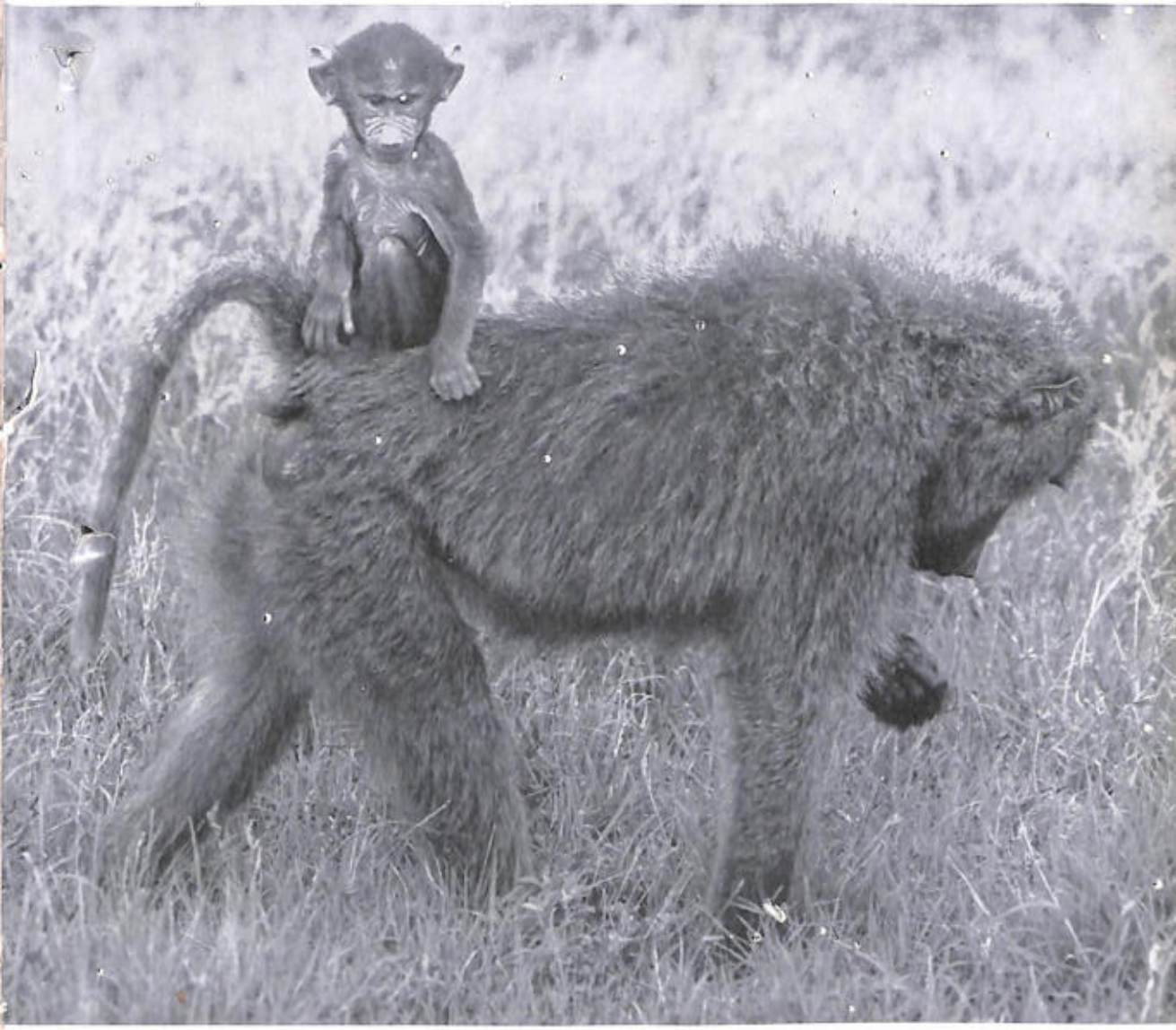


PLATE 23: *Young Baboons often ride on their mothers' backs like jockeys*

PLATE 24: *A female Olive Baboon with young*

Serengeti belied all these accusations by allowing me to approach to within thirty feet of its perch in the tree without taking the slightest notice.

The third and most spectacular of the carnivores is the CHEETAH, or Hunting Leopard, *Acinonyx jubatus* (Pl. 32), an animal often confused with the Leopard because of its spotted coat but nevertheless quite distinct. As is well known, this animal relies almost entirely upon speed for catching its prey and is credited with being the fastest terrestrial mammal there is. It is capable of reaching speeds of something like sixty miles an hour over short distances, but extravagant claims above this figure can be discounted.

The habits of the animal are reflected in its very specialised build which is long and thin with a deep chest, long legs and a small head. Some people confuse it with the dogs; but although its specialisations for speed are away from the general pattern of the cats, it is more cat-like than dog-like.

Its wrist has only a limited mobility and there is also a tendency to restrict the fore-limb to a backward and forward motion only, of great value when the animal is moving at high speeds, as is also the lack of ability to rotate the fore-limb. This also saddles its bearer with certain disadvantages in hunting, because it cannot turn quickly, as we shall see.

The Cheetah is often described as the "most ruthless hunter of the plains," for once it sights its quarry, with its superior speed, the prey has no earthly chance of escape. Such an assumption is quite wrong and arises, characteristically enough, from divorcing the animal from its environment.

Most of the animals of the plains when pursued, whether by man or by beast, run in a zigzag manner, weaving from side to

side. The hunter, trying to sight a fleeing Gazelle with his rifle, probably thinks what wonderful intelligence the animal has as he tries to aim at the zigzagging form. In fact, this has nothing to do with the animal's intelligence; it is merely a logical state of affairs caused by the arrangement of its eyes.

All the herbivores have their eyes situated on the side of the head, which gives them an all-round vision of great value when grazing. Vision is, however, best at the side and not so good in front or behind where they are looking out of the corner of the eye. Thus when the animal runs from a pursuer it turns from side to side in order to get a better view of what is following. So it proceeds in a zigzag manner, which is more easily accomplished than by just abruptly turning the head. By this means it not only sees the pursuer more clearly and judges its distance away, but it also sees the path in front of it better. I should think that most people have seen this when a Rabbit runs in front of a car at night, and nervous racehorses will also often try to run with their heads sideways. Such behaviour applies to single animals only. When they are in a herd the whole lot usually runs straight forward and then perhaps they will all stop and turn round to look, relying on the concept of safety in numbers. Even if hotly pursued, animals in herds seldom weave but run straight ahead, following the leader all the time.

Bearing this state of affairs in mind, let us analyse the Cheetah's pursuit of its prey. The latter will almost certainly weave from side to side as it is being chased. If it moves to one side at the very moment that the Cheetah is about to seize it, which will probably be due more to luck than to judgment, the Cheetah, because of the inflexibility of its fore-limbs, coupled with the speed at which it is travelling—doubtless the maximum at this point—cannot also swerve to catch its prey and will go hurtling

past. Furthermore, it cannot stop any more suddenly than can a motor car at high speed; and so, by the time that it has slowed down and turned round, the quarry will be well away in another direction. It is doubtful whether the Cheetah will immediately give chase again as they usually exhaust themselves when making their tremendous effort, and sit blowing and panting for several minutes.

A logical sequence of events thus ensures that an animal has as much chance of escape, and maybe more so, from a Cheetah as from any other carnivore if it sees it coming. Like the Lion the Cheetah will sometimes stalk close to its prey first and it may then be on top of it before it has a chance to run. Once on top of it, its method of killing is to throw the animal over and seize its throat, strangling or biting through the jugular vein. Small Antelopes and Gazelles are the usual victims, but it will sometimes attack larger prey such as Zebra and Wildebeest; this is particularly true of the older males.

Owing to its method of hunting it is an animal of the open country and can be found during the day either lying out in the grassland or resting in the shade of a tree, but it is seldom found in thickets. Old males often team up together in pairs and this may be due to the fact that if a Cheetah suffers an injury, particularly to its legs, then it is severely handicapped.

Cheetah never try to attack man and are fairly timid animals, yet they seem to be rapidly disappearing from the African scene. Perhaps the cause is the relative scarcity of prey in existence to-day which means that the young animals that have not attained the speed of the adults find it difficult to capture. It would not be the first time that over-specialisation has caused the extinction of a species with a change in conditions. Yet it seems to have existed in some of the more arid northern countries long after much of

the other larger wild life had disappeared. This may in part be due to its domestication by the Arabs who train them for hunting, although a number of those supplied to eastern potentates these days are captured and trained in Kenya by a European.

The HUNTING DOG, *Lycaon pictus*, is rated by the majority as the most destructive and cruellest carnivore of the African plains. It is difficult at first sight to find anything to say in its favour, except that it has its place in the environment the same as the other animals. Its true interrelationship has never been worked out, but it may play a part in keeping the numbers of smaller herbivores, such as Impala, in reasonable numbers in areas where they would otherwise increase too quickly.

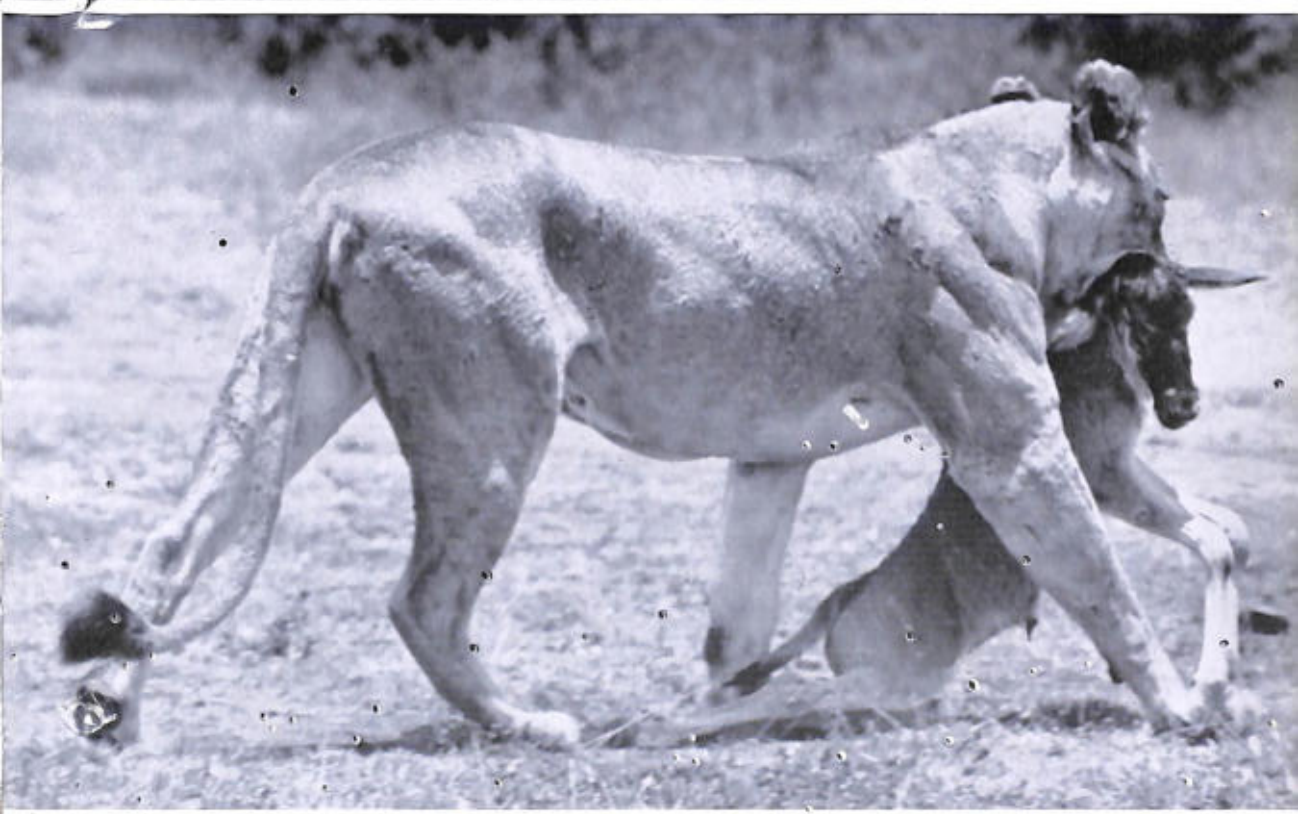
As soon as a Hunting Dog appears on the scene (Pl. 34) all the animals in sight begin to scatter and move out, but they soon return again apparently none the worse for wear. Hunting Dogs are itinerant creatures and seldom stay in any one place for long; indeed, if they did they would soon starve because nothing else would stay there! They seem to be very susceptible to a disease, said to be canine distemper, and soon die off if their numbers become large; so that they do not represent such a threat to other animals as they might appear to do at first sight.

Their manner of hunting has been frequently described and displays a great sense of intelligence and co-operation on the part of the animals, which hunt in packs or in family groups. Once a victim has been selected, which seems to be the first animal to run when they appear on the scene, they pursue it relentlessly. One animal takes over the chase, leading the pack, and when it tires its place is taken by another and so on until the prey is exhausted. When close enough to it they snatch mouthfuls of flesh from the fleeing animal, so that it is soon in a pretty poor

PLATE 25: *An old battle-scarred Lion of about ten years*

PLATE 26: *A Lioness; notice the engorged female tick on her face which is just ready to drop off*

PLATE 27:
"With eyes fixed unwaveringly upon the prey, one of them stalked carefully forward"



"A fully-grown Lioness dragging away a tiny Wildebeest calf that it had killed"

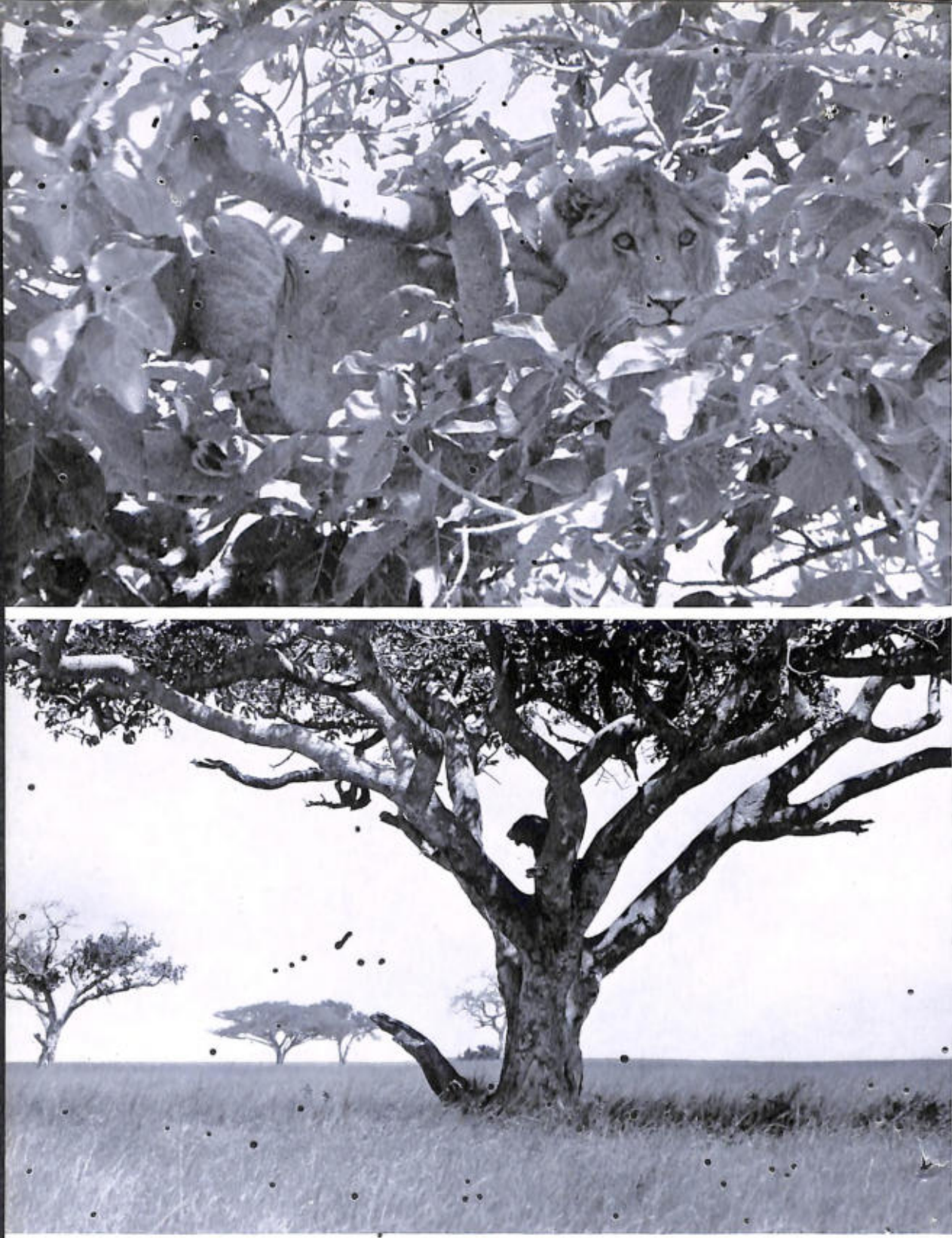


PLATE 28: *"A Lioness quite at home in a fig tree, a good twenty feet from the ground"*

BELOW: *Rolling grassland, and a Lion in a fig tree*

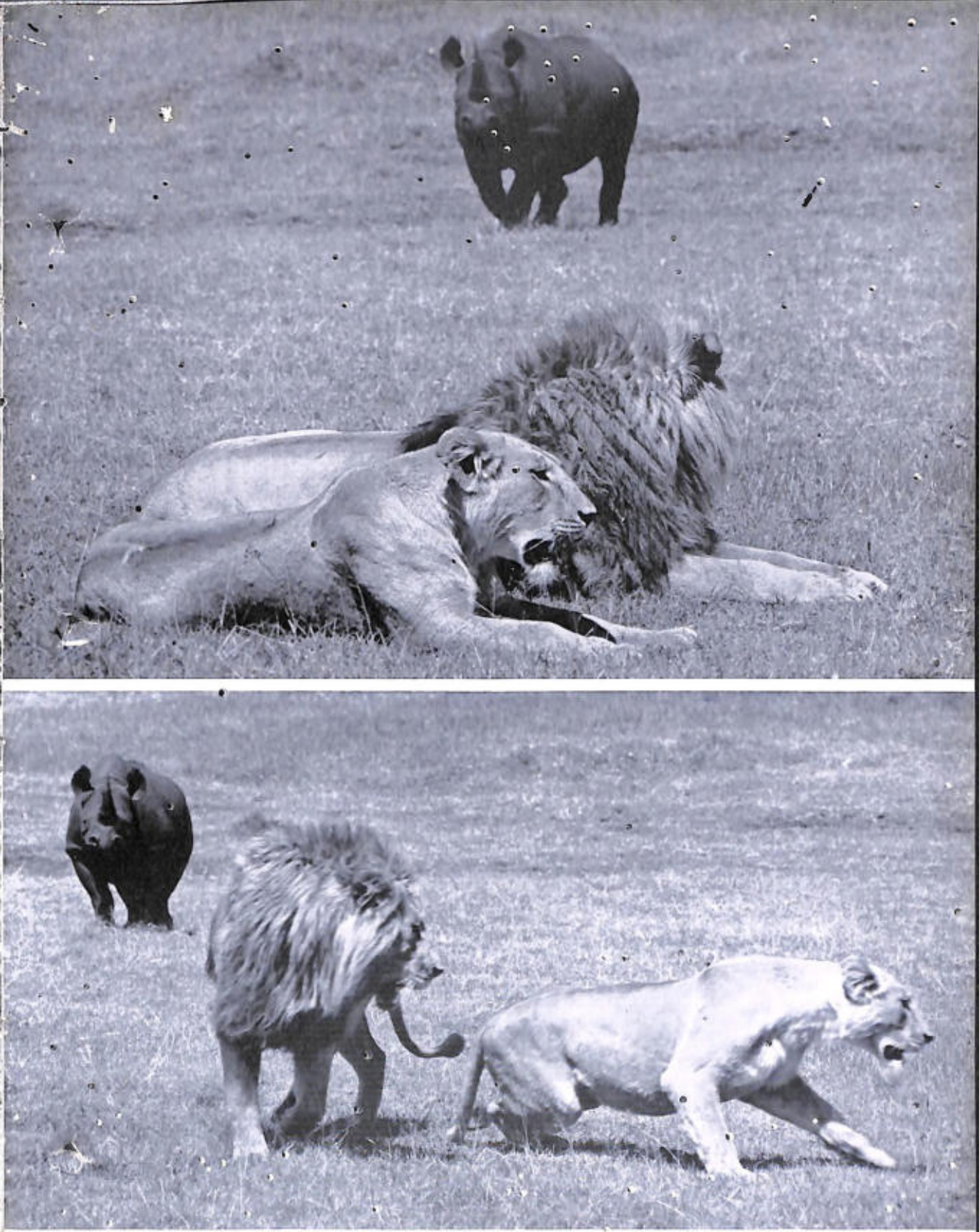


PLATE 29: "*Another large, black-maned Lion was resting with its Lioness, and the Rhino now wade unerringly towards them*" (*see page 65*)

BELOW: "*The Lioness suddenly got up and moved off, followed by the male*"

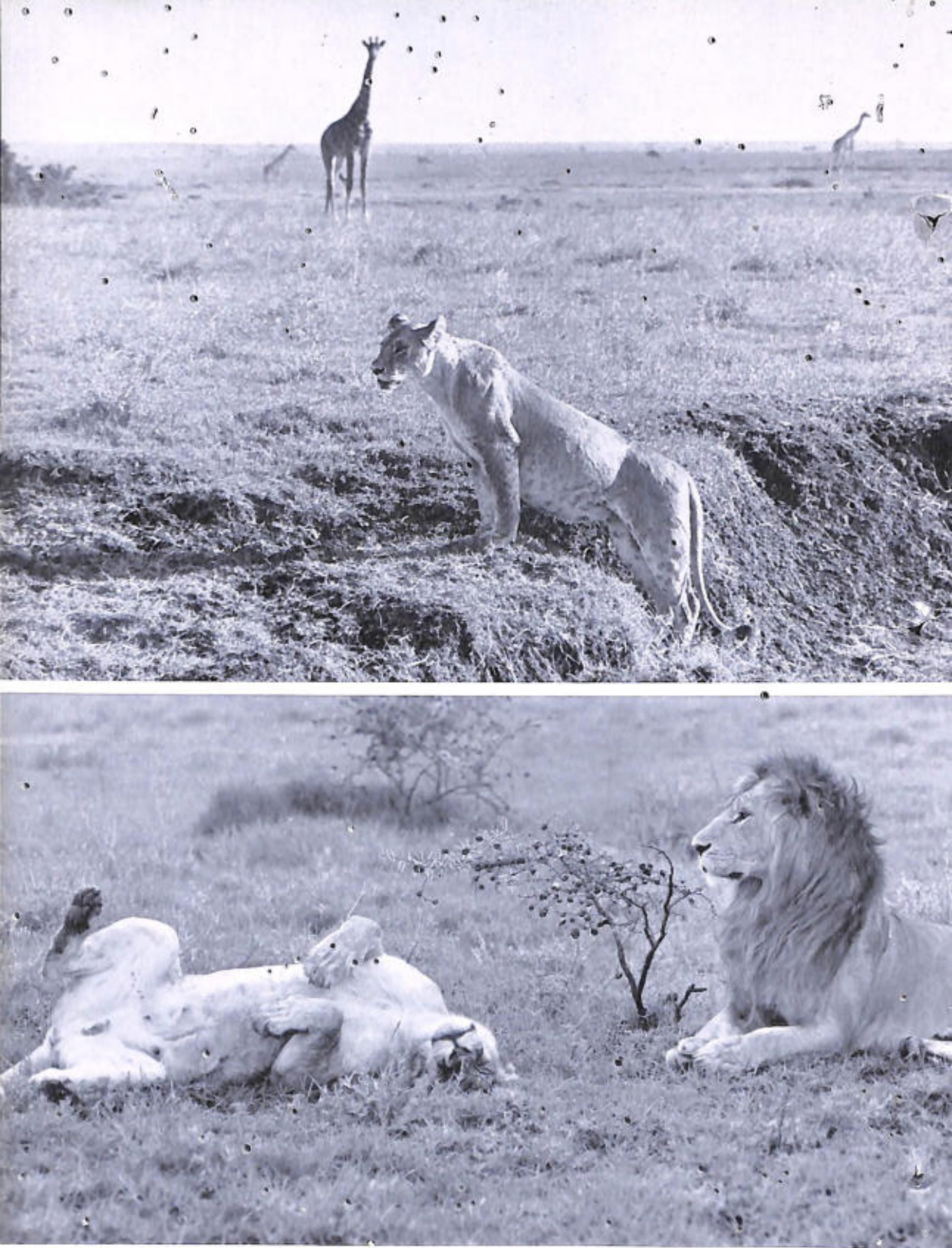


PLATE 30: *The Giraffe can easily spot enemies lurking in the grass*
BELOW: *Mating lions. "... the male usually just looks into space." Note the Whistling Thorn bush with its ant galls and two-inch thorns*

PLATE 31: *The Leopard*

PLATE 32: *The Cheetah has a regal look about it*
BELOW: *The Cheetah is long and thin, with a deep chest, long legs and a small head*

state. Like the Hyaena they do not deal a killing blow, but eat their prey alive. They have also been observed, after a preliminary tiring of the prey, to drive it past an animal lying in wait, which then springs out on to it.

A critic of the theory of concealing coloration once wrote that such coloration could play no part in the life of the Hunting Dog. To-day this is partly true as its mode of life does not require it to be camouflaged. But its present method of hunting has undoubtedly had to be learned as these animals probably once hunted alone. The colour, irregular dirty black with yellowish and white splotches, provides an excellent camouflage when in the shade of trees or bushes and may have been of inestimable value in the animal's past history, when perhaps it once lay in wait for its prey in such places, a technique that (as I have said) it adopts in a modified form to-day. Discussions on form and function in present-day animals too often omit all reference to the conditions of past existence under which they evolved and which have obviously determined their present form.

When the big cats have finished their meal, particularly with the Lion, then it is the turn of the other carnivores to eat. These others comprise the large gathering of Jackals and Hyaenas which follow in the train of a hunting animal, as well as the Vultures and a sprinkling of grotesque-looking Marabou Storks. Not a scrap of meat is wasted, for even when the scavengers have finished the bones are polished clean by ants and other insects. But owing to the rapid drying by the sun, blow-fly maggots, so common in northern climes, play little part.

Even the keratin covering the horns does not go to waste, for this is devoured by the larvae of a little moth called TINEA DEPERDELLA (Pl. 36), which looks very much like the

clothes moth to which it is closely related. This moth, buff coloured with darker underwings, lays its eggs on the fresh horn. These hatch into white, maggot-like caterpillars which bore their way into the keratin and feed upon it. When mature they build little protuberances on the outside of the horn in which they pupate, eventually emerging as the adult moth. Like the diet of the clothes moth, the keratin has little water in it and the larvae probably have to mature rapidly before it dries out too much. In a pair of Wildebeest horns that had been left on a thatched roof I found that most of the caterpillars' protuberances were on the damp side against the thatch with few on the dry side in the sun's rays.

When all these diverse agencies have been to work there is soon nothing left of the original dead animal except for the bleached dry bones, and even these will eventually be weathered down to provide chemical nutriment for the soil; that is, those that are not crunched up by the Hyaena.

Few writers have had anything complimentary to say about the scavengers and least of all about the HYAENA. Yet it plays a vital and necessary role in keeping the African countryside clean.

The most common is the Spotted Hyaena, *Crocuta crocuta* (Pl. 34), which, although usually covered with dirt, with its rounded teddy-bear-like ears is a not unattractive creature at times, although I doubt whether few people will agree with me.

Contrary to popular belief it will not hesitate to attack live animals when hungry and not infrequently succeeds in killing them. It is not able to kill an animal of any size outright and, having dragged one down, eats it alive. I have witnessed a fully-grown Wildebeest treated in this manner. When I first came

across it it had an injured foreleg, possibly torn open by a Hyaena running in and snapping at it. At this time two Hyaenas were harassing it, but it was still quite agile and succeeded in keeping them at a distance. A nearby herd of Wildebeest just stood by and watched the attack taking place without making any attempt to aid their fellow by chasing away the tormentors, as they could easily have done. Eventually the injured Wildebeest seemed to realise the futility of trying to escape and gave in, whilst the Hyaenas, whose numbers had by this time increased, rushed in and started to tear flesh from it. The animal was brought to its knees and though it moaned and bellowed softly it made no further attempt to drive the Hyaenas away.

There are many fanciful tales about the ability of the Hyaena to change its sex and, although this has been contradicted by various experts since at least 1877, the assertion crops up with unfailing regularity. This is owing to the fact that the rudimentary male organs, present in the females of all mammals, are very pronounced in the Spotted Hyaena. It is also not unlikely that captive female Hyaenas will try to associate with one another, in the same manner as domestic dogs do, as they come on heat throughout the year. Although often made out to be cowardly animals they will sometimes try to steal one of the larger carnivores' meals, and are not infrequently killed by Lions when doing so.

The Hyaenas' sense of smell must be one of the keenest amongst mammals, for it does not take them long to smell out carrion on the plains. All the time that it is walking about the Hyaena may be seen with its nose in the air, perpetually sniffing. They are said to arrive at carrion by sighting Vultures at a distance, but it may well be that they travel largely by scent. They always look filthy because of their habit of lying almost

PLATE 34: "*As soon as a Hunting Dog appears on the scene all the animals in sight begin to scatter*"

The Spotted Hyaena

around it in ever decreasing circles, getting closer and closer, extending its nose and sniffing curiously at the Cheetah which completely ignored it. What was this for? Was it to see whether the Cheetah's immobility meant that it was dead and it could take its kill which lay nearby? Whatever the reason it went off and took the kill, while the Cheetah got up and ran off at my arrival.

Side by side with Hyaenas and Jackals at a kill will be found the VULTURE (Pl. 35) of which there are a number of species. The only thing of beauty about the Vulture is the way it glides. Valuable as it is as a disposer of carrion, it is no pretty sight to watch it squabbling over a carcass; and with a beast like an Elephant numbers of them often get right inside and fight there! With their grotesque hooked beaks they tear away at the carcass until there is hardly any left for the ants, and if there is enough of it often stuff themselves so that they are hardly able to take off, and can only waddle away at one's arrival.

It has long been thought that the remarkable manner in which Vultures find carrion is due to their acute eyesight. Wheeling and gliding high in the air, almost out of sight of the human eye, they plunge down unerringly on an animal almost before it is dead. But the fact that scent may also play a part in detection must not be entirely omitted: for although most books insist that birds have no sense of smell, most examinations have been carried out on birds to which such a sense would be of no advantage. It was realised not so long ago that the immense height which Vultures reach was due not to strength in flight but to the fact that they soared upwards on thermal currents in the same manner that a glider does. These hot air currents are frequent in high temperatures and, rising from the ground, are likely to carry

scents up to a great height where the Vultures can detect them, for they seem to congregate in the air over a carcass, not all descending at once but indulging in a constant up and down traffic.

As anyone in the bush knows the best way to find Lions is to look for Vultures in the air. But the spotting of a wheeling flock of these birds does not always lead one to a kill as I have discovered more than once. Often it is nothing more than a roosting place, which is either in a group of trees or may be on the ground in an open plain. Nesting is carried out communally in cliffs, the birds returning to the same place year after year, the nests being placed in pretty inaccessible positions. With an animal that has died and has not been killed by a predator they often peck out the eyes first as this is the softest part for them to attack. In the case of thick-skinned animals like the Hippo and Elephant the rest of the feast necessitates a long and patient wait until the carcass bursts, a procedure that may take anything up to three weeks.

Although the more evil-looking, the Vulture is certainly not as grotesque-looking as another carrion feeder, the MARABOU STORK, *Leptoptiles crumeniferus* (Pl. 36). These do not rely solely upon carrion for food and will hunt frogs, insects, young Crocodiles and the like. A favourite food is fish and large numbers of them inhabit native fishing villages, serving an extremely valuable purpose as corporation refuse collectors, for such villages would be pretty nauseating places without them!

Anything from two upwards are invariably present at a carrion feast where they strut about seizing the odd piece from amongst the squabbling Vultures and stuffing it into their large

and ugly-looking red crop. I once saw one greedy individual with the leg of a stork, of a different species, which was so big that several inches including the foot was sticking out of its mouth. But the Marabou made no attempt to rid itself of what must have been a rather meatless dish to say the least of it, and during the hour or so that I watched it it kept vainly trying to get the whole lot into its crop. Such greedy individuals often end up by killing themselves.

CHAPTER FOUR

ANIMALS OF THE FOREST

Elephant—Rhinoceros—Buffalo—
Gorilla, etc.

ANIMALS OF THE FOREST

When we come to consider the larger animals such as the Elephant, Rhinoceros and Buffalo, it is not so easy to be precise about their habitat. It is only by their versatility, a capacity to exist in many habitats, that such large animals are able to survive successfully. The fact is that these animals may be found in either plain, bush or forest; but they are very much at home in the latter and in this respect they differ from most of the animals described under plain and bush, which would be at a distinct disadvantage in a forest environment. I have mentioned meeting Grevy's Zebra in the forest on Marsabit Mountain, and I have also met Reticulated Giraffe there, but both animals were trekking to water and were an exception.

These large animals are therefore best regarded as of the forest, which was undoubtedly their original habitat as with most other animals. If we believe that a form of tropical rain forest once stretched from coast to coast, as the evidence indicates, then there were either very few animals of the plains or else they were mostly forest dwellers.

To-day in areas like the densely forested Aberdare Mountains of Kenya, which are surrounded by cultivation, the Elephant is strictly a forest inhabitant, only emerging into the open at night. This is also true of the Buffalo and Rhino. Yet in many other areas the latter two animals spend a great deal of time out in the open during the day, while in the north of Kenya the Elephant

may trek for miles in semi-desert conditions, far from the nearest forest.

If asked which was my favourite African animal I would say without hesitation the ELEPHANT, *Loxodonta africana* (Pl. 37-44), the largest living terrestrial mammal. There is something both fascinating and exciting in watching these great beasts at home in the wilds, and the watcher is more likely to see Elephants play or show affection towards each other than any other animal.

Not the least interesting is their fossil history and the fact that to-day we do not know where the African Elephant came from. The earliest remains are found in Upper Egypt and date back to the Late Eocene period some 60 million years ago. These were of a small animal which probably looked something like a Tapir and was known as *Moeritherium*. The second upper incisor teeth, which form the tusks of the modern Elephant, were already much enlarged. This little animal was later followed by a number of other forms, notably the forerunners of the Mastodons, but the greatest wave of expansion took place in the Miocene era when animals migrated from their African origins as far as North America. One of the outstanding African forms was the Deinothere which is abundant in East African fossil deposits. This differed from the normal type in that there was a complete absence of enlarged upper incisors, but a well-developed pair of lower ones which curved sharply downwards and backwards.

Recent excavations in East Africa have revealed a gigantic form in which the lower tusks were five feet in length. Previously the largest form came from Europe, but this only had tusks of a couple of feet. The main evolutionary trend was represented by the Mastodons, which invariably had a lower as well as an upper pair of tusks. Characteristic of these was one known as *Trilo-*

PLATE 35: *A Griffon Vulture* Pseudogyps africanus

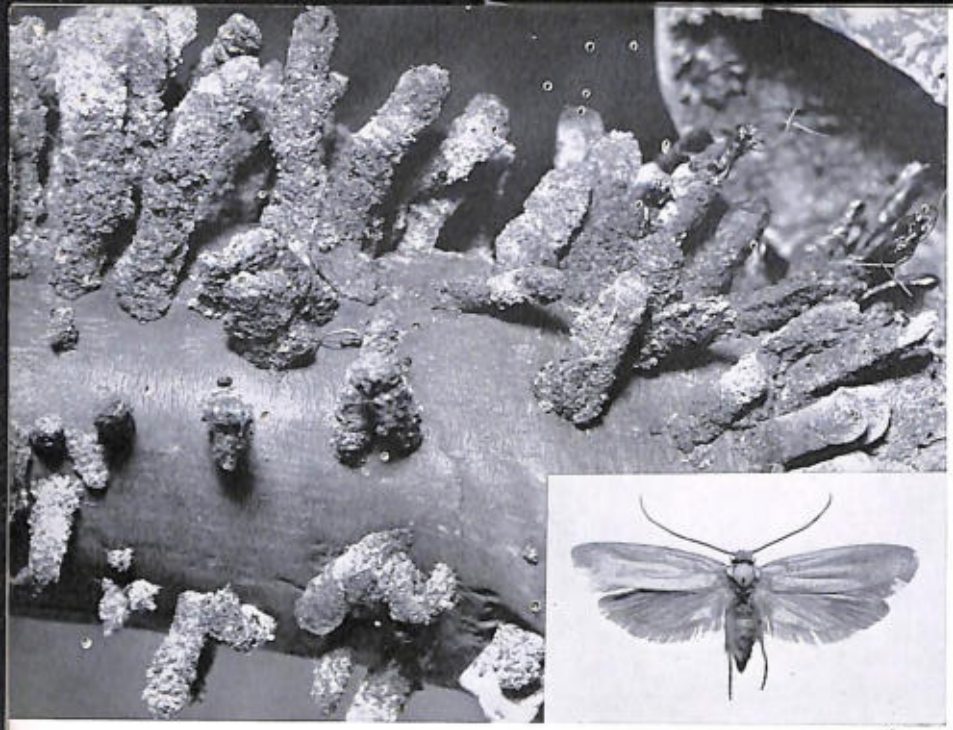


PLATE 56:
Miniature scavengers. Protuberances on a horn in which the caterpillars of the moth Tinea deperdella *(inset) pupate*

A Marabou Stork and a Vulture waiting for the carcase of a dead Hippo to burst

phodon familiar in East Africa at this time. Its lower jaw was considerably elongated with short, broad, shovel-like tusks on the end. The upper jaw was also elongated and bore a pair of slender, slightly-curved tusks. It was smaller than the modern Elephant but showed a gradual increase in size up till its ultimate extinction. With these animals the ivory of the tusk takes on its characteristic "engine-turned" appearance by which true Elephant ivory can always be recognised, as this trait occurs in no other animal ivory, such as Hippo for instance.

It is in the Lower Pleistocene that the first true Elephants appear in African fossil deposits, and the most characteristic one which survived until the Upper Pleistocene was the Straight-tusked Elephant, *Palaeoloxodon*, the largest and most advanced of all Elephants, not excluding the modern ones. Some species reached a height of fourteen feet at the shoulder, whereas twelve feet would be exceptional for an Elephant to-day. A tusk of this Elephant, recovered from Olduvai Gorge in the Serengeti, measures eleven feet on the curve, although this is beaten by the *record* tusks for the modern species, which measure eleven feet and eleven feet five inches on the curve. The Upper Pleistocene saw the disappearance of this Elephant and, although it falls into the same group as the modern African Elephant, it did not give rise to it; indeed, it was more advanced in many features than the latter, and why it disappeared in favour of a more primitive form is a mystery.

Because of its great size and ancient appearance there have been many fanciful tales about the age to which Elephants live, but responsible opinion places this at some sixty years at most. Like all naturally living mammals its age is determined by the persistence of its teeth; once they are all worn out and it can no longer chew its food it dies. Its teeth are highly specialised in that

each side of each jaw bone can only accommodate one tooth at a time: that is four altogether, one upper and one lower on each side. The pre-molars are shed early in life and then the three molars grow forward one at a time, pushing out the previous tooth when it is worn out. When the last molar is worn away, then no more come forward and, if the Elephant lives to this age, it usually seeks soft water vegetation. Hence aged Elephants often die in the water, and this is probably what has led to the stories of Elephants' "graveyards" as their bones are seldom found on land.

To keep its vast bulk going the Elephant requires a great quantity of food and so it is constantly wandering in search of it, feeding for some eighteen hours a day. It owes its success to its trunk, which acts as a most efficient food collector. One moment its owner is snatching a bunch of grass from the ground and the next it is reaching up to sample the leaves of a tree. It is fascinating to watch the rippling muscled trunk in action. The Elephant does not need to look at what it is eating; it smells it out with its trunk and, having selected what it wants with its very sensitive tip, curls the end around it and tears it off. If it is a bunch of grass it shakes off the soil from the roots, or perhaps beats it against the ground or against a tusk, then it curls its trunk under and pops it into its mouth. When dealing with a tough branch it uses its tusks as a support for the trunk and these are also used as "hands" in its food gathering. Strangely enough, it is "right-handed" in the use of its tusks—the right one is so much more often used for digging that it is almost always noticeably lighter than the left one. It is also the tusk which is more often broken, a not uncommon sight presumably caused by the Elephant being unaware of its own strength. Originally probably evolved as

weapons of offence, it now uses its tusks for the practical purposes of digging for water and roots, and breaking branches, rather than for fighting.

It has been said that an Elephant without its trunk would be absolutely helpless, unable to eat or drink, for it drinks by drawing water up through it, although when young and suckling at its mother's breast is uses its mouth like any other animal (P. 40-41). But although it is seriously handicapped without a trunk it can still manage to exist for some time as has been shown by those Elephants that have lost their trunks, or the greater part of them, in poachers' snares. Such an Elephant has been observed eating grass on its knees, and of course it could drink in the same manner or wade into the water; but it can only survive where there is a plentiful food supply.

Someone told me that he once saw two young Elephants squirting a Rhino with water through their trunks, much to the latter's discomfort, but I would not like to vouch for the truth of this although I would not put it past an Elephant to do so. I know that the African Elephant in the London Zoo will express its disgust by blowing in your face with its trunk if you don't feed it when it is proffered; but it has not yet got to the stage of squirting people!

Occasionally various departures from the normal tusk shape are found such as spirals, ones growing straight down like those of a Deinothere, or multiple ones, as many as six or more small tusks growing out of one socket together. In no case have these strange aberrations been found to be any sort of genetic throw-back to a primitive form, but always due to injury of the socket or growing tusk invariably caused by a clumsy hunter. The finest recorded example of a spiral tusk, first described in 1681, probably represents the earliest pathological specimen in any

museum in England. It is now in the collection of the Royal College of Surgeons.

To accommodate the weight of its tusks and also to provide attachment for the great muscles of the trunk and neck, the Elephant has a very large skull of which only a small part is occupied by the brain. Above and around the brain cavity lies a large dome of sponge-like bone, full of interconnected air spaces which serve to lighten its load. This dome is also present in Elephants with quite small tusks or even with no tusks at all. The size to which an Elephant's tusks will grow seems to be largely due to inheritance, and it is a definite fact that Elephants in East Africa to-day bear smaller tusks on the whole than they did fifty years ago, owing to the persistent shooting of those with the largest ones. Their size also appears to bear some relation to the area which they inhabit.

Yet despite the intensive hunting of Elephants that has gone on over the last fifty years owing to "control," and man's insatiable desire for billiard balls and ivory curios, it is firmly asserted in many quarters that Elephants are on the increase in East Africa.

Elephants do not suffer from any significant predators and Darwin pointed out as long ago as 1859, in his *Origin of Species*, that if a pair of Elephants began to breed at the age of thirty years, and brought forth six young in their lifetime, living to a hundred years, then after a period of 740 to 750 years there would be nineteen million Elephants alive all descended from the first pair! Although a female Elephant does not live for much more than half this period; it starts calving at ten years old and carries on almost until death, the calving interval being about four years. Thus Darwin underestimated anyway, but it is obvious that Elephants are not increasing at this rate. In many cases their

PLATE 37: *The evening drink*

PLATE 3[illegible] *The Elephant does not mind the Piapi[illegible]c bird. There is one above its left eye and one [illegible]t its f[illegible]et*

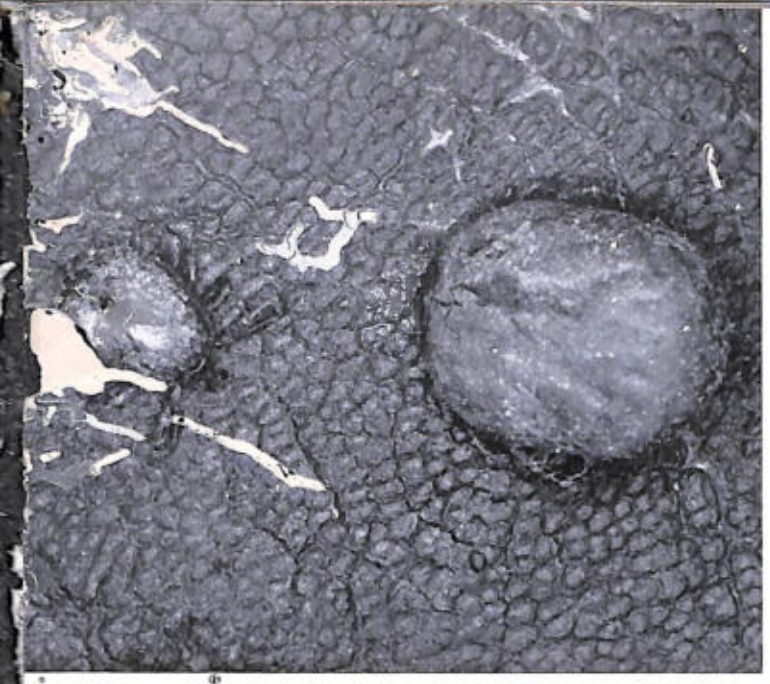


PLATE 39:
Close-up of a male and female Elephant tick Amblyomma *sp. on an Elephant's hide. The engorged female (right) is about* $\frac{1}{2}$ *inch long*

An Elephant trying to push a tree over

PLATE 40-41: *An Elephant Herd in the Euphorbia Country of western Uganda*

PLATE 42: *At the riverside*

PLATE 43: *"Then it sucks the dust up into the trunk and blows it out over itself."*

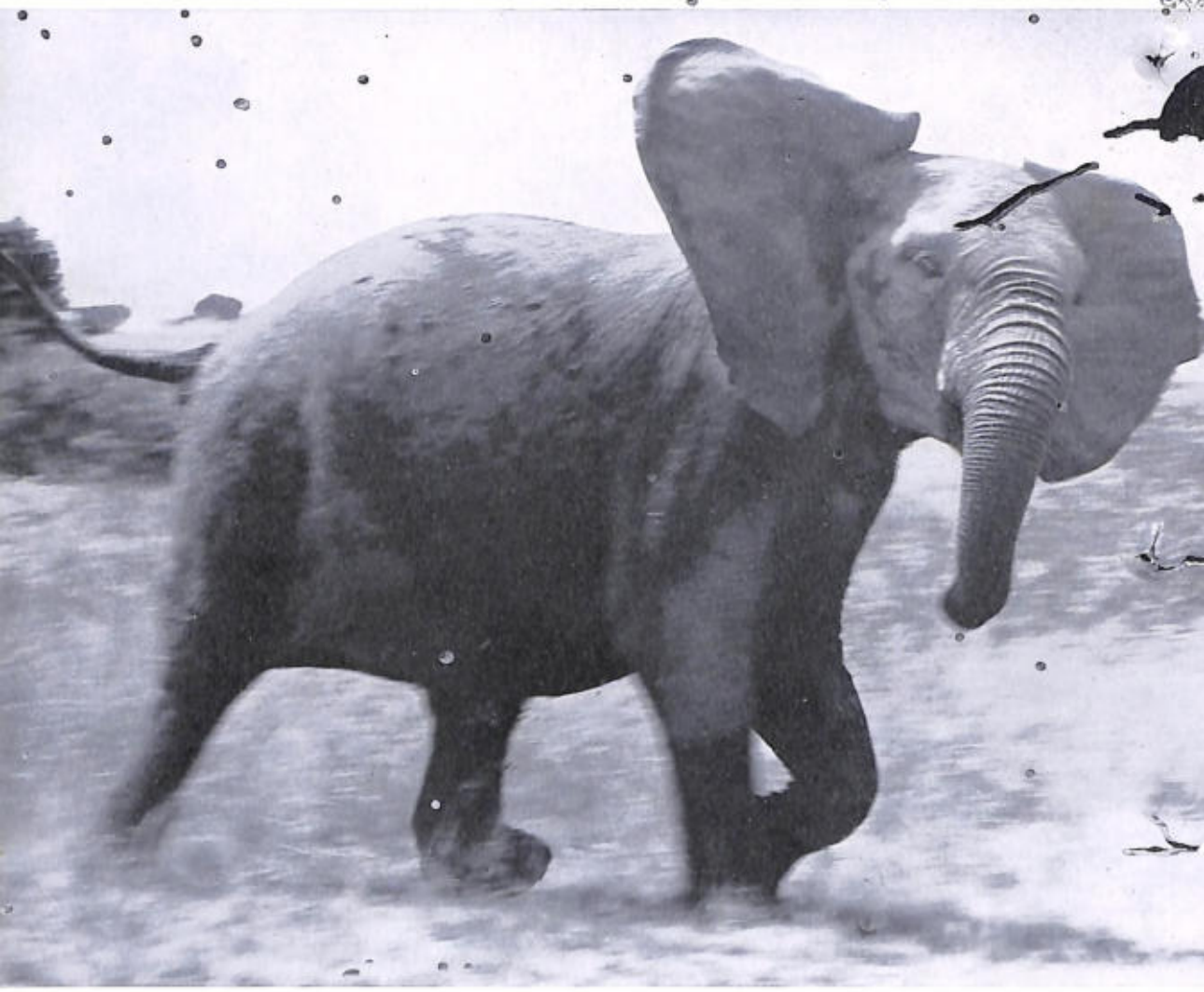


PLATE 44: *An old tuskless cow Elephant charging*

increase may be more apparent than real, because they are being restricted to smaller and smaller areas by advancing civilisation and often break out from these restrictions to colonise new areas. As to what actually prevents the Elephant from increasing at the rate calculated above one can only hazard a guess. I should say that it is drought, food shortage and infant mortality, in that order.

Does the Elephant destroy its own habitat? That is a question that is frequently posed, and after looking at a patch of bush that a herd of Elephants have worked over it certainly looks as if they do. But they seldom stay long enough in any one place to do irreparable damage and the African bush has wonderful powers of recovery when uninfluenced by man. The destruction of vegetation by trampling doesn't do any permanent harm because nothing is removed from the soil.

In the Amboseli National Reserve of Kenya, Elephants seem to be progressively knocking down all the attractive Yellow Fever thorn trees, which reach anything up to thirty or forty feet in height. They are probably only hastening the death of trees which would die anyhow because of changing soil conditions, for it is significant that none seem to be growing to replace the ones knocked down. Also, it should be realised that Elephants can only succeed in knocking down large trees that have already become weakened; else none would have a chance to grow up in the first place. As to how they knock a tree down, many writers assert that they butt it with the forehead; but I have my doubts. The only occasion when I witnessed an Elephant trying to knock one over it did it with the underside of its tusks (Pl. 39). It braced itself against the tree in this manner, it heaved and grunted with all of its might, but eventually with a big grunt and a violent expulsion of air it gave up the struggle and leant against

the tree in obvious exhaustion. Incidentally it chose a tree which was leaning over anyhow, but this may have been mere coincidence.

Amongst their many characteristics they are remarkable climbers, their ability belying their ungainly-looking size. In the Aberdare Mountains of Kenya I have followed their trails up valley sides which were so steep that I had to clamber up almost on all-fours. Under such circumstances they usually make huge steps in the earth with their feet and no doubt assist themselves along with their trunk. When they wish to descend a steep slope they merely sit on their haunches and slide down it! A friend once told me how, hearing a great commotion in the forest, he peered through some bushes and saw a whole herd sliding down into a river in this undignified manner.

Five digits are retained on all the feet, although the forefeet only possess three visible toes and the hind four. The great weight of the animal is borne on a pad of spongy tissue which the digits lie on top of, and owing to this pad the Elephant can move extremely silently. Its ability to disappear silently into the forest has often been remarked upon, and I once saw a good example myself. A herd of some twenty animals was browsing on a river bank about fifty yards away. The river at this point was very noisy and, although I called out quite loudly, they could not have heard much above the roar of the water. But suddenly there was not an Elephant to be seen. No noise, no fuss, no flapping of ears; they could neither see nor scent me, yet some unusual noise had intruded upon their reveries and with one accord they had just merged into the forest for safety's sake.

When an Elephant is on the alert the first thing that it invariably does is to erect its great sail-like ears; then it lifts its head up holding its tusks parallel with the ground. One frequently

sees pictures in books and magazines entitled "angry Elephant about to charge," when in fact all that it is doing is having a dust bath. Always look to see if the tusks are pointing down or if they are held up; if they are up then it is ready to charge, but if not it has no such intention. What follows after this preliminary assessment of the enemy varies. The Elephant may charge straight at it with the trunk hanging down, or curled up, or sticking straight out in front, or held up in the air. Or before charging it may first swing its head up sideways and eye you with one eye, always a very dangerous sign but not necessarily followed by a charge. Bull Elephants prefer to frighten one away with bluff if they possibly can, and often make a mock charge first, stopping after a few yards. Sometimes one will go through every trick in his book without charging and gradually back away all the time. One doing this in Uganda gave a demonstration which is rarely seen, possibly because few people wait to see what an Elephant in such a mood will do. After going through the ear-flapping, head-twisting and trumpeting stage, it knelt down on all-fours, lifted one foreleg into the air like a circus Elephant, and proceeded to paw the air, with its mouth held wide open and its trunk above its head!

Cow Elephants with calves go through no such preliminaries and will sometimes just charge straight out of a herd without any warning at all.

But Elephants are not normally aggressive animals and the tales of ferocity with which hunters' books are filled are caused by their treatment of the Elephants. In national parks, where they soon learn that man does not molest them, they can become very tolerant indeed—"tame" is a bad word to use and should never be applied to a wild animal that seems docile. The most famous instance is of a bull in the Murchison Falls Park of northern

Uganda which used to wander round the safari lodge there. Visitors found that if they left their cars near to it with a bunch of bananas on the front seat, they could get excellent photographs of it taking the bananas from the car. But Elephants are quick to learn and when it started finding cars without a bunch of bananas on the front seat it turned them over in annoyance. It soon became too bold to be safe and eventually the authorities regretfully had to shoot it. Many old bulls will allow one to approach within less than thirty feet in a motor car, provided it is done quietly and carefully, and will take no notice. But as soon as sudden movements are made they are at once on the lookout for trouble.

In spite of the large number of books about Elephants, essential information about their habits and physiology is still lacking. They are not easy animals to study; anybody who wants to keep a herd under close observation may well have to travel over thirty miles a day in the roughest of country to keep up with them. One puzzle that they provide is in a large gland situated between the eye and the ear which from time to time emits a sticky fluid that can be seen running down the side of the animal's face. This is often referred to as a gland of sexual significance which operates when the Elephant is in musth. This may be so in the Indian Elephant, with which parallels are usually drawn, but it certainly does not appear to be true of the African Elephant. Even if the gland is flowing freely there is no sign of excitement amongst the animals, and I have seen it quite active in Elephants that are far too young to breed. There is some indication that it might be more intense at the peak of the breeding season and it may well be that it was originally of sexual significance but has now lost this purpose. Most mammals possess a gland of this sort but its position varies greatly: on some it

Rhinos

occurs on the face, in others in the inguinal region, whilst in the Wart Hog it is on the underside of the feet, and in the Hyrax, in the centre of the back.

Elephants give birth throughout the year—hence animals of all sizes can be met with in a herd—but they have a peak period around December. They become very excited during this month and are much more difficult to approach without provoking a charge.

Although the Elephant carries its fair share of ticks (Pl. 39), mainly behind the ears and in the inguinal region, it is never attended by the Tick Bird or Oxpecker, a familiar bird on the hide of most of the larger mammals. For some reason the Elephant does not seem to like its attentions and, as it could be easily dislodged by a flick of the Elephant's trunk or by having a cloud of dust blown at it, perhaps it becomes discouraged. But in northern Uganda the place of the Tick Bird is taken by another bird called the Piapiac, *Ptilostomus afer*. This black-coloured member of the Starling family associates with all the larger animals and, strangely enough, the Elephant does not mind its attentions, allowing it to clamber freely over its face (Pl. 38). These birds are not specialised feeders like the Tick Birds; they are general insect-eaters and their main interest lies in the insects disturbed by the animals' feet as they move along. In this respect their habits are very like those of the little white Buff-backed Heron or Cattle Egret, *Bubulcus ibis*, which also attends the larger animals. Busily pacing along behind them it also eagerly seizes the insects that they disturb. They are wrongly called Tick birds—examinations of their stomach contents have never revealed more than an isolated tick or two. They can often be seen having a ride on the backs of Elephant, Rhino and Buffalo, but I have never seen them grooming their hides. From the difficulty that I have experienced in

trying to remove ticks from an Elephant's hide it is small wonder that they don't relish the attentions of Tick Birds.

It has often been said that the Elephant indulges in its mud and dust baths to alleviate the irritation of parasites on its skin. I, personally, can't see how this can be so. I have examined an Elephant that had been shot just after a mud bath. The ticks on it, although covered with mud, were still very much alive and kicking; and dust would have even less effect. The presence of mud could stop biting flies from reaching the skin, but I doubt whether dust would stop them.

When taking a mud bath the Elephant usually gets right into it as well as squirting itself, and others, with its trunk. With a dust bath it first selects a patch of suitably soft earth and then disturbs it with a swinging, scraping motion of one of its forefeet. Then it sucks it up into the trunk and blows it out over itself (Pl. 43). It may do this as an aid to merging with its surroundings, because the colour of an Elephant is always the same as that of the soil in the area: where the soil is red the Elephants are red, and where it is white the Elephants are white also. This can be very effective sometimes—one can easily mistake a solitary Elephant at a distance for a termite mound.

Until quite recently it was thought that the Elephant had a species of louse all of its own, apart from an almost identical one occurring on its Indian relative. But it has now been discovered in large numbers on a Wart Hog in Uganda; and whether the Wart Hog, which too has its own peculiar species of louse, has picked it up from the Elephant by way of mud wallows, or vice versa, is an interesting problem. Interesting, because lice are normally very choosey and do not readily switch from one animal to another, preferring to die rather than to feed upon a stranger. As the Elephant and the Wart Hog do not associate closely

together it is difficult to imagine how transference could have been effected other than via a mud wallow. That the parasite may have originally been the Wart Hog's and passed secondarily to the Elephant seems to be ruled out by the fact that it occurs on the Indian Elephant, and is also not normally found on the Wart Hog.

An animal the size of an Elephant can obviously accommodate quite a number of internal parasites. It seems to do so without any adverse effects, although none of them are any larger than those of other animals, and I think that tales of seasonal migrations to "Epsom salt" licks for the purpose of clearing out these parasites can be discounted. For one thing, if such salts were effective in clearing out intestinal parasites the veterinary surgeon's job in dealing with horses and cattle would be a lot easier than it is. All the large mammals seek salt licks and this seems to be merely to correct the sodium deficiency in much of the vegetation. We all know how necessary it is for us to eat plenty of salt in hot climates and it is just as necessary for animals.

Although many other elements or salts will accumulate in these licks in the same way as sodium, the latter is almost always present even in very small quantities, whereas the presence of other salts is variable. Thus I feel sure that their ingestion is merely coincidental.

An unpleasant disease to which the Elephant is particularly susceptible is Anthrax. Every so often an outbreak occurs to which numbers of Elephant succumb; but the disease is always confined, fortunately, to a restricted area and never spreads far. It is caused by a Bacterium and an extraordinary example of the persistence of the spores of this disease is provided by the case of a piano-key maker in America, who died suddenly after cutting up some tusks. It was subsequently discovered that they were

infected with Anthrax, the tusks undoubtedly having been collected from an animal that had died of it.

Nothing could look less like a Zebra, and yet the RHINOCEROS (Pl. 45-49) is undoubtedly more closely related to the horses and zebras than to any other animal. Few writers speak of it without referring to it as "primitive-looking"; and if the truth be known it is but little changed from its Miocene ancestors, although it is not as primitive as its foreign relative the Tapir. Its build is like that of many of the larger extinct animals in which the backbone is like a girder resting upon four pillars which are provided by the thick legs, each retaining three digits in the Rhinoceros to provide a splayed base. The same type of structure is also seen in the Elephant and Hippopotamus. Speed is not essential in animals of such large size which are able to look after themselves by sheer strength; but by reason of their length of body they can reach a speed of nearly thirty miles an hour if needs be, and this almost from a standing start.

The family tree of the Rhino is a rather complicated one consisting of many small branches all ending suddenly without a dominant trend, and at the moment the oldest true Rhinoceroses seem to be North American in origin. Like the Elephant the immediate ancestry of the East African ones is unknown; they do not seem to have derived from the Miocene fossil forms.

To-day there are two species in East Africa, the more common Black Rhinoceros, *Diceros bicornis* (Colour Pl. 3), and the rare White Rhinoceros, *Ceratotherium simum*, confined to a small area in Uganda, the Congo and the Sudan. Throughout the Lower and Middle Pleistocene the White Rhinoceros appears to have been common throughout the whole of Africa, whereas the Black Rhino was rare. This position was not reversed until the Upper

PLATE 45: *A Black Rhinoceros with its attendant Tick Birds*

PLATE 46-47: *Not really playing. Due to the disposition of its weight the Rhino always rolls over in this comical fashion when it flops down suddenly*

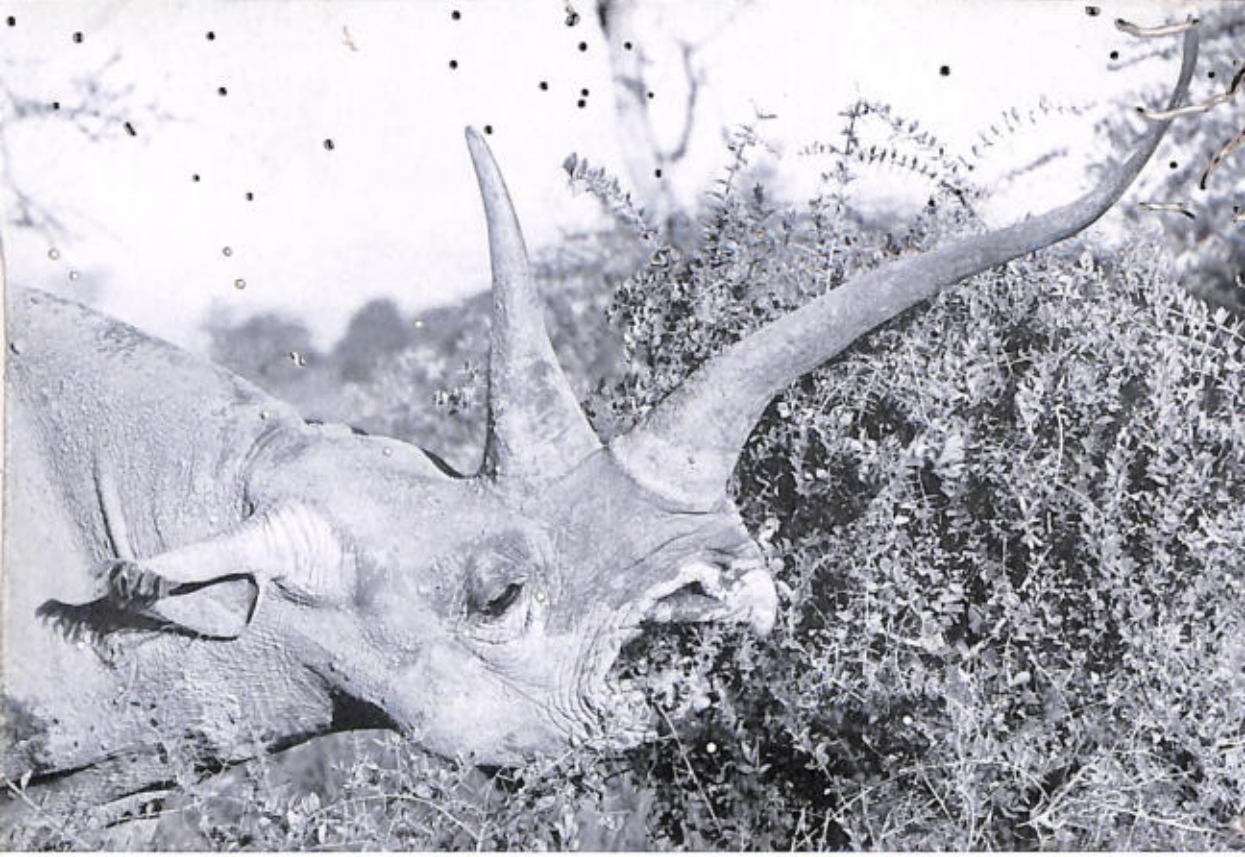
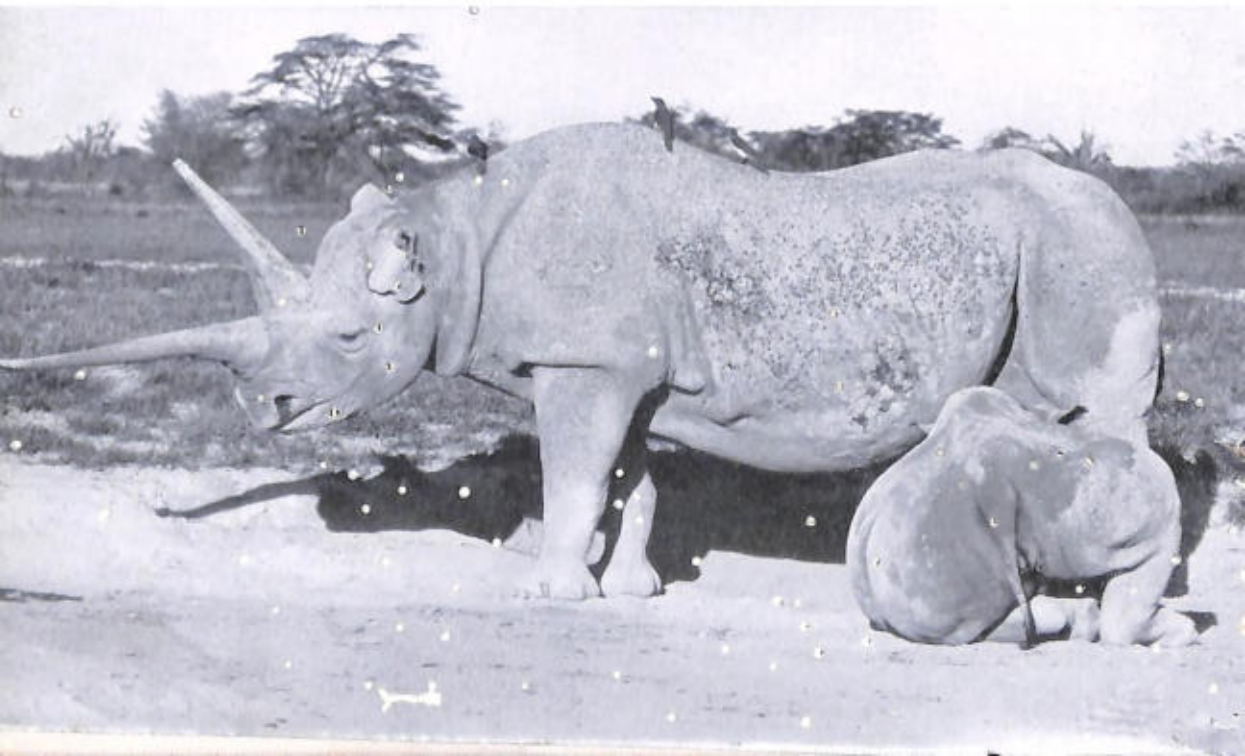


PLATE 48: *A close-up of Gertie and her remarkable horn. Note the prehensile lip and the fact that her nose is running!*

Gladys with her broken horns and torn left ear. The black dots on her flanks are Bot flies. The calf is far too big to obtain any milk, although it is trying to do so



Pleistocene and has remained reversed until to-day. The White Rhino is, next to the Elephant, the largest of terrestrial mammals, being nearly a foot higher at the shoulder than the Black. Despite its size it is a much more docile beast and rarely attacks. There is little difference in colour between the two but the White is easily distinguished by its square lips, unlike the pointed prehensile ones of the Black, for it is strictly a grazer.

On account of mysterious aphrodisiac properties attributed to the horn by certain Asiatic peoples, the Rhino has been sorely persecuted, so much so that it seems to be threatened with extinction. The horn is peculiar amongst mammals and has long excited the interest of naturalists. It is generally referred to as a mass of hair "cemented together," but I would prefer to describe it as a keratinous or horny material of a fibrous nature which (although more pedantic) would be nearer to the truth. Chemically it is essentially of the same constitution as the horns of other animals; but it lacks a bony central core and thus there is no fusion with the skull, just as the keratinous outer covering of an Antelope's horn does not fuse with it. There are normally two horns in the African Rhino, medially situated on the nasal bones, although in earlier literature records of three horns, the third being little more than a bump, were not uncommon. The persistent shooting of this animal by trophy hunters seems to have resulted in their rarity to-day.

Reference could not be made to Rhino horns without mentioning the remarkable specimens exhibited by "Gladys"[1] and "Gertie," two almost world-famous Black Rhinos that live in the Amboseli National Reserve. Both of these animals, apart from other remarkable attributes which will be described later, have possessed horns of outstanding length, probably living world

[1] Since this was written Gladys has been killed by poachers.

records. Normally the Rhino keeps its horns ground down to a fairly sharp point by goring the ground, and by rubbing it on termite mounds and trees. This habit is particularly noticeable in zoos where they rub them on brick walls and also between the bars, which causes them to become laterally flattened. The horn is fairly soft and, as it grows throughout the animal's life, rubbing it down is necessary to stop it from growing to uncontrollable lengths, when it would be useless for its primary object of fighting. "Gladys" and "Gertie," being exceptionally docile females, have not worried about this, it seems; hence the great lengths which their horns have reached.

At one time "Gladys" (Pl. 48) possessed the longest anterior horn by several inches, but broke off about eighteen inches of it in 1955. Unfortunately the piece was never found, so we shall never know exactly how long this great horn was. Until 1959 "Gertie" (Pl. 48) then reigned supreme until her horn too was lost in fighting. First of all the tip was broken off, snapping where it had worn thin on the underside from touching the ground; and then, probably in repulsing the attentions of a bull Rhino, the whole of the remainder of the anterior horn was torn off at the base, leaving it bleeding profusely. When I last saw it in early 1960 the wound had healed and it was already growing again. The regeneration of Rhino horns is of normal occurrence and has been observed in a zoo specimen; but it is doubtful whether this particular specimen will ever grow very large again as "Gertie" must be a pretty old animal by Rhino standards. One can't help thinking that the loss of it must have been quite a weight off her mind as she always used to carry her head very low when walking along, with the tip often scraping on the ground.

From a study of photographs taken in 1952 "Gertie's" horn

mast have then been about forty inches long. The major portion which was recently broken off was recovered and found to be thirty-nine and a half inches in length; this was matched against photographic enlargements of the intact horn in life and its total length was thus estimated at fifty-four and a quarter inches. So it would appear to have grown about eighteen inches in six to seven years.

During the last century some horns "of great length and slenderness, coupled with small size at the base" were obtained from traders at Zanzibar. They were thought by some to be those of a new species which was termed "Holmwood's Rhinoceros," although others quite rightly thought that they might be the abnormal horns of an ordinary female. There seems little doubt that they were similar to those found at Amboseli. The uselessness of such exaggerated horns as a weapon of offence was clearly shown by the breaking of those of "Gertie" and "Gladys." They would also be quite useless for another purpose to which the Rhino frequently puts it, and that is digging out salt. I have seen a complete cave in the Aberdare Mountains dug out by Rhinos; at the same spot was an archway with Bamboos growing on it made by these animals. A particularly large cave also exists on Marsabit Mountain. They are easily recognised as being the work of Rhinos because the roof is scored with indentations, like thousands of pickaxe marks, where the Rhinos have dug their horns into it.

From the earliest days of African hunting the hunters have always written about the ferocity and vindictiveness of their quarry—it would not do for a hunter to write about its gentleness! Thus it behoves the naturalist of to-day to vindicate the true nature of such animals. Sensational writers have always described the Rhino in the worst of terms as a bad-tempered and dangerous

beast. I would not contradict the latter, for its unpredictable nature makes it a dangerous opponent indeed. But if it thinks itself to be in danger it is just as likely to run off with its tail in the air as it is to attack.

Records of the domestic relationships of the Rhino have been clouded by such assertions of bad temper. Because of its "bad temper" it is quite often stated to be a solitary animal, a point which I regard as highly doubtful. In the Amboseli Reserve for instance, which must be one of the finest places in Africa for observing them at close quarters, I have seen groups of five; and up to seven have been reported associating together during the daytime. These are invariably females with young ones at foot, and young animals that have been driven off by their parent, who may still be in the same group. Most of the large males seem to keep to the undergrowth during the day, but this is not always the rule.

Such groups of animals when seen together never show any signs of hostility but, rather, as much affection as any group of animals, often greeting one another by rubbing noses. I have even seen one rub the underside of its chin on another's back, just as a cat will do. The females are particularly patient with their single offspring which accompanies them for two years or perhaps more, long after the parental milk supply has ceased. I have watched these young animals, with a sizeable horn on their nose, butting away into their mother's inguinal region in a vain attempt to obtain some milk (Pl. 48). The long-suffering parents made no attempt to drive them away, unlike many animals that seem to us to display an unnecessarily harsh attitude towards their suckling young. The calves make a mewing noise which sounds rather plaintive; it is seldom heard in the adult animals which usually only snort and grunt.

Impala buck

Defassa Waterbuck

In the morning when the sun comes up Rhinos normally seek the shelter of the bush and leave the open plains where they have spent the night sleeping and browsing. One morning I came across a female and her calf still out in the open; the calf wanted to go into the bush but the mother was quite content to stay where she was. The calf kept trotting off to about fifty yards' distance and would then stop and look back to see if mother was following. Seeing her still standing there it would then trot back again, mewing loudly, and rub its face affectionately against hers. This demonstration of calf love went on for some time but left the mother quite unimpressed. She just stood there and yawned!

From my experience it seems that a male may remain attached to a female after mating. In the Ngorongoro Crater, for example, a male and a female with a large calf were pointed out to me that had all three lived together there for some considerable time. At Amboseli once I came across a very aggressive male guarding a female, and returning to the same spot later in the day I found the female about fifty yards distant in some thick bush and the male still spoiling for a fight. To the casual onlooker this might appear to be two separate Rhinos; but I think that they were probably very much attached to one another.

In forest areas I should say that I have just as frequently put a pair to flight as I have a single individual. There is no doubt that these lone ones do occur just as they do with most other animals; but to describe the Rhino as a solitary animal is wrong.

An instinct for survival causes many animals either to flee or to attack first and to think afterwards. A good example was provided by two Rhinos which I was once watching out in the open, and which, in their turn, were watching me. So intent were they that they did not notice a third coming to join them until it was right amongst them. Suddenly aware of its presence, they

took fright and, swinging around, charged off snorting and blowing, while the new arrival slowly followed them in obvious bewilderment. On another occasion I was watching an old bull Elephant quietly browsing when another came walking up behind it. It did not hear the advent of the newcomer until it was right behind and then the old bull swung round, ears wide out and tusks at the ready for instant battle. It immediately relaxed again upon seeing that it was just another Elephant, and the newcomer extended the tip of its trunk in the typical manner of friendly greeting between Elephants. Of course had it been a potential enemy such as a motor car, the alarmed bull might have charged straight away.

"Gertie," of Amboseli, has the further distinction of having given birth to an "earless" calf; such congenital abnormalities or mutations do occasionally occur amongst animals, but the ones concerned do not usually survive for long. This one, however, born in 1953, was holding its own in 1960 when I last saw it. In this case it is only the external pinna of the ear that appears to be deficient. The pinna is thought by scientists to be mainly for discerning from which direction a sound is coming, and for reducing its intensity if too loud. A round hole on either side of the head, signifying the entrance to the auditory canal, is all that can be seen on this animal, which looks very odd compared with normal Rhinos with their large, trumpet-shaped ears (Pl. 49). This "earless" one appears very nervous when one approaches it in a motor car. I found it by itself one day in the open and although it orientated the sound correctly—it turned and looked at me—it did not seem to trust itself and ran off to join a pair of Rhinos, in whose company it did not seem to worry unduly. Such behaviour may not have had anything to do with its deformity, which is possibly not unusual amongst Rhinos—

another "earless" one was living in the Ngorongoro Crater at the same time.

Sir Samuel Baker, a famous African explorer who was also a keen naturalist, refers to the Rhino as fighting with its teeth amongst its own kind and biting off another's ears. Although such behaviour is common with an Indian Rhinoceros, and is the latter's primary method of attack, this is the only report that I have ever come across of such behaviour in the African species. It is not, however, to be lightly dismissed as "Gladys," the other Amboseli Rhino already mentioned, possesses a badly torn ear (Pl. 48). Possibly it was torn at the time that she broke her horn; in any case, it is difficult to see how it could have been torn otherwise than by fighting. The Indian Rhino never uses its horns to attack with; it has very sharp lower canine teeth which it uses, and which are rudimentary or absent altogether in the African animals. If you are thinking that perhaps "Gertie's" calf had its ears bitten off, then I must hasten to add that this abnormality was observed within a day or so of its birth.

A habit of the Black Rhino that has given rise to fanciful stories is that of breaking up its droppings. You hear that it is such a bad-tempered animal that it turns round and breaks them up in fury with its horn. I've never seen one do this. It is always done by a scraping, kicking movement of the hind legs, just as a dog will do. A Rhino often has several defecating places within its territory, but this is not a strict rule, neither does it always break up the droppings. In forest and thick bush country one can often find them intact, but in hot open country they are often reduced to a shapeless heap anyway in one or two hours by the rapid action of numerous dung beetles that invade them. I have watched females indulging in this habit with the calf at heel copying the parent. Various suggestions have been advanced to

explain the habit, but we may be attempting to write more purpose into an animal's behaviour than really exists. It seems highly likely that regular defecating places mark out the animal's territory although, as the associations of Rhinos at Amboseli show, this is not jealously guarded. If this is so the breaking-up may be merely to prevent the heap from becoming too high. Another suggestion is that it breaks them up so that other animals cannot easily tell what animal it was; this is the opposite of the other suggestion.

Yet another suggestion is that it may be an instinctive reaction to try and rid itself of a parasite known as the Bot fly, but I don't think that its actions are effective enough for this. If we knew why our domestic dog does it then we might be nearer to knowing why the Rhino does likewise.

The Bot fly infests not only the Rhinoceros but Horses and Zebras too (Pl. 7). The Rhino ones are perhaps the more interesting because of their large size and imitative appearance. The adult flies have a wing span of some two and a half inches and are coloured a dark blackish brown, including the wings, with reddish-brown legs. This colouring is interesting in that it mimics the African Pompilid Wasps which have a powerful and unpleasant sting Of course when the insects are set and pinned out side by side this resemblance may not look very close; but one must think of the living, moving insects to appreciate the mimicry. The Rhino Bots have no stinging or defence mechanism but even so it is difficult to attach any importance to the mimicry as there do not seem to be any potential predators of the Bot fly that might be deterred.

The adult flies can often be seen in great swarms on the back and flanks of the Rhino (Pl 48), flying up in a buzzing cloud when it rolls in the mud. As the Rhino never rolls right over on to its

spine there is always a dry patch left where the Bots immediately settle again. These flies are almost certainly mating and egg-laying; they do not feed in the adult state and therefore have nothing else to do before they die. Although our knowledge of their life histories is almost non-existent their occurrence is probably seasonal, explaining why one does not always see them on a Rhino. On the other hand, I have seen plenty on Rhinos in one area and, moving to another place some two hundred miles away, have been unable to spot a single specimen.

According to one authority the eggs are laid on the skin of the ears, neck and shoulders, having a little stalk that spreads at the base and holds the egg firmly in position. The next stage is unknown, but somehow the emergent larvae or maggots enter the stomach of the host. In the Horse this is said to occur from the animal licking itself, but this would be impossible for the Rhino because it can't bend its neck round that far; so presumably they bore their way through the skin. In an infected animal they always seem to occur in vast numbers, the stomach wall being absolutely covered with them. They attach themselves by means of hooks and remain in this position for an unknown length of time. They then detach themselves and are passed out in the host's droppings, being about an inch long at this stage. Their outer skin forms a hard case and they pupate within this on the ground, eventually emerging as the adult fly.

Despite the thickness of its hide a Rhino still has plenty of ticks and it is perhaps not surprising that they are the largest of all. When we speak of the thickness of a Rhino's skin, like the Elephant and Hippo, it is the layer underneath which is thick; the dry outer layer is little thicker than that of any other animal. The Rhino also has hairs over its body but they do not extend above the surface, except when it is very young. Its ticks are eagerly

sought after by the Tick Birds which are constant companions of the Rhino (Pl. 45). The fact that they warn it of the approach of enemies is well known but may be more of a coincidence than a knowing association between bird and beast. They are easily scared birds and, even on an animal like a cow, will still set up a chatter if a man comes near and hide on the far side of the animal.

Tick Birds, *Buphagus sp.*, are highly specialised members of the Starling family and obtain the whole of their food, mainly in the form of ticks, from the larger animals, undoubtedly doing them a service of incalculable value. They have a stout, blunt beak, with which they explore the hide in a rapid scissoring motion, and curved, sharply pointed claws with which they can safely cling to the hide of an animal without any danger of falling off. Probably flocks of them work over quite a large area; whether particular birds follow a particular animal is doubtful, as the supply of ticks would soon give out if they followed one host for long. They are often said to be carnivorous, for if an animal has a sore they rapidly enlarge it; but there is nothing to show that they start such a sore in the first place. Once a wound has been opened up they keep the surface clean and free of maggots or other infection but do not allow it to heal. Animals with sores never seem to show any resentment towards the birds' attentions. Popular opinion has long held the Tick Bird to be responsible for what appear to be suppurating wounds behind the shoulder of the Rhino. If a Rhino has been wallowing in dust or mud, as is often the case, these wounds are not visible; and this is, doubtless one reason why they are so often overlooked. One authority states that they are glands, which one might suspect from their frequency in the same position, and another that they are the result of infection by a small parasitic worm. In neither case is the Tick Bird responsible.

Another of many inaccurate stories about the Rhino concerns its liking for thorns. How often does the cinema screen, for example, picture one having its dinner off a thorn bush, and then move in to a close-up of the two-inch thorns? I have examined some of these thorn bushes immediately after a Rhino has left them and found that they only select the choice soft end-pieces. No doubt they might eat the tougher parts if they were hard pressed, but it is not the general rule. Although primarily a browser, using its pointed upper lip to select and tuck food into its mouth (Pl. 1), the Rhino will also feed off the ground and does not seem very particular about what it eats, garden flowers even finding their way into its mouth! I once published a close-up photograph of a Rhino in the act of tucking some food into its mouth with its upper lip. From the letters and comments that I received it was apparent that few people had ever actually seen this. Because its lip wasn't sticking out they thought that it had been shot away.

The Rhinoceros is without any doubt a strange and fascinating creature. But with its horn fetching the present high price the prospects of its continued survival in the face of the poachers' onslaught are not very bright. The cause of its extermination is ridiculous—the people who seek it as an aphrodisiac could get the same concoction by grinding up their own toenails!

The BUFFALO, *Syncerus caffer* (Pl. 49-52), offers a challenge to the hunter purely as a trophy, and is not eagerly sought after by poachers who like to keep out of its way. Its interest lies mainly in the reputation that it has earned as the most dangerous of all African animals, more hunters having lost their life to this animal than to any other. The reason usually given for this is that the Buffalo, if wounded, circles round and attacks its pursuer from

the rear. But this is not the only factor that ranks it as the most formidable of all the ruminant herbivores. It not only has the advantage of being immensely strong and well armed, the horns meeting in a great impenetrable boss over its forehead, but its senses are unusually acute. It can see well, hear well and smell well; and the combination of all these qualities has made it a fearless adversary. But it should not be imagined from all this that the Buffalo is an aggressive and offensive animal. In fact, when one sees them grazing they look just like a herd of country cows, and are just as inquisitive. But taken unawares, a solitary bull (Pl. 50-51)—and there seem to be large numbers of these—will frequently attack a man on foot. Their behaviour varies from area to area according to the amount of persecution that they have suffered.

In western Uganda, for instance, they spend the day grazing and sleeping out in the open just like cows (Pl. 52). But in most other places they are strictly forest animals, only emerging on to the plains when it is dark and leaving for the forest again as soon as it is light. Some of the herds that they move about in number many hundreds of animals; yet they leave very little evidence of this in the forest, often following age-old paths into its depths.

The farmer hates the Buffalo, but his feelings are based on superstition rather than fact. He fears it as a carrier of disease. The Buffalo seems particularly susceptible to Rinderpest, which swept the length and breadth of Africa at the beginning of the century and exacted a fantastic toll in cattle and wild game. When the disease breaks out Buffalo always trek away from the area of infection, splitting up into the forest. Although it may well spread the infection farther by this method, it also limits it by avoiding contact with other animals. Travellers through East

Africa at the time of the plague stated that the Buffalo was practically extinct and that the area was finished as far as hunting was concerned. Yet the Buffalo had practically regained its former numbers within thirty years, and to-day is as plentiful as ever.

The Buffalo has only one notable predator, the Lion, and I doubt whether the Lion takes many. Owing to its rapid breeding ability and the heavy weight that it attains one would have thought that it would have been worth while trying to domesticate it, especially as you would then have an animal resistant to many of the diseases that cattle succumb to. Perhaps it is the potential ferocity of the beast that has put people off in the past. Recent experiments in carcass analysis have shown that it would be a much more efficient utiliser of vegetation than domestic cattle. Buffaloes that have been kept for experimental purposes seem docile enough and solitary individuals from time to time have been known to join a farmer's herd of cows and live with them. So domestication should not prove to be too difficult.

Where the great tropical rain forest of the Congo merges with the open plains in western Uganda some of the Buffalo herds are of all shapes and sizes. In colour they range from black to light brown, the latter often with black at the extremities such as the ears, muzzle and legs. Their size is generally smaller and lighter than the Buffalo of farther east, and the horns also tend to be small with much variation in shape (Pl. 49). These are popularly supposed to be crosses between the big black Buffalo of the eastern plains and the little red Forest Buffalo of the Congo; but it is more probable that they are not simple hybrids but represent a transitional stage from the Forest Buffalo to the other one. The same thing can be seen with Elephants in this area: where there are herds with a considerable variation in size of body

as well as of tusk development, these also are more likely to be transitional forms from the Forest Elephant rather than crosses. For one thing, the normal habitats of the two distinct forms do not overlap.

Owing to its cow-like qualities there is little strange or unusual about the Buffalo on the surface, although careful observation would perhaps reveal many surprising facts about its life. Until fairly recently it was thought to be descended from the Asiatic type, and then the discovery of an extremely well-preserved skull in the Sudan showed that its origin was unique, occurring possibly in Africa itself.

Yet another giant of the forest is the Mountain GORILLA, *Gorilla gorilla beringei*, restricted in East Africa to a few small areas in the extreme west of Uganda. We know nothing of its relationships with the other animals except that it is preyed upon successfully by the Leopard. On the whole, Gorillas seem to be very easy-going beasts, only roused to wrath when they are cornered and normally, like all wild animals, preferring to keep well out of the way of possible trouble. For this reason they are rarely seen although they can be tracked down. But the most that the forest wanderer is likely to see is their tracks, the almost human footprints and the impressions of their knuckles made as they move along on all-fours. Here and there along the track are pieces of wild celery that they have spat out or a frayed piece of bamboo that one has been chewing. Often found too are the rough nests in the undergrowth, made of a few leafy branches pulled together, where they spend the night. A new nest is made each night as they always keep on the move.

As restricted in its localities in East Africa as the Gorilla is the Chimpanzee, *Pan troglodytes*, a creature even more difficult to

spot—usually the only indication that one has of its presence in the forest are its loud cries. Monkeys are perhaps the most characteristic animals of this habitat, but most of them require a great deal of skill and patience to observe successfully; they are very wary animals and will have seen and heard you long before you are anywhere near. This is not so with the commoner species such as the shaggy old Sykes's, *Cercopithecus mitis*, with his little white beard, that sits high up on a branch watching you until the last minute, giving hoarse warning barks to the rest of the troop as it moves away. In suitable localities the Black-and-white Colobus, *Colobus abyssinicus*, is also common. It uses its beautiful long coat as a parachute and can often be seen making prodigious glides from branch to branch over a river valley.

Owing to the denseness of the forest habitat almost all its inhabitants are hard to see; and this is just as true of the large ones that have been discussed here as it is for such animals as the Bongo, Forest Hog, Bushbuck, Duikers and Suni. The elusiveness of the Bongo, *Boocercus euryceros*, is almost legendary. It hides away in the undergrowth and sits listening for the slightest sound with its large ears. It is up and off long before you are near, but its tracks show that it is not uncommon in some areas. So is the Forest Hog, *Hylochoerus meinertzhageni*, which is more likely to be heard than seen. It just blunders away head first without any craft, but before one has a chance to see it.

The Bushbuck, *Tragelaphus scriptus*, being quite common, is more often to be seen either dashing through the undergrowth or coming out of the forest fringe singly or in pairs in the evening to graze. The charming Duikers, *Cephalophus* and *Guevi sp.*, only a foot or so high, also often leave it until the last moment to dash away. But to see the Suni, *Nesotragus sp.*, the smallest of all, one's best bet is to sit in the forest and hope. Its tracks can be found in

soft earth looking not much bigger than holes made with a pencil, and not far away there will be little piles of its droppings, as it has regular defecating spots, especially at the edges of forest patches.

I once possessed a pet Duiker and this animal used to scrape out a careful hole with its forelegs before urinating and defecating. It would then carefully cover it over. I know of no other Bovid that does this and it was certainly not due to my tuition. But I had it perfectly house-trained within a couple of weeks, because it always gave me good warning of its intentions by trying to dig up the floorboards!

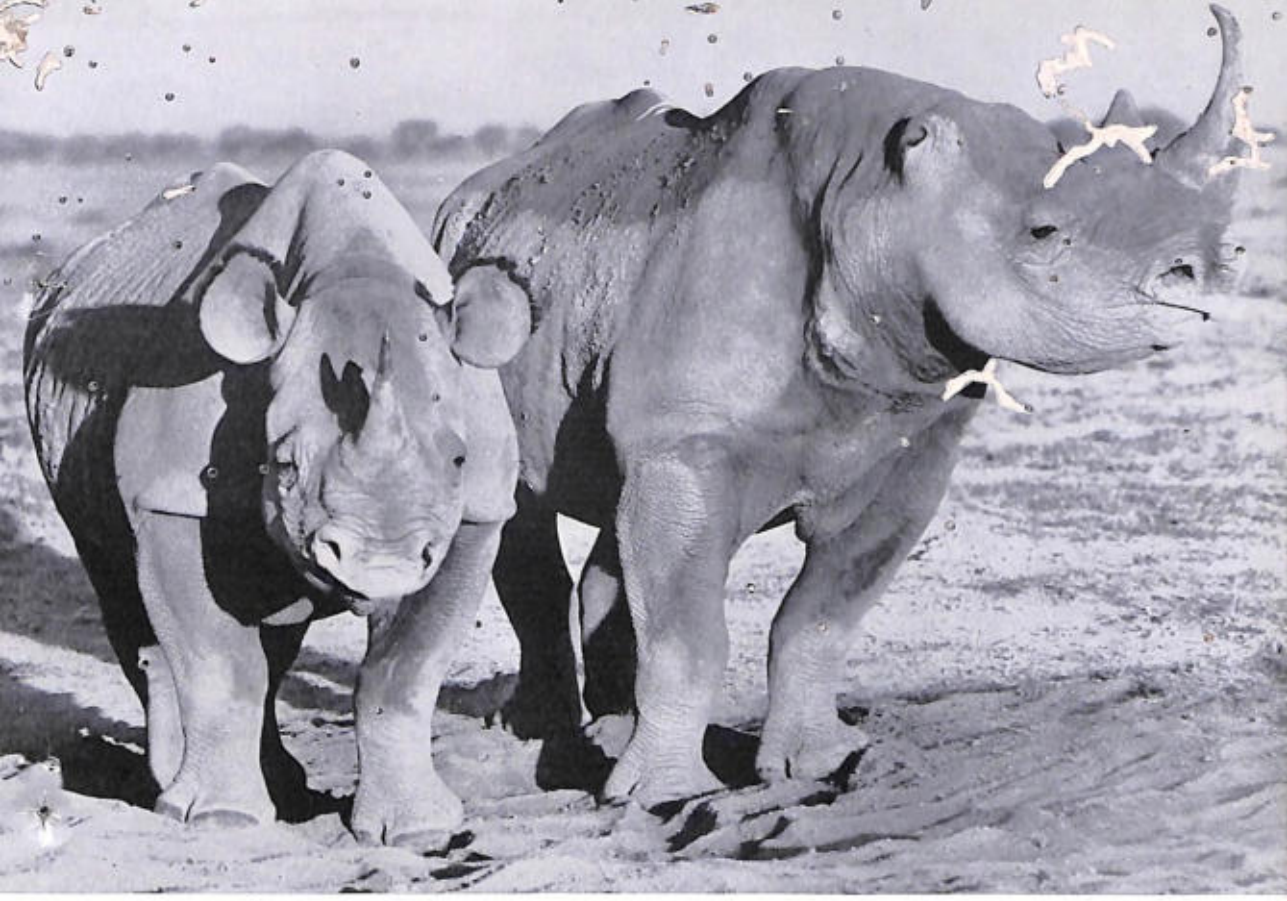


PLATE 49: *Gertie's "earless" calf (right)*
BELOW: *Buffaloes in western Uganda showing a light brown one in the centre*

PLATE 50-51: *A bull Buffalo emerging from a mud wallow*

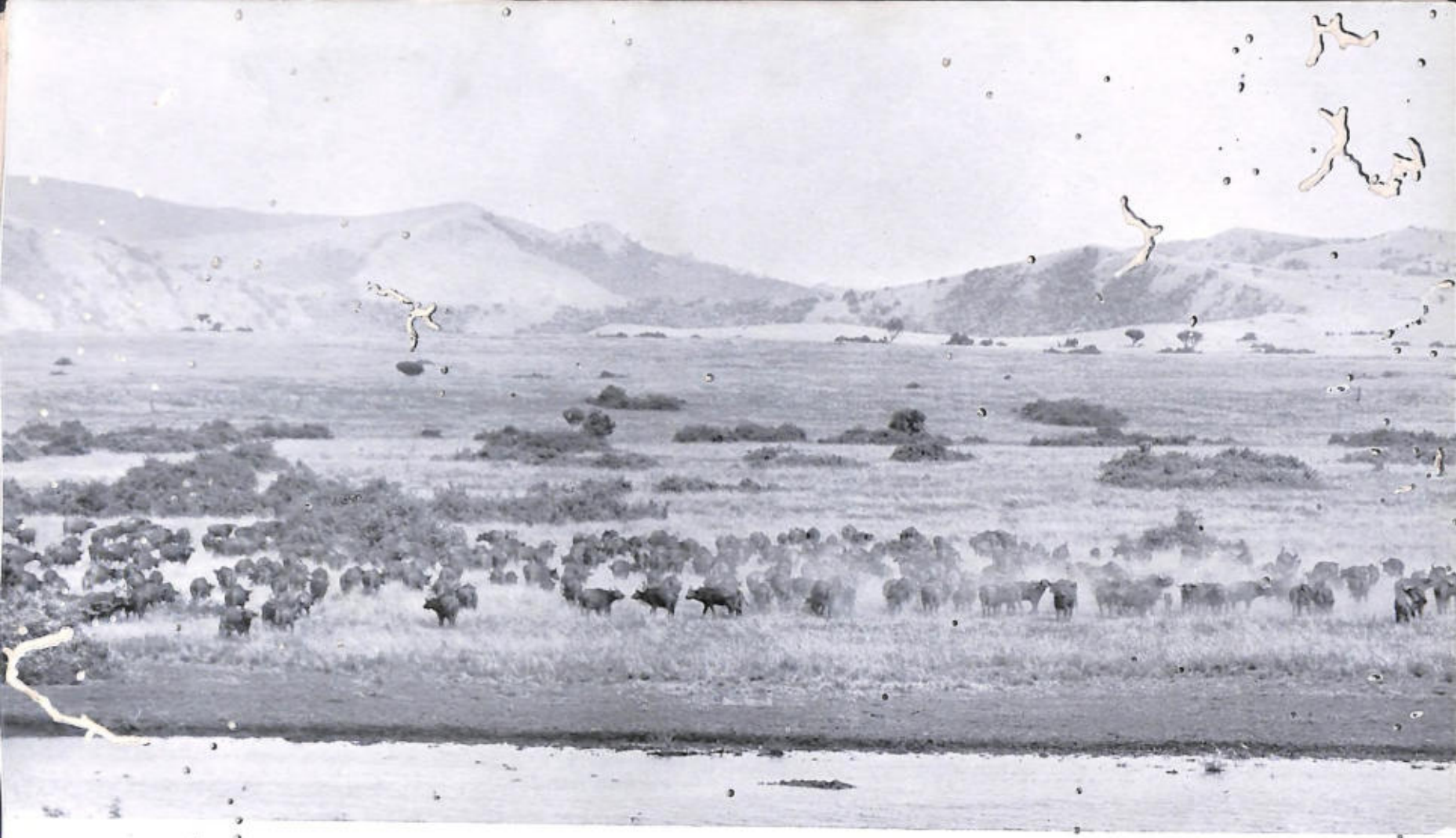


PLATE 52: *A large herd of buffalo disturbed at a waterhole*

CHAPTER FIVE

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ANIMALS OF THE RIVERS AND LAKES

Fish—Flamingo—Hippopotamus—
Crocodile, etc.

ANIMALS OF THE RIVERS AND LAKES

*

East Africa's inland water system consists mainly of a series of lakes in the floor of the Rift Valley, which are mostly small soda lakes devoid of fish life, a number of rivers flowing from west to east into the Indian Ocean and, to the west, Lake Victoria and the rivers and lakes of the Nile system.

Those rivers flowing into the Indian Ocean are mostly rapid and cold in the mountainous regions near their sources, containing little more than aquatic insects and small freshwater crabs, plus both Rainbow and Brown Trout which were introduced at the beginning of the century. They become wide and sluggish in their lower reaches, below about five thousand feet, with a good variety of aquatic life from the Hippo downwards.

The Nile system—that is, all rivers and lakes that eventually flow into the Nile—has a characteristic fish fauna which differs from that in Lake Victoria. All in all, Africa's inland waters contain one of the strangest collections of fish imaginable. Notable amongst these fish is the Bichir, *Polypterus sp.*, which appears to be closely related to a group of fishes of great antiquity; indeed, it is thought to be near the ancestor of all the modern bony fishes. It is long and cylindrical, about two feet in length, and the body is covered with large bone-like scales. The dorsal fin consists of a series of separate finlets which stretch along the back to the rounded tail. Of similar archaic construction is the Lung Fish, *Protopterus sp.*, also with a long cylindrical body but

with pectoral and pelvic fins which are filamentous and limb-like. In fact, it uses them like limbs when moving about on the bottom. This fish, of which there are several species, breathes by means of lungs, as well as by its rather degenerate gills, and dies if prevented from reaching the surface to breathe. Where it inhabits temporary water which dries out in the summer season this strange fish makes itself a cocoon in the mud, lined with hardened mucus, and lies dormant within it until the next rains fill the pond or river up again. Whilst in this state it breathes through a little funnel. This is not the only interesting thing about this fish, for the male builds a rough nest in lake or swamp margins and when the female has laid her eggs he then guards them, and the little tadpole-like young when they hatch. Growing up to six feet in length, it is a relative of that well-known archaic fish the Coelacanth, being a member of a group of fishes that was numerous some 300 million years ago.

Yet another oddity is the Elephant-snout fish, *Mormyridae*, of which there are various species, but all have an elongated snout with which they probe the mud. It emits a small electric shock which appears to be for the purpose of finding its way about in the murky water that it inhabits in the manner of a radar beam, rather than a means of defence. The Electric Catfish, *Malapterurus sp.*, on the other hand, which reaches about fifty pounds in weight, makes no bones about releasing its powerful charge should it be molested. Native fishermen always make sure that this fish is quite dead before they touch it and discharge it first by beating it with sticks.

There are many more fishes of all shapes and sizes, but they are not things that the ordinary observer can appreciate, for you have to catch them if you want to see them. Of course you may

often see a shoal of the rather perch-like Tilapia basking near the surface, or a Lung Fish coming up to breathe and flicking its tail into the air as it dives down again; and drying ponds may reveal large numbers of Catfish floundering about in their death throes. But normally fish are something that the non-fisherman misses out, although the examination of a stretch of water is always worth while. Many people miss the little plop that the Smith's Water Tortoise, *Sternothaerus sinuatus*, makes as it slips off the log that it has been basking on and quietly submerges.

More familiar perhaps is the Black Water Tortoise, *Sternothaerus nigricans* (Pl. 57), for this little fellow hides away underground during the dry season, only emerging when it rains. Then it turns up in puddles in the most unlikely places, disappearing again as soon as they become dry.

Creatures that you cannot fail to hear at night during the rainy season are the frogs. There are many species, ranging from a completely aquatic one to those that bury themselves in the ground during the dry season; but the most charming are the beautiful little tree frogs with their big red toes and black eyes. These are able to change colour and if you put them in a dark box for a while they go absolutely cream-white. They whistle at night and do not croak like many of the others do.

Interesting as all these creatures are it is the giants of the water, the Hippo and the Croc, that always attract the most excitement. But before moving on to these I must mention the Lesser FLAMINGOS, *Phoeniconaias minor* (Pl. 58-59), one of the sights of Africa. Vast congregations of these beautiful pastel-pink birds gather on the Rift Valley soda lakes, particularly on Lake Nakuru in Kenya. Thousands upon thousands of them form a great pink belt all around the edges of this shallow lake dotted here and there with a few Greater Flamingos, *Phoeniconaias major*, which stand

much higher than their cousins. All are busily feeding upon minute organisms and a blue-green alga of microscopic size that flourishes in the saline waters. Their strange honking noise is almost deafening as they strut backwards and forwards rhythmically on their long, stilt-like legs, their beaks dipping upside down into the water and scooping up the organisms which must occur in even more unbelievable numbers to satisfy such a vast concourse of bird life. The only thing that mars the spectacle is the stench that emanates from the waterside!

The most conspicuous animal of Africa's inland waters is the HIPPOPOTAMUS, *Hippopotamus amphibius* (Pl. 53-56 and Colour Pl. 2). A great fat ungainly-looking beast with short stubby legs, it is nevertheless quite agile on land and even more so in the water. Ranging from two to four tons in weight, this gigantic member of the Pig family exceeds even the Black Rhino in bulk.

During the day it spends most of its time submerged in the water, rising every few minutes to snort and blow at the surface. When danger threatens it rises so cautiously that only an acute observer can spot it; its nostrils merely touch the surface and open to expel and inhale air. Sometimes a group will lie together in the shallows, their heads resting upon each other's backs. If the temperature happens to be just right they will bask in the sun on the sandbanks, but this is an infrequent occurrence (Pl. 54). The Hippo is restricted to the water not only because its skin would dry up if not kept damp but because its body temperature is regulated closely to 96·8° F., unlike the Rhino which ranges from 88° F. to 122.2° F. and thus has a wide freedom of movement, untroubled by a hot sun. If the surroundings of the Hippo vary greatly from its body temperature then its body has to

work hard to maintain that temperature. Thus it is an essentially aquatic animal, living in a medium in which the temperature changes relatively slowly. It only normally comes ashore at night and spends the night-time in feeding, for they do not eat aquatic vegetation. Perhaps a little here and there may be taken, but their main food is grass. The Hippo grazes with its lips, the large canine and incisor teeth being only of use for fighting. So it can crop a patch of grass as efficiently as a lawn-mower. By virtue of its wide mouth it probably grazes closer than any other herbivore.

I presume that it feeds at night when it is cooler because it is easier for it to control loss than gain of heat; a large body always loses heat slowly, and the layer of fat that they have under the skin would also help to check this. But the drying of the skin must also play a part, since if it has been raining they are often loth to return to the water in the morning. Livingstone, observing this, thought that they were guided back to the water by smell, and that the rain had washed all their tracks away leaving them stranded on the land. I have seen odd ones come out on land and start feeding in the middle of the afternoon when a thunderstorm had been imminent, thus anticipating the weather conditions (Pl. 56).

They have well-worn and quite unmistakable tracks from the water, some of them traversing quite steep banks, and how the Hippo manages to haul its weight up some of them I can't imagine. If it wants to get into the water in a hurry off a steep bank it just does a belly-flop, creating a not insignificant tidal wave in the act!

Some Hippo are reputed to travel distances of up to thirty miles at night. But in an area of western Uganda where they have been studied, three to four miles seems to be the maximum,

with females never venturing more than about two miles from the water. Observations in the Congo seem to show that they have fairly definite territories which are marked out by heaps of droppings. The Hippo breaks up its droppings like the Rhino, but not in the same manner; as it defecates its tail is violently whisked from side to side, scattering the droppings over all and sundry. It does the same thing when it is in the water, presumably from habit.

An area where Hippo have recently been the subject of considerable study is the Queen Elizabeth National Park. This is situated round two lakes, Lakes Edward and George, which are connected by the twenty-mile-long Kazinga Channel. Four or five years ago, because of the appearance of over-grazing and soil erosion along the edges of the water, a census of the Hippo inhabiting the Kazinga Channel area was carried out. As they keep bobbing up and down Hippo are not easy things to count, but, after several repeat-runs had been made up and down the Channel, a careful and conservative estimate revealed that there were at least 14,000 Hippo inhabiting, in effect, some four hundred of the Park's total of seven hundred and sixty square miles. Here, too, was the best grazing, for it was found that the Hippo only selected the best grasses in their nightly foraging.

Here, then, was a population problem on the grand scale: there were many indications that the population, temporarily at any rate, was excessive. It had almost outgrown its food supply and over-grazing was evident along the edges of the Kazinga Channel and parts of the Lakes, covering in all about fifty to a hundred square miles. When man has no part in it, that dreaded enemy of tropical Africa, soil erosion, takes place very slowly and the grass cover holds on with great tenacity. One favourite grazing species, which has the rather jolly scientific

PLATE 53: *Hippo with an Egret passenger*

PLATE 54: *Hippo basking by the Kazinga Channe*

PLATE 55: *"Hippo are very prone to yawning"*
BELOW: *The Barbus which "grooms" the Hippo*

PLATE 56-57: *Lesser Flamingoes preen[illegible] early morning on Lake Nakuru, Kenya*

PLATE 58: *A large bull Hippo feeding on land in a thunderstorm*

PLATE 59: *Black Water Tortoise*

PLATE 60: *A Crocodile swimming past a shoal of fish, bottom right*

name of *Sporobolus festivus*, forms tufts like old coconut matting when dead. It is thus an important factor in retarding erosion, as it still holds the soil and prevents it from being blown or washed away. Grasses that the animals do not eat are able to take root in such areas and spread rapidly; but of course they are of no use to the faunal population.

A little erosion in the near vicinity of the water would have been of small importance. But the Hippo have been forced to extend their range inland. The males have done this by resorting to wallows during the day instead of returning to the main water. These wallows consist of small pools of water that have collected during the rainy season. When inhabited by a number of Hippo, they soon become nothing more than mud, the stench from which is indescribable. I have often wondered how animals with their acute sense of smell can seem so oblivious to foul stenches, but perhaps it is because there are worse smells in nature to an acute nose than these!

The emigration of these male Hippos, wanting to get away from it all, is one of the first signs of an overcrowded population. Other evidence is provided by the savaging of young and by frequent fighting. Hippos seem pretty bad-tempered beasts on the whole and savage fighting often takes place. The vicious canines make terrible gashes in an opponent's skin, and one hardly sees a Hippo that does not bear deep scars of some sort or another. The noise of these nocturnal fights, the booming roaring grunt followed by a succession of shorter ones, and the gargantuan splashes in the water, are among the unforgettable sounds of an African night.

Disease, so often a potent factor in controlling overcrowding, seems to be playing no part here, although numbers of Hippopotami die of various diseases from time to time in most

areas. Seldom do more than a hundred or so die in these epidemics, an insignificant part of a population running into many thousands.

The Park's authorities were thus faced with the problem of whether or not they should control the population by shooting a selected number, or allow nature to take its course and see whether it would be reduced by disease or starvation, or perhaps by a cessation of breeding. It was decided to shoot, selected areas being first cleared and then a certain number being shot every so often. So far this scheme seems to be working very well; the shooting has not caused any alarm amongst other inhabitants of the Park, nearby Buffalo not even looking up when a shot is fired. The decision too was welcomed by the local native populace who were able to buy the meat, and it is hoped to provide a regular supply in this manner.

There are conflicting suggestions about what caused the increase in Hippos. One was that the small number which native hunters shot before the area was protected by its Park status kept them down previously. I find it hard to believe that such a delicate balance in population between man and beast could have been achieved in this manner. Conditions in this area are ideal for the Hippo, the only predators being Hyaenas and Lions which take isolated calves. Crocodiles are absent from the area although fossils show that they were present in past ages. Hunting has been officially prohibited since 1925, when the whole of the area was closed to all races on account of sleeping sickness; but it was not until 1952 that it achieved Park status. We do not know whether the population has built up suddenly or gradually, but all animal populations tend to oscillate and it is probable that this is just a peak period. Such factors as food and predators generally serve to keep populations down, but here these have been of minor

importance so far. A succession of several dry seasons could well result in a disastrous decline in the population.

In restricted areas of water such as a lake in the bottom of Ngorongoro Crater and the pools in the Nairobi National Park, the Hippo populations only increase very slowly. But this could be attributable to the inbreeding of such closed populations.

A small spring in the Tsavo National Park of Kenya provides a remarkable place for watching Hippos; owing to the crystal clearness of the water their actions underneath the surface can be observed. They are fully at home when submerged. All activities such as mating, birth and the feeding of the young take place in the water, and they can often be seen nuzzling one another and playing. Playing usually consists of mock battles with the mouth wide open, accompanied by a sort of bobbing up and down. Hippo are very prone to yawning. Every so often one will rise to the surface and often stretch right up out of the water with its cavernous jaws gaping open. On land this seems to be used as an attitude of threat. When I have approached an animal closely it has often run along with its head held up and its mouth wide open. If it is a threat it certainly serves its purpose—it is a most terrifying sight, especially when it is remembered that the jaws are quite able to bite a man in two!

When the Hippo are in the water a number of fish, particularly a species of Barbus, *Barbus hindei* (Pl. 56), "groom" them. Swimming over them, their prehensile mouths working like vacuum cleaners, they presumably clean the hide of organic debris, leeches and other parasites. One can sometimes see these fish threshing in the water as they try to pull off some particularly resistant morsel. It is doubtful if the Hippo obtains any real benefit from such attentions as it is host to few external parasites.

Surprising as it may seem, it carries a tick, mainly round the ears which are of course often out of the water. But it is a very rare tick—only some dozen specimens have been collected in over a century.

Incidentally the prolific fish populations of the Kazinga Channel and its two lakes are thought to be due in no small measure to the fertilisation of the water by the Hippos, who deposit many tons of manure daily into the water after their nightly feeds. I did hear somebody remark that the Hippo was of no use to man. Well, here's one example of its usefulness, and another is thought to lie in its destruction of reeds and papyrus in rivers, thus keeping the waterways open.

A final fact about the Hippo is that, when it comes out of the water, it exudes a reddish secretion over its skin, which gave rise to the old tale that the Hippo "sweats blood." This strange belief was disproved more than a century ago, but the belief persists. It is not of course blood, but a red pigment whose function seems to be to act as a kind of suntan lotion!

When the Hippo is not breeding both it and the CROCODILE *Crocodilus niloticus*, live quite happily side by side. In waters where they both occur it is no unusual sight to see them swimming about together. But the Crocodile always seems to give way to the Hippo; and even when lying on land it does not let a wandering Hippo get too close before it hurries out of its path.

The Crocodile is of course a reptile and a very ancient one at that, being related to the Dinosaurs. The first typical ones appeared nearly 180 million years ago, and although the Crocodiles were amongst the least progressive of the "Ruling Reptiles," as the Dinosaurs and their kin were called, they

PLATE 61: *"One by one they quietly creep out to see what you're up to."*
The Rock Hyrax

PLATE 62: *A Porcupine entering its burrow*
BELOW: *Travelling along underground in its burrow*

survived where all the others failed, having undergone hardly any modification from their early progenitors. Their hind limbs, for example, are still longer than the fore ones, just as they were in the Dinosaurs.

It is thought that the Dinosaurs may have swallowed stones to assist in the mastication of food in the stomach, because numbers of rounded polished stones are often found amidst their fossilised bones and are foreign to the rest of the soil. Living Crocodiles also have large numbers of smooth pebbles in their stomachs; but these are thought to serve a hydrostatic function, enabling the Crocodile to be more proficient in the water.

Owing to the way in which the jaw bones are arranged the Crocodile cannot chew its food and can only hold it in the mouth. For this reason it must either feed upon small prey or upon large animals that are putrefying. In order to obtain food from the latter it seizes a part in its jaws and then spins over in the water, twisting the meat off. To swallow, it raises its head out of the water, letting the food fall into the back of its throat. The need for the flesh to be soft has led to the Croc's habit of secreting newly killed animals in some underwater retreat until they are rotten.

The Croc is abhorred by most people because of the slyness of its attack and the fact that it has no compunction in dealing with human beings in the same manner as it deals with other animals. But it does not seem to be such a ravenous beast as it is often made out to be. On one occasion I watched a fairly small one swim quite unconcernedly past a shoal of fish, who likewise took not the slightest notice of it (Pl. 60); yet one imagines that they would instantly escape from such a predator. We can see a resemblance here to the behaviour of the Lion. The Croc is an equally lethargic creature, although able to move like lightning

if the occasion demands it. Even where food is plentiful Crocs are often found with empty stomachs.

The food of the Croc varies with its age. After hatching from the egg, which unlike those of most reptiles is buried in a sand-bank and guarded by the parent until it hatches out, it feeds upon insects. As it grows larger it graduates to small fish, and not until it is several feet in length does it turn to mammals and large fish. In its early stages its life is very hazardous, as the eggs are greatly esteemed by the large Monitor Lizards, *Varanus sp.*, which dart in and dig them up should the parent turn her back for a moment. When the youngsters hatch, flocks of Marabou Storks are often waiting to seize the little lizard-like creatures, for they are then left to fend for themselves.

Owing to the value of their skins large Crocs are highly prized by poachers and so great has been their slaughter that they are in danger of extinction in many areas. One of the finest places for viewing Crocs used to be the Murchison Falls in northern Uganda, where the Victoria Nile plunges through a gap in the rock a mere nineteen feet wide at its narrowest visible point, and a hundred and thirty feet high (Pl. 4). Until recent poaching drastically reduced their numbers Crocs occurred in incredible numbers just below the Falls, and are thought to have fed upon dead and stunned fish that were continually being washed over.

Sir Samuel Baker, on his voyage of exploration in 1864, remarked upon their presence in his book, *Albert N'yanza, Great Basin of the Nile*: "I never saw such an extraordinary show of Crocodiles as were exposed on every sandbank on the sides of the river. They lay like logs of timber close together, and upon one bank we counted twenty-seven of large size; every basking place was crowded in a similar manner." This spectacle lasted

until 1959, but their large size and great numbers were too tempting for the poachers.

Both the sizes and the ages which Crocs reach have, as one might expect, been grossly exaggerated in writing. We don't know just how long they do live but, being reptiles, they could reach a far greater age than the longest-lived mammals. Unlike the latter, when one set of teeth is worn out another pushes up; but how often this happens is unknown. As to their size this averages about twelve feet in length when adult; stories of thirty feet Crocodiles are complete fantasy.

A quaint story concerning the Croc is that of its association with a bird called the Egyptian Plover, *Pluvianus aegyptius*, which is said to possess the bold habit of picking the Croc's teeth as it lies basking in the sun, and of even picking leeches out of its mouth. In return for this service they are supposed to warn the Croc of impending danger. Although a recent investigator into the habits of the Croc confirmed the truth of this association, there are very few first-hand accounts to substantiate its being at all regular. But the first account goes back a very long way indeed to the writings of the Greek historian Herodotus, who lived from about 485 to 425 B.C. and who wrote: "All other birds and beasts avoid him [the Crocodile], but he is at peace with the Trochilus [the Egyptian Plover], because he receives benefit from that bird. For when the Crocodile gets out of the water on to land, and then opens its jaws, which it commonly does towards the west, the Trochilus enters its mouth and swallows the leeches; the Crocodile is so well pleased with this service that it never hurts the Trochilus."

Other birds have also been linked with the Croc: the Buff-backed Heron, *Bubulcus ibis*, is also said to pick leeches off its skin, whilst the Water Dikkop, *Burhinus vermiculatus*, although it does

not manicure it, is said to warn the Croc of danger in return for being allowed to nest near it in order to protect its eggs from the ravages of the Monitor Lizard. Many other birds, such as the Marabou Stork, treat the Croc with complete unconcern when it is basking on the river banks, strutting freely around it. Now and then a Croc will snap at a bird, but they do not seem to be quick enough to catch them on land, although the occasional presence of feathers in their stomachs show that they do get the odd waterfowl.

The Croc's habit of basking with its mouth wide open is very common, but it is doubtful if this has any connection with letting the birds have free access. I can hardly imagine it being inconvenienced by having pieces of flesh sticking to its teeth, although it is true that leeches are sometimes present in the mouth in quite large numbers. As to the real reason why it basks with its mouth wide open, this is probably to keep it cool; we can liken it to the panting of a dog on a hot day. Should a searching Trochilus, to use Herodotus' name, spy a tasty morsel in the open mouth, no doubt it would make a quick dart at it; but I doubt whether they walk about quite unconcernedly in the Croc's mouth, as seems to be generally suggested.

The senses of the Croc are acute and it may be this fact alone that has enabled it to outlive its Dinosaur relatives. In areas where they are timid they are extremely difficult to approach. Long before one gets anywhere near them, whether because of sound or the spotting of some movement, and even though they appear to be fast asleep, they are suddenly galvanised into action and hurl themselves bodily into the water with a mighty splash, sinking from view immediately. If you wait you may then just see the eyes and nostrils break surface as they come up to take a quiet look to see if you're going to enter the water! Woe

betide anyone who gets too close to the edge after thinking that they have frightened a Crocodile away.

In areas like the Nairobi National Park where they are very used to people the Crocs soon come to ignore their presence. They lie asleep in the sun oblivious of talking, shouting and even the odd stone that irresponsible people may throw at them. So motionless do they remain that I have heard more than one person swear that they were stuffed!

CHAPTER SIX

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SOME SMALLER FRY

Hyrax—Porcupine—Squirrel—Dikdik—
Bat-eared Fox, etc.

PLATE 63: ABOVE LEFT: *Tree Hyrax*
BELOW LEFT: *The Bush Squirrel*

ABOVE RIGHT: *Bat-eared Foxes*
BELOW RIGHT: *A Ground Squirrel*

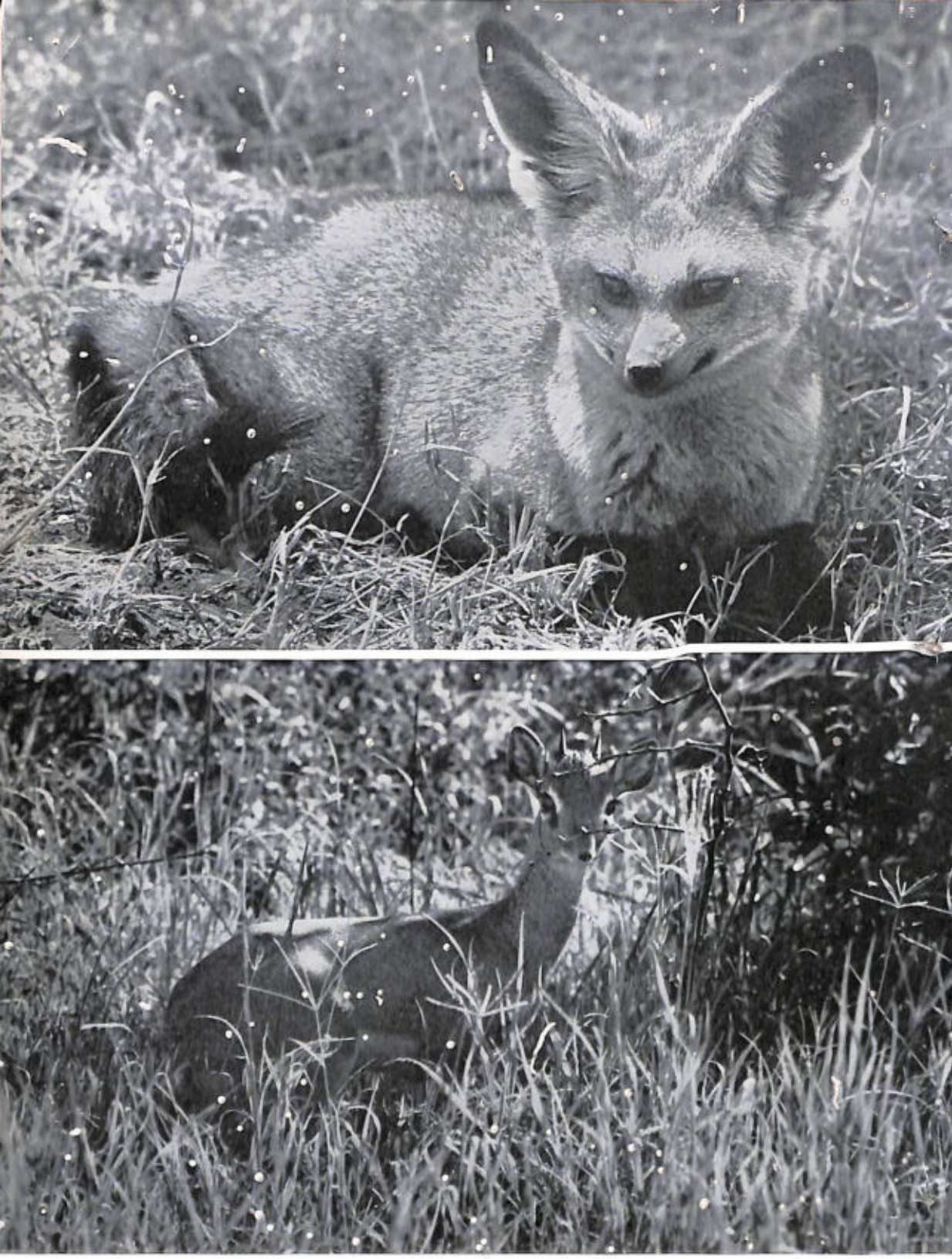

PLATE 64: *Bat-eared Fox*
BELOW: *A male Dikdik*

SOME SMALLER FRY

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In writing so far about some of the animals of East Africa I have, like most other authors, restricted my remarks to the large and more obvious ones. The reason for this is not hard to find: abysmal as our knowledge is concerning the larger fauna, it is even more so when it comes to the smaller animals. The majority of the small mammals are nocturnal and very timid, so that observing them is no easy matter, interesting as the habits and life histories of many of them are.

But let us start with what I consider to be the most fascinating of all the smaller mammals, the HYRAX. This strange little creature, about the size of a Rabbit but having small rounded ears, has an extraordinary mixture of different characters. The structure of part of the ear is similar to that found in Whales, the upper incisor teeth are like those of rodents, and the lower ones are more like those of Lemurs. The molar teeth look like those of the Rhinoceros and indeed led Cuvier, a renowned French zoologist, to call them "little Rhinoceroses." Two pouches in the stomach resemble a condition found in birds, and the arrangement of the bones of the fore-limb are like those of the Elephant. It has four digits in the hand and three in the foot, a condition that is not found in any other group of mammals. In spite of all these and several other unique features it is considered to be allied to the Elephant, and this jumble

of characters merely indicates the great conservatism of its evolution.

Ancestors of the Hyraxes have been found in the deposits of Upper Egypt of about fifty million years ago. These beds are a little younger than those containing the first fossils of *Moeritherium*, but the Hyraxes are thought to have branched off from the Elephant line before the latter appeared. The Hyraxes never underwent the great development and expansion of the Elephants and have remained almost confined to Africa. One species seems to have succeeded in extending its range to southern Greece in past times, at a later date some extended their range into Syria.

Hyraxes are herbivorous and there are two main types, the Tree Hyraxes, *Dendrohyrax validus*, and the Rock Hyraxes, *Procavia sp.*, often called Rock Rabbits or Dassies. Anyone who has spent a night in or near the forest in East Africa is almost certain to have made the acquaintance of the former (Pl. 63), for its terrifying cry has struck fear into the heart of many a new arrival. Starting off like the creaking of an old door it ends with a piercing scream that sounds as if somebody is being murdered. Although this is the typical call it varies somewhat in different parts of the country.

During the day, if the weather is fine, the Tree Hyrax spends its time either sleeping out on a suitable branch in the sun, or sitting with only its head poking out of a hole in the tree—it always chooses hollow trees to live in. It is, however, not easily seen as the Hyrax usually hears one's approach from at least twenty yards away, even if supposed to be fast asleep; and it disappears into its hole in a flash. Little wonder too, because the natives favour them as a delicacy. Thus to see the Tree Hyrax you must first spot likely-looking trees from a distance and then

stalk up to them. If you see one and it disappears I have found that it usually reappears after about fifteen to twenty minutes. They are often said to be solitary animals, but my own observations do not confirm this. There were certainly more than one in the old fig tree that I used to watch. I have seen two trying to look out of the same hole at once, and as many as three have been visible in the same tree. They forage for food at night on the ground as the little runs from the base of their trees denote. Although agile enough in running about the branches and up and down a trunk, they have not the dexterity of a Monkey or a Squirrel and are probably more at home on the ground.

Their close relatives the Rock Hyraxes (Pl. 61) feed in the early morning and late evening, coming out of the rocky retreats where they live and entering the surrounding vegetation. As their name implies they live in rocks, and also in colonies; but the size of the colony rather depends upon the number of suitable places available. Thus some small rocky outcrops only contain three or four animals, whereas suitable large areas may have a colony running into hundreds. They particularly favour the steep rocky walls of the Rift Valley, and I have never ceased to marvel at some of the seemingly inaccessible positions that they colonise, which look as if there is no way to them except via a sheer rock face. They are extremely expert climbers but do not appear to be particularly adapted for this; the palms of their feet are flat and rather clammy to touch but that is all. The nails are flat and human-like, except for the inner hind toe which has a very simple claw, an almost identical one being found in Bush-babies. This claw is said to be used for toilet purposes, but may also be an aid to climbing.

The colonies are fairly easily spotted from a distance because

of the streaked appearance of the rock face, caused by their urine. Like the Tree Hyraxes they have the habit of always defecating in the same place, and where the urine runs down the rock face the latter often has a completely glazed appearance. This may either be due to countless generations urinating in the same spot or to the fact that the urine is excreted in a concentrated form, or a combination of both. The Rock Hyrax is another animal credited with the ability to go without water and the areas which they inhabit certainly seem to be pretty waterless.

During the morning and afternoon, but not the hottest part of the day, they lie out sunning themselves on the rocks. In quiet areas where they are little disturbed they are extremely inquisitive and most amusing to observe. If you climb into their rocky retreats they wait until you are within a few feet of them before running squeaking into the crevices. When they have all disappeared the thing to do is to hide in the rocks and wait. One by one they quietly creep out again to see what you're up to, the large old males first. I well remember when I first did this. Hiding in a crevice, I began almost to feel that I was being watched and occasionally I heard a strange little scuffle or a muffled squeak. When I thought that I had waited long enough I poked my head up and almost fell over backwards. I was completely surrounded by hundreds of them, all staring at me intently. Of course when I showed myself there was great consternation and, with squeaks and cries, many of them bolted immediately into their holes again. You never knew where they were going to appear next; every now and then a big old male would creep up to within about six feet of my back and I would suddenly turn round to find him quietly watching me. It is the curiosity of the Hyrax which unfortunately makes it so easily trapped by the natives.

Another amusing habit of the old males was to sit on a rock watching one and then draw back their lips, exposing their long incisor teeth. I presume that this was meant to frighten me, but it actually looked as if they were grinning!

Not the least interesting thing about them is their lice, for Hyraxes must be the lousiest of all animals! They possess at least twenty-five different species, and it is said that an expert can tell from what part of the country a Hyrax has come merely by looking at its lice. In striking contrast to those of all other mammals, the lice have evolved faster than the Hyraxes.

There is no connection between the Hyrax and the PORCUPINE, *Hystrix sp.* (Pl. 62). But in contrast to the marked curiosity of the Hyrax, the Porcupine has proved to be one of the most cunning and evasive of all the smaller mammals that I have come into contact with. Most peoples' acquaintance with it doesn't extend further than the quills that it leaves about in its nightly ramblings. But its holes are quite easily found, usually being situated in forest areas, and well-worn tracks lead to and from them.

Nocturnal as this animal is, it is on rare occasions found lying up in the undergrowth during the day in remote areas; but this may be when there are young in the burrow. I have found that they normally leave their holes at any time from dusk onwards to about half-past nine. It is often said that the Porcupine adopts the disused holes of other animals such as the Aardvark, but I have found that it is a most careful and painstaking home-builder, often choosing a well-drained slope. If it is much persecuted the burrows are of great complexity and extent with as many as five different entrances and exits, and covering a considerable area; some of the holes are as much as thirty feet apart. Usually there

is one main one which opens out inside and has several tunnels radiating from this enlargement. In other parts some of the tunnels are so narrow that it must be impossible for a Porcupine to back along them.

In the season when the native maize is ripe the Porcupine often temporarily adopts old holes near the maize fields, and I presume that this is how the story of their being temporary dwellers has arisen. They cling to their traditional homes with great tenacity and even if the forest is cleared and planted they still remain there. As for the Aardvark or Antbear, *Orycteropus afer*—a strange nocturnal ant-eating animal, almost hairless and with a long snout and big ears—I can find no evidence of its living in burrows at all in Kenya. The natives say that it sometimes spends the day in a hole that it has dug after termites, but as often as not sleeps in the undergrowth, and this I have reason to believe is true. The most one ever sees of this wary animal is the excavated termite nests after its night's work.

The Porcupine is of course a rodent, and a fully-grown one with its quills erect looks enormous, reaching a height of about three feet from the ground. Like the European Badger it leaves its hole very quietly and cautiously, but once outside and on its old familiar pathways it no longer worries about being quiet, and lets all and sundry know of its presence. It knows that its quills make it safe against most things it will meet. It does not shoot them at an enemy, neither are they barbed like those of the American Porcupine; but they come out very easily and stick readily into any attacker. Its usual method with an aggressor is to make a violent noise by rattling its erected quills and, if this doesn't have the desired effect, it suddenly runs backwards into it. This usually stops any further nonsense.

It is not known whether Porcupines lead a solitary life, only

pairing for the mating season, or whether the solitary ones are old animals. I think that the latter is most likely but it is extraordinary how little we know about such a common animal.

Naturally enough we know a little more about the habits of animals that are easily seen. Amongst the commoner of small mammals in some areas are the SQUIRRELS. There are many different kinds in Africa, even "flying" ones, but I propose only to deal with two that I am familiar with.

The first of these is the Bush Squirrel, *Paraxerus ochraceus* (Pl. 63), an agile little fellow that is very much like the Grey Squirrel of Britain, although I don't think it is quite so timid. As its name implies, it tends to occupy "bush height"; that is, more of its time is spent in the middle layer rather than in the tops of trees or on the ground. If one walks quietly through a lightly forested area in the afternoon, it can easily be seen darting madly about and leaping from branch to branch. When it is moving the hairs on its tail are held out straight, making it almost transparent and enabling it to be used as a gliding and balancing agent.

It seems to forage in the morning and in the late afternoon; it is quite regular in its habits and visits set places at certain times. When I was laying bait for one, if I was as much as half an hour later than my usual time in putting it down in the evening, then it would not take it until the next morning when it came round again.

This life in the trees is quite different from that of the Ground Squirrel, *Xerus rutilus*, particularly the one inhabiting the northern district of Kenya and similar arid areas. This species is extremely common in such places and lives in holes in the ground. One's first acquaintance with it is usually the sight of it dashing madly

for its burrow, but a little bait will soon bring numbers of them into the open. If you put out a fairly large amount of bait they do not all rush at it at once. First one will dash across, take its fill and dash back to deposit it in its burrow. As soon as it leaves the bait, another will dash in from another direction and so on. There are hardly ever two present at the same time, and indeed a squabble ensues should one approach before the other has finished. But the quarrel is only momentary, one of the two darting away again. Strangely enough when they are not doing this they all live quite happily together, frolicking and rolling about in the dust, often lying on their sides and kicking it over themselves. Like most rodents their greatest enemies are snakes and birds of prey, and every so often one will stand upright on its hind-legs and view the surroundings, to make sure that nothing is creeping up on the group unawares (Pl. 63).

Where this animal is seen you will also see the DIKDIK, *Rhynchotragus kirkii*, a tiny and lovable little Antelope with a long snout that it wriggles from side to side. It is only a foot or so high and the male has a small pair of horns (Pl. 64). They are often in pairs and are more frequently seen in arid areas where there is little undergrowth.

The BAT-EARED FOX, *Otocyon megalotis* (Pl. 64), is another rather sweet little animal that in certain seasons is often seen out on the plains. It is not infrequently persecuted by the ignorant although it is quite harmless, for despite the fact that it is a member of the Dog family, its teeth are too weak to tackle anything other than insects and small birds and mice. It is very fox-like in appearance although its large black ears make it easily recognisable. It breeds in burrows out in the open and this is when it is most often met with; at other times it is mainly an

animal of the late evening. A pair sitting outside a burrow is a sure indication that there are young inside. If they are chased away and you sit and watch, sooner or later one of the inquisitive youngsters will poke its head out of the hole to see what's going on. And then perhaps another, and then another will do likewise (Pl. 63). While this is taking place the parents usually circle around at some distance, emitting a whistling call; and if the young ones are old enough they will all suddenly dash out of the hole and join them.

Of course there are hosts and hosts of other small creatures inhabiting bush, forest and plain. Look at the multitudes of rats and mice alone, ranging from mice so small that you could sit them comfortably on a penny, to the Giant Rat, *Cricetomys gambianus*, three feet long from the tip of its nose to the tip of its tail, and a harmless herbivore. This nightmarish creature is heavily infested with a peculiar insect (*Hemimerus talpoides*) that is a degenerate kind of earwig, for it is blind and without wings like the normal earwigs. It is not really a parasite for it is said to only feed upon scurf and upon fungal spores that would otherwise cause the Rat's hair to fall out. They are found only upon these particular Rats.

Superficially similar to the rats and mice are the odd-looking, long-snouted Elephant Shrews, *Macroscelididae*, that are often met with jumping about at night. And then there are the small carnivores such as the Genet Cat, *Genetta genetta*, looking something like a "Tabby" in colour, and the large White-tailed Mongoose, *Ichneumia albicauda*, that runs round busily at night sniffing here and there in search of titbits and soon entering a chicken coop if it is not properly secured. Then, the incessant background noise of the African night is often broken by the

plaintive cry of the Bush-baby, *Galago crassicaudatus*, that lovable little monkey-like animal that is able to leap through the tree tops in the dark. The most one is likely to see of it are its large pink eyes caught in the beam of a torch, unless you are lucky enough to find its resting place in the daytime. This is no more than a few twigs in the crotch of a tree, just enough to break up its outline; but although it's supposed to be asleep during the day you will see its two ears poking over the edge as it follows your movements.

Yes, the African forest *is* alive at night with all manner of small creatures, but they are not as numerous as one might suppose. You might see a Bush-baby one night and then perhaps not again for another six months or more. Most of these animals take care not to follow the same path twice in quick succession, and it is this that makes them so hard to observe, for you never know where they are going to turn up next.

We could go on, listing animal after animal, all interesting and fascinating in their habits, about which little is known. Each of them holds a store of surprises would we but spare the time and a little patience to unearth the secrets of their lives. Even new and hitherto unknown species are undoubtedly waiting to be spotted by some observant enthusiast, especially among the vast array of rodents. There are still plenty of areas in East Africa where a little systematic inquiry is almost certain to unearth something new, nothing very big but sufficiently different to excite the specialist.

It is the prerogative of the uninitiated to think that the naturalist is mad, it always has been and it still will be for a very long time. I know that people of my acquaintance thought me to be, as night after night I diligently sojourned in the dark of the forest by a Porcupine's hole, bitten to death by mosquitoes,

waiting for something that nine times out of ten never appeared; surely there was more enjoyment in a pint of beer and a friendly bar? And what on earth was the attraction in the still-steaming mountain of Elephant's droppings that I so carefully and excitedly dissected in my search for parasites? The naturalist finds his activities difficult to explain as isolated instances, but the pattern of life which emerges from persistent inquiry must surely interest even the most indifferent of onlookers.

Africa, as a place for study, screams out to the naturalist and scientist with open arms, and when more people come to answer her call the unfolding panorama of life cannot fail to amaze even the searchers themselves.

THE END


Lake Rudolf
Murchison Falls N.P.
Marsabit Nat. Reserve
Lake Albert
UGANDA
KENYA
Lake Nakuru Bird Sanctuary
Queen Elizabeth N.P.
Entebbe
Mt. Kenya N.P.
Lake Edward
Lake George
Gorilla Sanctuary
Mara N.R.
Aberdare N.P.
NAIROBI
Nairobi N.P.
Lake Victoria
Lake Kivu
Ngong N.R.
Serengeti N.P.
Amboseli N.R.
Tsavo N.P.
Ngoro Ngoro
TANGANYIKA
Indian Ocean
Dar es Salaam
Lake Tanganyika
Selous National Reserve
Lake Nyasa
National Parks and Reserves in East Africa prior to 1961.
National Park
National Reserve

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The main references to the most important animals are printed in bold figures; photographs are shown as *Pl. 1-64*