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The Animal Kingdom  
Large Mammals





Leopard

BOOK NO.

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The Animal Kingdom

# Large Mammals

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## Preface

The Animal Kingdom includes man, as it includes the minutest unicellular organisms—animals so small and inanimate that even for experts it is sometimes difficult to distinguish them from plants. Within such extremes of structure, activity, and intelligence exists the whole Animal Kingdom—the mammals, birds, reptiles, amphibians, fishes, and the hosts of insects and other invertebrates.

At first sight this great and magnificent world of living things often seems chaotic, overcrowded and uncontrolled, a world where things appear haphazard and to occur without reason. To find order here, and to see cause as well as effect is not simple. Indeed, it takes even a patient man a lifetime to gain an understanding of the Animal Kingdom.

This apparent confusion is not helped by man's paradoxical relationship with the rest of the Animal Kingdom. On the one side men ruthlessly hunt and exterminate animals for the love of sport, indiscriminately employ insecticides and chemical fertilizers that harm insects and small animals beneficial to man, and until recently practiced methods in the slaughter houses that were little short of barbaric. This contrasts strangely with the researches in zoology, animal husbandry, and veterinary surgery, the work of naturalists and

conservationists trying desperately to preserve species in danger of extinction, and the active delight that many people—both young and old—take in just watching wildlife.

With men's interests so diametrically opposed it is not surprising that understanding is difficult. Order is there to be found, however, and knowledge and observation are the first steps to it. For most people, unfortunately, first-hand observation is only possible on a local basis, and for information on animals living further afield we have to rely on the observations and knowledge of others.

It is the purpose of the Animal Kingdom Series to provide this experience and knowledge—the fruits of many years' patient work by seven eminent naturalists and zoologists. The Series will comprise of six volumes covering the whole Animal Kingdom. Each title will be world-wide in coverage and provide reliable and related information, the essential features, natures, and ways of life of almost every family of animals. But this is not all, for from amongst this wealth of illuminating and fascinating material arises a picture of a world where life is anything but chaotic, disordered, and unrelated—a picture that may help towards an understanding of the Animal Kingdom as a whole.

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# Contents

INTRODUCTION viii

## TOOTHED WHALES 4

Beaked Whales 6 - White Whales and Narwhals 7 - Dolphins 10 - River Dolphins 14 - Porpoises 15

WHALEBONE OR BALEEN WHALES 16 - Grey Whales 16 - Rorquals 17 - Right Whales 20

## WILD DOGS 22

Wolves 23 - Jackals 28 - Foxes 29  
Foxlike Wild Dogs 33

## BEARS 38

Black Bears 39 - Brown Bears 42 - Polar Bears 44 - Sloth Bears 46

## RACCOONS AND THEIR FAMILY 46

## THE WEASEL AND ITS RELATIVES 53

Weasels 53 - Minks 57 - Poilecats and Ferrets 58 - Martens 60 - Tayras, Grisons and Zorillas 62 - Wolverines 63  
Badgers 64 - Skunks 67 - Otters 70

## THE GENETS, CIVETS, ETC. 73

## HYENAS AND AARDWOLVES 79

## THE CATS 83

Lesser Cats 84 - Lynxes 87 - Big Cats 89

## EARED SEALS OR SEA LIONS 98

## TRUE SEALS 104

Dugongs and Manatees 111

African Elephants 116

Asiatic Elephants 118

Whales,  
Dolphins and 2  
Porpoises

Carnivores 22

Sea Lions and Seals 98

Sea Cows 110

Elephants 114

**Hyraxes 120**

**The Odd-toed  
Hoofed Mammals 121**

**The Even-toed  
Hoofed Mammals 133**

**THE WILD HORSES 121**

**THE TAPIRS 126**

**THE RHINOCEROSSES 128**

**PIGS, PECCARIES AND  
HIPPOPOTAMUSES 133**

Wild Pigs 134 - Peccaries 136  
Hippopotamuses 137

**CAMELS AND LLAMAS 140**

**CHEVROTAINS 144**

**DEER 145**

Musk Deer and Muntjaks 146 - True  
Deer 147 - Hollow-toothed Deer 154  
Moose 157 - Reindeer 158 - Roe Deer 161

**THE GIRAFFE FAMILY 162**

**BUFFALOES AND WILD CATTLE 165**

**PRONGHORNS 172**

**ANTELOPES 173**

Antelopes with twisted horns 174 - Deer  
Oxen 178 - Duikers 178 - Marsh  
Antelopes 179 - Sables, Gemsboks and  
Addaxes 181 - Deer Antelopes 183  
Gazelles 185 - Dwarf Antelopes 189  
Blackbucks 190

**GOAT ANTELOPES 191**

Rock Goats and Gazelle Goats 191  
Ox Goats 194

**WILD GOATS AND SHEEP 196**

True Goats 196 - Wild Sheep 198  
CHECK LIST 201

# Introduction

Many and wonderful are the differences we find among the mammals that live in the world today. They vary in size from the tiny shrew that weighs only a fraction of an ounce to the gigantic whale that weighs a hundred tons. They vary in habit from the timid little squirrel that feeds on acorns to the amiable dolphin that plucks fishes from the deep, and the ferocious big cats that sometimes prey even on man.

Outside man's domain, the mammals have made themselves at home practically everywhere. Looking at some of the hard, unfriendly places where they have settled, we are often compelled to marvel that they could survive there at all. We discover mammals living under conditions ranging from intense cold to tropical heat, from the rarefied air of snow-capped peaks to the depths of the ocean. On fields of floating ice and in the heart of the arid, burning desert, mammals have made their dwelling places.

Some mammals, such as the bats, have taken to the air. Others, like the squirrels and monkeys, have entered the forests and climbed the trees. The whales and seals have left the land and gone to live in the sea. Mammals have covered the face of the earth; some, such as the gopher and mole, have burrowed underground. Wherever there was living space for them, the mammals have moved in.

An outer covering of hair is the peculiar property of the mammals. Not every mammal possesses one—a few, like the whale, are practically hairless. On the other hand, we do find hair on the bodies of most mammals. This is in sharp contrast

to other classes of animal life. The birds, fishes, and reptiles are not protected by such a growth.

Still, this covering is only one of the typical features of the mammals. Strictly speaking, we consider everything that lives and is not a plant to be an animal—just what is it that makes us call this group of animals "mammals" and nothing else? The name "mammal" comes from the Latin word *mamma*, meaning "breast." The mammals have glands that produce milk which they use to feed their young. Except for a few primitive mammals, which lay eggs, all bear their babies alive, and even the egg-layers suckle their young. It is in these characteristics that we find the sharpest differences between the mammals and other animals.

Mammals, of course, possess backbones and breathe air. Even a whale will drown if it cannot surface regularly to draw life-giving oxygen into its lungs. Like the birds, but like no other animals, the mammals have a four-chambered heart and a complete double system of circulation—on one side impure blood is carried to the lungs, where the poisonous gases escape; on the other side, after being refreshed with oxygen, the blood is piped back to the rest of the body.

Unlike the fishes and the reptiles—but again like the birds—mammals are warm-blooded. To maintain their body temperature, they rely not only on their hairy covering, but on still another mechanism other animals do not have: the sweat glands.

There are never more than two pairs of limbs on a mammal. Some mammals,

like the kangaroo, have hind legs that represent an extreme in development. At the opposite end of the picture is the whale, which has lost its hind limbs altogether and acquired flukes to help it move about in the water. Every mammal has front limbs, even the bats, which have developed them into wings for flight. In the whale they have become flippers. Look at the skeleton of a whale the next time you visit a museum and you will see the bones—vaguely reminiscent of those in the human hand—that gave the flippers support when the huge creature was alive. The driving power of most mammals is centred in their hind limbs. All fast runners have longer tips on their toes to increase their speed, and they possess cushioned pads for support. Some, like the sheep, deer, and horses, have their toes encased in hoofs, and the middle toe or toes take over the function of the foot, at the expense of the other toes.

As a rule, the senses of sight, taste, smell, hearing, and touch are well developed in the mammals. What an animal lacks in one sense, it frequently makes up in another. The mole, for example, is almost completely blind, but it has a highly sensitive nose and tail to guide it around in the darkness.

Some animals also tend to specialize in the development of one sense organ though not at the expense of another. The monkeys and their relatives, spending their lives in the trees, where vision is at a premium, often have unusually large eyes. In the deserts, where the sun is dazzling and where there is little opportunity to find cover, we often observe that the animals possess big ears, helping them to detect danger while it is still far off.

Most mammals live in a dull, grey world. Only a few—the apes, for example—have colour vision. Others—usually animals

that are active at night, like the cats—are famous because their eyes glow in the dark. The eyes, however, do not generate any light themselves; they merely catch up and reflect whatever light is present in the gloom. Behind this remarkable power lies an interesting fact. The inner wall of the eye is coated with a substance called "guanine." This has a metallic lustre of silver or gold and brightens dimly lit images on the retina of the animal's eye so it can see them better.

The sense of touch is far more vital to an animal than you might suppose. Almost every motion is closely connected with the sense of touch. Nerve fibres end in tiny raised points on the skin which are known as touch spots. Except on the soles of the feet, a touch spot usually has a hair on it. The hairs themselves are not sensitive, but they act as levers to press the touch spots. Animals are guided in running or walking by this sense of touch. The long hairs or whiskers on the nose of the cat are connected with touch spots and supplement sight in dim light.

The sharpest sense of animals is sight. It is the swiftest too. Seeing takes place with the speed of light. Falcons, hawks, and the fastest beasts of prey hunt by sight. A tiger may track a goat by scent, but the final leap is guided by sight. Still, many animals possess a means of defeating this exceedingly sharp sense. Protective colouration can create an optical illusion that will deceive the keenest observer. How inconspicuous an animal may be depends on how well it blends in with its surroundings. Natural camouflage not only enables an animal to escape detection by its enemies; it causes the flesh-eater to be less avoided by the animals it preys on.

Some animals are gaudily coloured, yet they are camouflaged nonetheless. The checkered sunfleck and leaf shadow pattern of the leopard, ocelot, jaguar, and giraffe,

## Introduction

though contrasting and conspicuous when you view it in a zoological garden, fades to obscurity in the bush. In Kenya the author saw a leopard take its stand in a bright sunlit opening against a background of bush; but a white hunter, a sportsman, and his gunbearer could not see the animal at seventy-five feet although they gazed at the exact spot where it stood for fully fifteen minutes.

Beasts of the open plains—such as lions, kangaroos, hares and the like—are noted for their lack of markings, but they still illustrate the fundamental principle of animal camouflage. The under parts of these animals are usually white, or lighter than the colour of the back. The brightest light comes from above and lightens the back, but throws the under parts in shadow so that both upper and lower parts look alike; the outline of the animal is thus flattened and blotted out in certain lights if the animal is motionless.

The camouflage pattern of an animal's coat is not always fixed. In regions where seasons bring drastic changes in temperature and in the colour of the surroundings, some animals not only vary the thickness of their coat, but change its colour as a concealing factor. The ermine and varying hare, for example, have brown fur in summer, which makes it difficult to see them on the forest floor; in winter they are equally inconspicuous against a snow-covered background, for now their coats have been changed to white.

These temporary white winter coats of northern animals should not be confused with albinism. Albinism is a sign of weakness, often accompanied by pink eyes and poor eyesight, whereas the change in the ermine and the varying hare is a normal, regular happening.

Almost anything that can be eaten serves as food for some kind of animal, and each

creature is specialized more or less to one type of diet. The cattle are grass-eaters, the deer are leaf-eaters, the beavers eat the bark of trees. The wild cats live mainly on flesh; there are bats that actually drain the nectar of flowers; some animals depend on a diet of insects or shellfish, or fruits, nuts, and seeds.

To feed on these diets, hard or soft, mammals often have special kinds of teeth. In general, a mammal's teeth are not all the same, the way they are in the lower animals with backbones. In one mammal like the tiger, we find large canine teeth that seize and rend the flesh of their prey, and cheek teeth adapted for biting; some have heavy molars that help in grinding, and other types of teeth.

The lower animals, like the shark, will grow a new tooth to take the place of an old one, and can go on doing this indefinitely. Not so the mammals—they have only two sets of teeth: the "milk teeth" and the "permanent teeth." They seldom have more than forty-four teeth, generally fewer. The monkeys of the Old World, for example, have thirty-two, the same number as man.

So far as teeth go, most of us have reason to envy the mammals; theirs will last them through life. Some mammals, like the beaver and other rodents—animals that gnaw their food—have long front teeth whose growth never ceases. The teeth of the horse and many other animals that grind their food continue to grow until late in life.

Animals that feed on tough, rough vegetation have sturdier teeth than those that eat soft, pulpy food. Insect-eaters like the anteater and the pangolin have no teeth whatever—instead, they have a long, extendible tongue to lick up their victims, which they swallow whole. Many whales are toothless, too; their mouths are provided with baleen, an efficient strainer that

permits them to separate from the water the minute sea life with which they maintain their huge bodies.

Whatever the element may be—land, water, or air—each animal has its advantages and disadvantages. On dry land a horse must not only support its own weight, but also generate the power necessary to drive itself along. On the other hand, the body of a whale is supported by the buoyancy of the sea; all its exertions can be centred on moving itself, but it must make a greater effort to force its way through water than would be the case in air. Some birds, like the albatross, can soar for an hour without flapping a wing; but such a bird must have huge wing muscles to hold it suspended in the air.

An animal's power to move is centred in its limbs or other extremities. The wings of a bird support and carry it through the air. The tail of the fishes and the flukes of a whale are propellers that push these animals through the water—but the chief driving force here consists of the undulations of the body itself. Land mammals, of course, travel by means of their legs.

Every living thing impresses us as a miracle of adaptation, once we look at it closely. Take the lowly housefly, for example. It has, on the ends of its feet, sucking disks that enable it to stay on a ceiling and walk upside down. The feet of the mammals are no less interesting. Animals that climb rocky mountain slopes have rubber-like pads on their feet as a safety device. The chamois, one of nature's ablest mountaineers, is shod with a pliable, horny hoof encasing a rubbery sole—a combination that will not only hold on slippery rocks but acts as a shock-absorber as well. A camel that travels over the shifting sands would quickly tire were its feet not equipped with a broad pad that

spreads when it is pressed on the ground, giving added support.

With the exception of leaping animals, most land-bound mammals move diagonally forward—the right front leg and the left hind leg move forward together, alternating with the left front leg and hind right leg. This is also true of ourselves. As we put our right leg forward, our left arm moves with it; a similar action of our left foot and right arm follows. With this diagonal movement of the limbs the body twists and weaves forward with an even continuity of movement.

There is no doubt that this pendulum motion of the limbs and body is the most efficient method for travel on land, yet not all four-footed animals progress in this manner. A very few amble or pace. In these the fore and hind limbs on one side move forward at the same time, first on one side then on the other.

Animals that pace have their body slung high on their legs but they are not restricted to any particular kind of dwelling place. The camel is the most popular example of a pacer, but the llama, alpaca, and their wild camel-like relatives of the Andes are also pacers. The giraffe of the African veldt is a pacer, as is the okapi of the Congo forests. The hyena paces; some horses inherit a like tendency to pace. This is not artificial, although it is developed by trainers.

The tail plays an important part in helping many animals to move about. Squirrels have need of a bushy tail to maintain their balance in the treetops and to guide their descent in their flying leaps. Many jumping animals have a long tail and use it as a rudder when sailing through the air. The great kangaroo makes long leaps sometimes covering about thirty feet and is given an extra boost by its powerful tail. Passing from the great to the small, we find that all the jumping mice have

## Introduction

exceptionally long tails to steer them through the air. Most monkeys have a long tail as a balancing organ; the South American monkey often can use it as a fifth hand.

Of course many mammals with only the scantiest trace of a tail do very nicely all the same. The African antelope, the impala, covers up to thirty-five feet in a jump without any assistance from its short tail. An American jackrabbit has been known to clear a fence seven feet high.

When we come to the mammals, record speeds, although good, cannot rival that of the birds. The fastest four-footed animal on land is the cheetah, with a stop-watch record of 70 miles per hour. It probably has an even greater maximum speed.

The Mongolian antelope and the American pronghorn can keep ahead of an automobile with the speedometer registering 60. The fastest speed ever recorded for a race horse is 48 miles per hour. Some hares come close to this—they can travel at a speed of 45 miles, which is about the same as the top speed for a big kangaroo.

In general, four legs are better than two; the top speed at which a man can run is only 22.8 miles per hour for 100 yards, while a greyhound can streak along at 40 miles and still be left behind by a hare. The slowest mammal is the sloth, which on the ground cannot move faster than half a mile per hour.

In speed, the mammals have gone far beyond their reptile forebears. A man can easily escape from most snakes found in the United States and Europe. The African mamba, which grows to a length of 12 feet, is one of the fastest snakes on earth, with an estimated speed of 10 miles an hour.

For most mammals, the bright sunlight hours around midday and the darkest hours of the night are a time for resting and sleeping. Some, like the tree squirrels and

their kind, may be abroad during the warm part of the day, but most prefer to stay in their nests and dens, or hide in the underbrush.

It is when the shadows begin to lengthen that all nature really comes to life, and the woods and countryside hum with activity. In the twilight, most mammals eat their big meal of the day. Grazing and browsing animals, like the hippopotamus and the antelope, come out of their places of concealment and feed steadily in the cool of the evening and well on into the night. On the wing at sunset, the bats have eaten their fill of fruit and insects and returned to their roosts before midnight; they may go out hunting again in the small hours of the morning.

There are a few strictly night prowlers, like the wolves, tigers, and other flesh-eaters, that will continue their search for prey all night if their hunger has not been appeased. Many rodents are not only active by night, but all through the day, too. They must eat constantly for they are energetic little creatures and their bodies quickly burn up all the food they can provide themselves with. By and large, though, most animals are active at dusk.

An animal is born with an inherited sense that it obeys without question. It comes into the world with the ability to act and protect itself according to its immediate needs—without instruction or learning gained from experience. This is what we mean by animal instinct.

Instinct is generous and motherly; it gathers all life under its protecting shelter. It covers a wide field of animal behaviour, from the simple reaction which directs a creature to move away from excessive cold or heat, to the more rapid reflex actions brought about by contact. It includes higher complex subconscious impulses such as love and hate, those that

govern parental care, as well as the urge to migrate at certain seasons of the year.

Instinct works in many strange and mysterious ways. It tells a bird when and where to build its nest—but the bird is quite unaware why it builds the nest. Very young songbirds in a nest show no fear of a stranger and make no attempt to escape—not that they could if they tried. These same babies, fully feathered and ready to leave the nest, have somehow acquired the ability to fear and the impulse to flee from danger. Instinct leads the newborn mammal baby to its mother's breast to nurse and the newly hatched duckling to water. Contrariwise, it keeps the baby chick on dry land.

Instinct keeps an animal in constant readiness to act instantly and to meet any emergency without hesitation. Confronted by the sudden appearance of a mortal enemy, an animal does not make a haphazard dash for safety, but follows a definite method of escape, making all possible use of every advantage. The animal itself may be totally ignorant of why it follows such a course and is unable to foresee the result of its actions.

Animals can and do acquire knowledge through learning during a lifetime. A successful life for a mammal is largely dependent on its ability to learn.

Tuition begins in infancy, when a mammal is to no small extent at the mercy of surrounding conditions. It acquires a working intelligence through watching the activities outside itself—their cause and effect.

The comparatively long period of childhood in a mammal, when the brain is pliable, permits a greater development along educational lines than we find in other animals. Under parental tuition the growing young are able to gain considerable useful knowledge that will benefit

them in later life. The mother takes her young on excursions into the outside world, where they get first-hand realistic knowledge in the field. Skill comes through practice and by following the example set by the experienced parent.

In the care they give their young, the mammals surpass all other forms of life. It is true that some insects, fishes, reptiles, and amphibians show instinctive concern for the welfare of their eggs and babies, but with most it is a matter of chance whether or not the young survive at all. The birds, on the other hand, are famous for the attention they bestow on their offspring; many nestlings are fortunate enough to have the companionship and protection of both mother and father. Still, the mammals as a group show more solicitude than most for the well-being of their babies.

The feelings of man and beast are perhaps closest during courtship. Both have the same natural instinct to have young and perpetuate their race; both experience passionate feelings of affection for their mate and of hatred for anyone who frustrates their desires.

Most wild animals live a very *orderly* life. There is a time for courtship and a time to be born, just as there is a time to eat, sleep, and engage in other activities. As a rule, life is so timed that the young are born in the spring of the year, when food is plentiful and there is a whole summer to grow and prepare for the winter.

Wild animals are exceedingly restless during the season of courtship; in fact, at this time their behaviour is unpredictable. Some males do not eat for weeks on end but, once the mating season is over, they all settle down to a regular, orderly life. All strife and enmity is forgotten. Warriors that battled in deadly earnest over some comely female, once more become inseparable companions.

## Introduction

Unlike the birds, few mammals enjoy the care of both parents. Usually only the mother lives in close association with the young during the early stages. This is understandable since she alone can supply milk. Male sea cows, however, show a marked interest in the young from the very first and will carry the newborn calf around while the mother feeds herself. Males among the herd animals are more typical—they show not the slightest concern for the young.

It is among the carnivores—the flesh-eaters—that we find the father taking a truly dutiful place in family affairs. He is the provider and brings food to the female while she is nursing her cubs or puppies. Later he provides food for the young as well, but he is not permitted in the nursery while they are very little.

The necessity of being born and cared for in infancy is often at the root of social behaviour in the animal kingdom. Large families carry the social spirit forward toward community life.

There are, of course, many insects and fishes that never know their parents and yet live together in well-established groups. On the other hand, hyenas and some other animals are rank individualists and cannot tolerate the company of their fellows. Still, we may say that animals that live together in herds, schools, or flocks are in a general sense born to it, and feel ill at ease if separated. When forcibly broken up, a school of fishes, a flock of birds, or a herd of animals will probably join company again as soon as possible.

Many creatures have a genuine desire to live near others of their kind and some develop a personal attachment for a particular individual, sometimes of another species; the friendship of man and his pets is a common example. We can often discern, too, an advantage gained by animals that

live together. A musk ox is safe from attack by wolves only so long as it stays with the herd. When danger threatens, a herd of musk oxen form a circle; their horns present a bristling armour, sufficient protection against a whole pack of starving wolves. In the animal kingdom a sick, old, or very young creature cannot survive on its own for any length of time as a rule.

Animals will also perform a common labour to their general advantage. Beavers, working together, can build a great dam, a feat that a single animal would not be capable of.

Social rank is recognized in many groups of animals. Among herd animals there is always a group leader. Usually this is an experienced cow, probably the grandmother of most of the herd. Then there is the master—a herd bull, pompous and self-assured, yet having little authority except at the mating season. Each member of a herd has its place and must wait its turn on the trail. In a pack of wolves, too, one is the leader, a position held by right of might. Others follow in a graduated scale of seniority and valour.

In a general sense the life span of a species varies with size. The larger it is, the longer it may be expected to live. This is not meant to imply that the biggest animal always lives the longest. The great blue whale is the largest animal that ever appeared on the earth, but there are smaller animals that outlive it. Still, by and large, the rule holds true.

With actual records of over fifty years and possible estimates of up to seventy years, the Asiatic elephant seems to hold the record as the longest-lived of the wild mammals. Among the few other species that may reach or exceed a life of thirty years are the baboon, lion, bear, horse, donkey, rhinoceros, tapir, hippopotamus, and the giraffe, as well as the larger whales.

For their size, the apes, monkeys, and

lemurs are the longest-lived of the mammals. The great apes are not fully grown until they are between fifteen and eighteen years of age, and it is not unreasonable to assume that they might live almost as long as man. All we know from individuals in captivity is that the chimpanzee and orangutan may live to be about twenty-five years of age.

Most cats are in the ten-to-twenty-five-year class. The wild dogs rarely live beyond twenty years, and most cattle, sheep, deer, and antelope—animals that chew the cud—have an average maximum life expectancy of about twenty-five years. Squirrels cannot be expected to live more than fifteen years, and rats and mice not more than six or seven. Shrews and field mice may live about a year or eighteen months, but few ever die of old age.

The length of life in a large majority of mammals has a controlling factor in their teeth. Teeth take a definite time to grow and a less definite, but still limited, time to wear away. When the teeth of a mammal become useless for procuring food, the animal must die.

The loss of its teeth, however, is not quite so drastic an end to the animal as it might seem. Teeth are constructed to last the average life span of a species. Normally the animal would die of old age about the time, or even before, the teeth became useless. The long-lived animals that feed on tough, fibrous grass—the horses, for example—have high-crowned teeth that will take over thirty years to wear down completely.

There is no way known by which we can determine the exact age of a wild mammal. But we can gather a general idea from the wear of its teeth—provided we know the average life-span of the species.

There are many living things that look alike but really are different; some that appear to be quite different are in fact close

kin. Many animals bear the same popular name; for example, "elk" is a term which for centuries in Europe has been applied to the moose, and in America to what a European would consider a red deer. Clearly, we cannot possibly discuss animals intelligently without first arranging them in a systematic scheme.

The modern method of classification, or taxonomy, is a natural one based on the grouping together of related forms of living things; we judge the closeness of their relationship by the degree of similarity we observe in their form and structure. Thus all living things may be sorted into two main groups—plants and animals—called kingdoms.

The kingdom is composed of a number of major divisions, each known as a phylum. Every phylum in turn is split up into classes. Each class may be divided into orders; each order into families; each family into genera (plural of genus); and each genus into species. Sometimes it becomes necessary to form special intermediate groups such as the subphylum, the superclass and the subclass, the superorder and suborder, etc. The scientific name of a creature consists of the names of the genus and species to which it belongs; these are printed in *italic* type.

Let us, for example, trace the wolf through the successive groups. It will be a long journey, but we shall get a good idea of the meaning of the terms we have just been talking about. We place the wolf in kingdom Animalia (the animal kingdom), which includes all living things except the plants; phylum Chordata (all animals with a backbone, or vertebral column, and never more than two pairs of limbs), including the mammals, reptiles, amphibians, and fishes; class Mammalia, the mammals (in which all members possess some hair and suckle their young).

At this point we have only reached the

## Introduction

mammals. We still have quite a way to go to classify the wolf completely. So, faring onward, we place it in subclass Theria (all living mammals that bring forth their young alive, excluding the egg-laying mammals); order Carnivora (mammals that have sharp teeth for a flesh diet, and toes armed with claws or nails); family Canidae (doglike runners with a long head, unsheathed claws, and long, strong canine teeth); genus *Canis* (typical doglike animals, but excluding the foxes and their relatives); species *lupus* (true wolves).

Now, leaving aside the explanations, let's take the same trip again, this time on an express that will permit us to get a quick picture of the position of a particular kind of wolf in the scientific scheme of things. It is placed in kingdom Animalia, phylum

Chordata, class Mammalia, subclass Theria, order Carnivora, family Canidae, genus *Canis*, species *lupus*, subspecies *nubilus*.

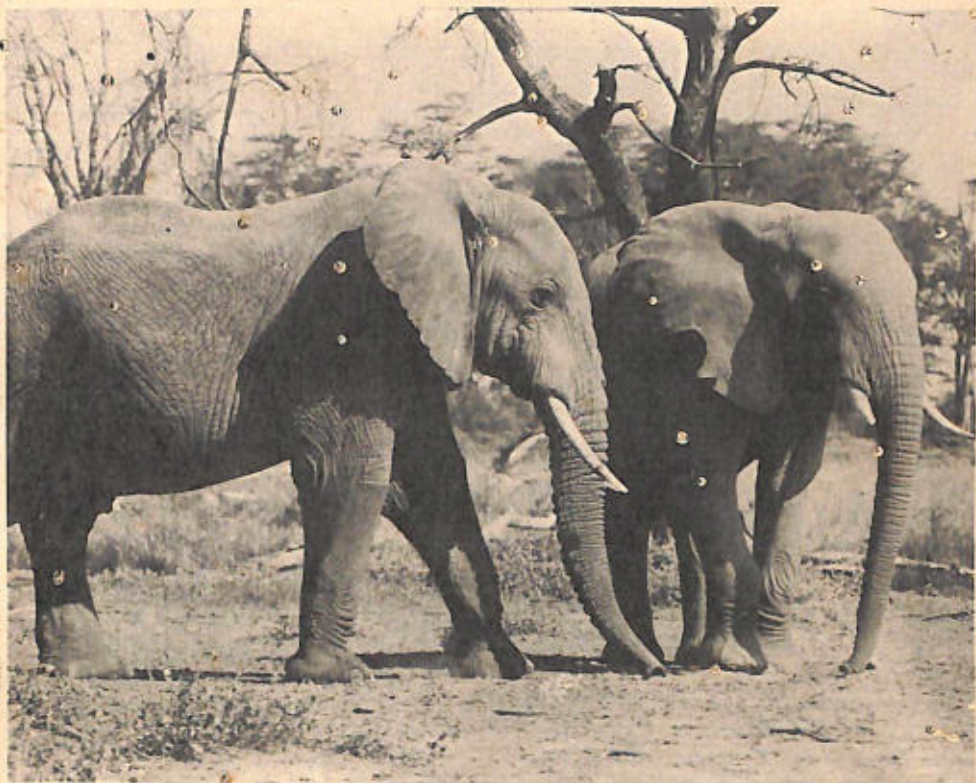
*Canis lupus nubilus* Say, one of the several forms of true wolves, is known to the layman as the buffalo wolf. In scientific literature the name of the person who first described the animal is given following the scientific name—in this instance it was the American zoologist Thomas Say.

In the world today we have eighteen orders of living mammals, 118 families, a minimum of 932 genera, and roughly 3,500 species. The number of species and subspecies listed in 1936 was placed at a total of 14,464, and in round figures 15,000 will serve for the present day. And strange and fascinating creatures they are.

Manatees



**Volume 2: Large Mammals**



**African Elephants**

## Whales, Dolphins and Porpoises

The whale is not only the biggest creature alive today—it is the biggest that ever lived. The giant of all whales, the blue or sulphur-bottom whale, may reach a length of one hundred feet and weigh over one hundred tons. That is larger than the dinosaurs. The biggest dinosaur weighed a mere fifty tons, according to careful estimates.

There are much smaller whales, of course. Moreover, some of the whales' relatives, the dolphins and the porpoises, are only six feet long. A number of these creatures are of such a size and shape that scientists have never quite decided whether they are whales, dolphins, or porpoises.

Some kinds of dolphins and porpoises are commonly confused. The most marked difference between the two is that the dolphin has a snout—a well-defined beak—and the porpoise hasn't. As you might expect in nature, there are also a few intermediate forms. But all belong in the same order of fishlike mammals (Cetacea, from the Greek word for "whale") that spend their entire lives in the water and are completely independent of dry land.

This was not a poor move on their part. The seas, after all, provide an immense field for the development of living things. Sea water covers more than three-fifths of the earth's surface, and the room available for marine life is actually three hundred times greater than that for life on land. Water provides support for an animal's body, permitting it to grow larger than it could on land.

While the whales, dolphins, and porpoises look like fishes, the resemblance is only superficial. The cetaceans are just as

much mammals as are lions or deer. Like other mammals, they are warm-blooded. They breathe air. They bring forth their young alive, and they suckle them. Fishes, on the contrary, are cold-blooded. They get their oxygen from the water by way of their gills. They do not possess mammary glands, and usually their young develop from eggs.

You may never get a chance to observe a whale close up, but, if you did, you would see that its round body is streamlined, tapering to a broad, flat tail. Interestingly enough, the tail is not vertical, like a fish's, but horizontal. A notch in the centre divides it into a pair of flukes. These have no bony support, like a fish's tail, but are strengthened by cartilage. Because its tail is horizontal, the cetacean can move forward in an even, undulating manner at the surface of the water. Also, it can come up fast for air.

A whale actually has limbs, not fins, toward the front of its body. These limbs are paddle-like in form and we call them flippers. They aid the animal to balance and steer itself. It relies on its powerful tail for moving about. There are no hind limbs, for these were lost long ago, leaving only internal traces behind. There is a dorsal or back fin as a rule, well to the rear.

A whale's skin is hairless and smooth—qualities that make for speedy progress through the water. It may or may not have a few bristles on its snout, relics of its hairy ancestry. Below the skin it has a thick layer of fatty tissue. This is the blubber. It serves to protect the warm-blooded whale against the extremes of temperature and pressure it encounters

in the depths of the oceans, and prevents the loss of body fluids. The eyes are small and better adapted to seeing under water than above. A special substance produced by the tear glands protects the eyes against the irritation of salt water.

Although the whale lacks external ears, it has a hearing canal that leads to the internal ear from a tiny opening in the skin, and we believe the whale hears sounds in the water quite well. So far as we know, it has no sense of smell.

You may have heard there are many different kinds of whales, but you will probably be surprised to learn that they fall into two main groups: the toothed whales and the whalebone whales. The toothed whales have in the lower jaw, or in both jaws, simple, cone-shaped teeth. These serve to catch and hold the food—marine animals ranging from squids and fish to seals and other whales and occasionally birds. The food is swallowed whole. To this toothed group belong porpoises, dolphins, killer whales, and sperm whales.

The second group, the whalebone whales, get their name from the whalebone, or baleen, which they have in place of teeth. Whalebone is not bone, as many people believe; it is a horny substance. Hundreds of long, thin, tapering whalebone blades hang in two rows along the roof of the mouth, one row on each side. These blades completely fill the space on either side when the mouth is open.

The whalebone whale feeds on plankton—tiny plants and animals as well as jellyfishes and other weak swimmers that live near the surface of the sea. When it opens its huge mouth, it takes in great numbers of them, water and all. Then it closes its jaws, catching the plankton inside the whalebone blades, which automatically fold backward as the mouth is closed. The inner edge of each blade is

frayed into loose bristles. These fringes of the closely placed blades make an effective strainer to trap the plankton when the whale's muscular tongue forces the water out.

Whalebone isn't important only to whales; man has put it to a variety of uses for a long time. It boomed in value in the days when the crinoline was in style, and was employed to make bustles. We still occasionally use it as a stiffener in collars, corsets, whips, fans, and similar objects. Good kinds of whalebone are obtained from the bowhead whale and the southern right whale in particular. The whalebone is first softened by boiling, and it is often dyed black or bleached white.

Large whales consume about a ton of food a day during the summer, but the daily ration is much less in the winter when food is scarcer. Most whales feed on or near the surface of the sea; some of the larger toothed whales descend to great depths in pursuit of food. The sperm whale may "sound" or go down and stay under for fifteen or twenty minutes and on occasion nearly an hour.

Such feats of deep-sea diving require special equipment, and the whale possesses it. Near the crown of its head the whale has one nostril or a pair of them, depending on the species. These are the famous blowholes, which connect directly to the lungs. Valves in the blowholes provide a means of closing the nostrils against the entry of water. You will often hear people say that a whale takes water into its mouth and spouts it out through the blowhole. This is untrue. A whale cannot breathe through its mouth.

There is no fixed breeding season for most whales. A female gives birth to a single calf, as the baby is called, at a time; twins are rare. The young cetacean is bigger than any other mammal infant: sometimes it is twenty feet long.

## Sperm Whale

From the moment of its birth, the calf can swim—as indeed it must—and is able to keep up with the school it belongs to. The mother nurses her baby for about six months. She has two teats toward the rear of her under side, and the milk collects in reservoirs. When the calf is ready to nurse, a muscle goes into action, emptying the milk rapidly into the baby's mouth.

The average life span of the large whales is remarkably short. Few of the baleen or whalebone whales live more than twenty years. Highly-organised commercial hunting for whales contributes in no small way to their short life span.

Together with their oil, the flesh and, sometimes, growths of ambergris make certain whales extremely valuable.

Ambergris, pound for pound, is the most valuable product of the whale. An opaque waxy substance, it has an odour suggesting musk, which is pleasing to most people. Ambergris has a lowly origin, like the pearl. It is a secretion produced in the alimentary canal of a sick sperm whale. The sperm whale is fond of feeding on squid. It is believed that squid beaks frequently become imbedded in the walls of the whale's alimentary canal and set up an irritation, which causes the ambergris to form.

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## The Toothed Whales

Although whales and porpoises look alike, they are vastly different in their size and habits and the way they behave. Most of the larger whales are mild, inoffensive creatures. One member of this group, however—the killer whale—is probably the most savage and ferocious of all wild animals. Schools of killer whales hunt on the high seas like wolves in a pack, ready to gang up on a defenceless creature and tear it to ribbons.

The group name of these animals (suborder Odontoceti) means "toothed whales" and the adult whales have teeth that are usually numerous and cone-shaped. They feed on squids, octopuses, and fish. The blowhole is a single opening. The males are larger than the females.

Although dolphins are sometimes called porpoises, and porpoises are sometimes called dolphins, as suggested earlier we apply the name "dolphin" to those cetaceans whose muzzle is drawn out in the shape of a beak, while the porpoise has a rounded muzzle. There are some-in-

between forms which could be classed under either name.

**The Sperm Whale, or Cachalot,** *Physeter*, to whose clan Moby Dick belonged, is perhaps the most famous of all whales. A sixty-foot monster, it ranges all the seas and migrates north and south with the seasons. Although normally peace-loving, the animal will, when wounded, crush a whaleboat as if it were matchwood. Its mighty, blunt head, used as a battering ram, has staved in the hull of more than one wooden whaling ship.

The sperm whale's head makes up one-third of the animal's enormous length. The head contains a huge reservoir filled with the whitish oily substance known as spermaceti. We believe that this oil pocket acts as a cushion that somehow protects some of the animal's vital organs from the excessive pressure it must sustain when it descends to great depths. The sperm whale will go as far down as 3,200 feet, where the pressure is 1,400 pounds to the square

## Sperm Whale

inch, and will stay there an hour or more.

The sperm whale feeds on giant squid and cuttlefish, which it hunts on the ocean floor. It consumes about a ton a day. On one occasion a ten-foot shark was found in the stomach of a sperm whale, and we can safely assume it could swallow a human being. Normally its lower jaw is armed with about two dozen teeth in each side for grasping its elusive prey (once in a while we find a sperm whale with teeth in the upper jaw). The sperm whale is the one that produces ambergris when its intestine is irritated.

A full-grown bull sperm whale is a massive creature. A forty-three-foot specimen weighed 86,000 pounds, the liver 925 pounds, and the heart 277 pounds. Some males grow to eighty feet or longer. There is a marked difference in the size of the sexes, the cow often being scarcely more than half as big as a large bull.

Sperm whales appear to be polygamous, the bull whale keeping a harem. There is no fixed breeding season. The baby whale is not born until a year after the mating. Newborn, it will measure about fourteen feet in length. Its mother nurses it for the first six months. By the

time it is fully weaned it may reach a length of twenty feet or more.

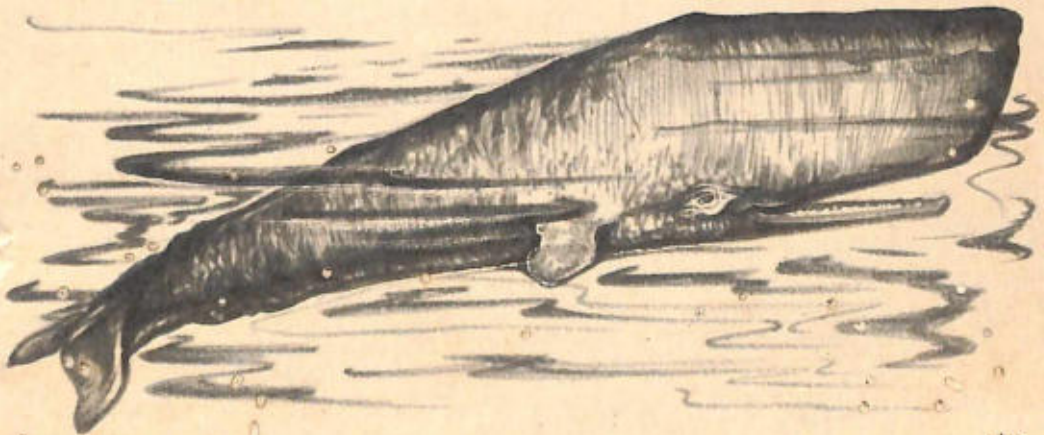
The sperm whale is dark in colour, sometimes black. It may produce an albino offspring, but this is a great rarity. Apparently not since the legendary Moby Dick in Herman Melville's classic book on whaling has one been chronicled. Or, rather, such seemed to be the case until the winter of 1951-1952.

In that season the Norwegian whaling cruise took some 3,066 sperm whales in the Antarctic. Among the catch was a milky-white sperm whale, killed off the coast of Peru. Except for a slight bluish colouring about its flukes, the animal was completely white. This was the first albino ever caught, to the recollection of the whalers on the fleet, some of whom were veterans with more than thirty years' experience hunting the great ocean mammals.

A rapid swimmer, the sperm whale cruises along at about four knots but it can triple this speed if it has to. It is the commonest large whale on the high seas. Formerly schools or "pods" of one thousand individuals were recorded on the migration routes. However, groups of

### Sperm Whale

This, the largest toothed whale, spends much of its life in tropical waters.



## Pygmy Sperm Whale

two or three are all one can hope to see today on a transatlantic voyage.

Much like the sperm whale in ways and appearance is its little cousin, the **Pygmy Sperm Whale**, *Kogia*. The pygmy reaches a length of about thirteen feet and weighs about nine hundred pounds. It is blackish in colour, has a dorsal fin, and feeds on squid and cuttlefish, which it hunts at great depths on the ocean floor.

Although it has been reported in many different waters, the pygmy whale is not very common anywhere. With the big sperm whale, it makes up a distinct family (Physeteridae).

## Beaked Whales

The "toothless" whale of Le Havre was one of the first of the beaked whales to gain recognition by science. It was captured at Le Havre in August, 1828, and attracted considerable popular interest at that time. It lived for two days out of water and was offered soaked bread to eat.

Reports tell us that this creature emitted a deep sound like the lowing of a cow.

There are ten different kinds of beaked whales, but none of them is over thirty feet in length. They can be recognized by the long, rounded snout (or "beak") and the pair of converging furrows or "pleats" on the throat. These creatures, like other beaked whales, feed on squid and cuttlefish, and are native to all the warmer seas.

So far as we know these whales are the survivors of a once numerous race of cetaceans. (With the other beaked whales, they form the family Ziphiidae.) They have only one or two pairs of functional teeth at the tip of the lower jaw. (Probably these were worn down in the whale captured at Le Havre, and that is why it was called "toothless.") Strangely, there are often a number of small teeth in both

jaws hidden in the gums and not attached to either of the jaws.

Another beaked whale worthy of mention here is the **Goose-beaked Whale**, *Ziphius*, often called **Cuvier's Whale** because Cuvier was the first to recognize it (he named it in 1823). This animal's habits are much like those of the cowfish but it is a somewhat larger whale and travels in schools instead of singly or in pairs.

Schools of these beaked nomads of the deep cruise in all open oceans. A group will roll along the surface for a while, in perfect unison; then, as if at the command of a leader, the whole school goes down simultaneously in a deep dive, and may stay under thirty minutes or more.

We have observed that among land animals there is competition among males for possession of the female. The situation is no different among whales, and the bulls fight furious battles during the mating season. In their frenzy they may even attack an innocent cow or calf that gets in their way.

The largest of the beaked whales, **Baird's Whale**, *Berardius*, a creature that may grow close to thirty feet in length, is at home in the Pacific Ocean. It has two pairs of extraordinary teeth in the lower jaw—they can be depressed or elevated at will, and are particularly serviceable when the animal is defending itself or attacking its prey. The teeth are embedded in a cartilaginous sac in the sockets of the lower jaw and are moved up or down by a muscular action. The animal has been described as bellowing like a bull.

This brings us to the **Bottle-nosed Whale**, or **Bottlehead**, *Hyperoodon*, the most commercially valuable of the beaked whales. It is one of the few cetaceans that show a marked difference between the sexes, other than in point of size.



### Bottle-nosed Whale

**A beautifully streamlined whale, once heavily hunted for its oil, that is found mainly in the North Atlantic. It feeds on cuttlefish.**

A male bottle-nosed whale has a head that very roughly suggests a bottle. A very high forehead rises abruptly behind the rather short beak. This raised crown encases a reservoir of high-grade oil or spermaceti. The male also has a distinctive white patch on the forehead and a white dorsal fin. The plainer female displays none of these characteristics.

Bottle-nosed whales spend the summer in the Arctic seas. Later they migrate south in the Atlantic to the latitudes of the Mediterranean Sea. Although some herds are large, occasionally groups of only three or four whales are reported. The animals mate in April or May, and it is a full year later that the single calf is born.

Baby Bottle-nose is a relatively large black creature, a mere ten feet in length. As it gets older its colour changes; yellowish spots begin to appear on its skin. These gradually increase in size, until, in old age, the whale may be completely white or yellowish white. A full-grown

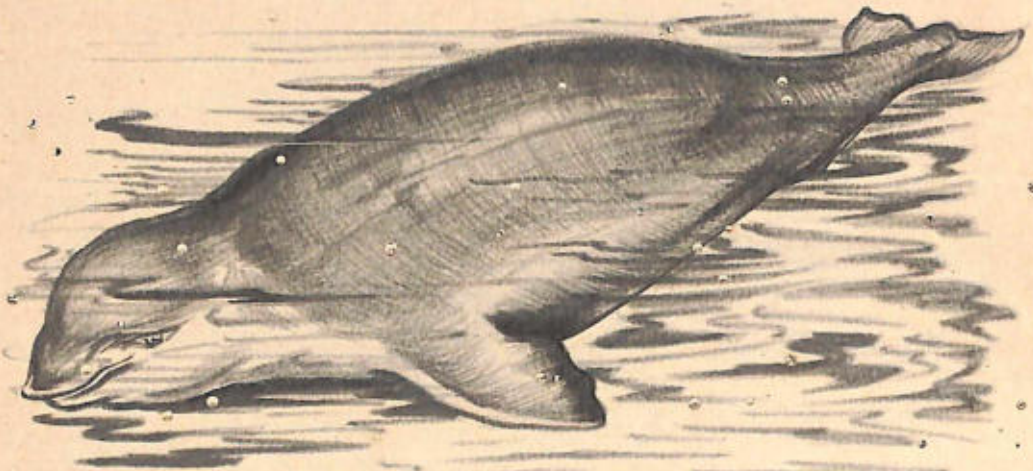
bottle-nose will yield about one ton of oil. The male animal may be some thirty feet long, the female about six feet shorter.

## White Whales and Narwhals

**The Beluga or White Whale, *Delphinapterus***, has another name that you might hardly expect to find applied to a whale. This animal is sometimes called the "sea canary" because it actually makes trilling sounds when it is under the water!

At home in the coastal waters of the Arctic and sub-Arctic seas, the white whale also travels up rivers far above the pull of the tide. It has been observed a number of times in the lower St. Lawrence River, and can be readily recognized by its white skin and the absence of a dorsal fin. Full-grown males average twelve or fourteen feet in length. These animals are fast in the water and can

## Narwhal



### White Whale

**A relatively small whale, very gregarious in habit, which was overhunted for its high-quality oil and is now considerably reduced in number.**

speed up to six miles an hour. They feed on squid and prawns and will take salmon when the fish enter the rivers in the spring.

The white whale is fond of company and gathers together in herds or schools numbering from a few individuals to probably a thousand. In 1898 an enormous herd was reported trapped in a "hole" in the ice 150 yards long by 50 yards wide at Point Barrow, Alaska. The water here was thirty fathoms in depth, and the animals were too far from open water to attempt to swim under the ice and escape.

When the incident was investigated, 150 whales killed by Eskimos were found lying on the ice, half as many more were tied to the edge of the ice, and hundreds more were still alive.

**The Narwhal**, *Monodon*, a native of the waters of the Arctic and North Atlantic, is especially noteworthy for the great tusk of ivory that projects from its upper jaw. The animal itself may reach a length of twenty feet; the tusk may be as long as

nine feet.

Usually only the male sports the tusk. So far as we can determine, the narwhal does not use this projection as a weapon of attack, though perhaps it serves that purpose in battles between males for the possession of cows.

Like many other water-dwelling mammals, the narwhal keeps places in the ice open for obtaining air. In these holes it has been observed in company with its cousin the white whale. The narwhal is not a fast swimmer. But under the water it is quick enough to catch the creatures it feeds on—cuttlefish, turbot, cod, salmon, skate, halibut, flounder, sea scorpions, shrimp, and other marine animal life. It may crush fish between its jaws but it usually swallows them whole.

Just as the narwhal surfaces, it emits a shrill whistle. This may be the air being expelled from its lungs through the blow-hole. Often a deep roar and a low-pitched bellow are heard from a narwhal—it could be the female calling her calf.

When full grown, the narwhal is greyish

in colour with numerous darker mottlings along its sides and back. This is supposed to account for its name; it meant "corpse whale" in Old Norse. Eskimos eat the narwhal's flesh and burn the oil, which is of fine quality, in their moss lamps. They make the intestines into lines or clothing.

Sometimes a narwhal is found with two tusks, but normally there is only one. It is actually the animal's left upper canine (the creature's scientific name, *Monodon*, means "one tooth"), and projects from the left side of the upper jaw. Because of the tusk, some seamen used to call the narwhal the "sea unicorn."

Very likely, narwhal tusks, picked up by Scandinavian fishermen long ago, helped develop our picture of the fabulous unicorn. Even as late as Shakespeare's day many people took that beast of fable for a real animal.

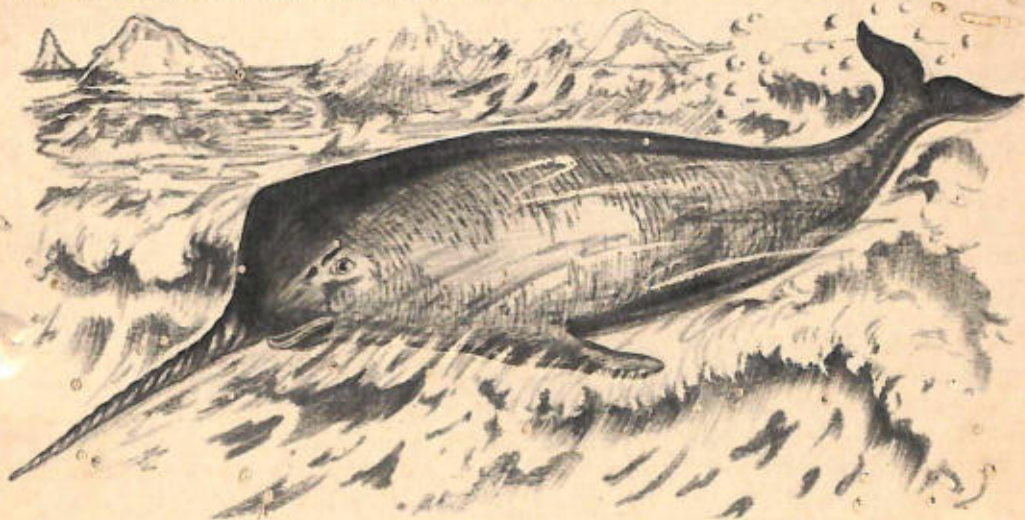
The starting point of modern zoology is a book called *Historia Animalium*, or "Story of Animals," by Konrad von

Gesner (1516-1565). Although this old Swiss naturalist made a serious attempt to sift facts from fiction, he could not altogether free himself of the fancies of his time. Like the Roman naturalist Pliny, fifteen hundred years before him, Gesner described the unicorn as an actual member of the animal kingdom. In his illustration of this mythical beast, he figures it with a straight, spirally twisted horn in the middle of the forehead—a perfect example of a narwhal tusk—the body of a horse, cloven hoofs, the tail of a lion and the beard of a goat.

Although a narwhal tusk is an object of some value today, it was an exceedingly precious find in the past. The people of the Middle Ages, considering it the unicorn's horn, looked upon it with great awe. They thought it was capable of rendering all poisons harmless and of changing the deadliest draught into a wholesome beverage. The unicorn, they believed, had need of such a weapon because it lived in the desert among all kinds of loathsome

### Narwhal

**This is the only whale that possesses a tusk. The tusk is actually the upper left canine tooth which develops excessively and projects from the jaw.**



## Common Dolphin

beasts and poisonous reptiles whose look was contamination and whose touch was death. The tusk of the narwhal—the doughty weapon of the unicorn—they supposed had been torn from the animal's forehead despite its supernatural strength and superhuman intellect.

Actually, the unicorn legend goes back further than the Middle Ages—even further than Pliny. A unicorn is mentioned in the Bible several times. The Psalmist, for one, says: "But my horn shalt thou exalt like the horn of an unicorn: I shall be anointed with fresh oil" (Psalms 92:10). Later fables about the animal may have been confused with stories reaching Europe of the one-horned rhinoceros of India.

## Dolphins

Ever since ships went to sea it seems the appearance of dolphins coursing alongside a vessel's bows has been regarded by seamen as a good omen and a promise of fair weather and steady winds.

Most of the dolphins are harmless to man, and some are even friendly. One ranks among the fiercest creatures of the deep. This is the so-called killer whale.

Compared to their big relatives, the whales proper, the dolphins must be considered medium to small in size. Generally, as mentioned earlier, the snout is narrowed to a beak, and often there are numerous teeth in both jaws. We find the members of this family (Delphinidae) in all open seas. They often ascend large rivers, and some of them live in fresh water.

The dolphin, with its antics and friendliness, probably attracted the fascinated attention of the first men that sailed in boats. It has been a famous animal ever since, and is even associated with Scriptural events.

**The Common Dolphin**, *Delphinus*, one of the handsomest of its tribe, is found in all seas but is most plentiful in warm and temperate regions. It is the sportive, happy-looking creature usually seen from the decks of transatlantic steamers. In graceful and seemingly effortless leaps, the common dolphin breaks water as it overtakes and passes ships travelling at sixteen or eighteen knots. A speed of thirty knots has been reported for this well-named "Arrow of the Sea."

A slender creature, the common dolphin has a sharp-pointed beak, six inches long, set off from its forehead by a groove. There is an air of scholarliness about the animal; a black ring circles each eye, making the dolphin look as though it were wearing glasses. Its greenish-grey or brown flanks are marked with stripes of a darker shade.

This speedy swimmer is only about seven feet long and has a single blowhole. Like its larger relatives, it has a thick padding of blubber to keep it warm. It possesses numerous teeth, sometimes as many as one hundred in each jaw, and they interlock to form a perfect vice for catching and holding the fish the dolphin feeds on. A sociable animal, it communicates with its fellows by whistling.

From afar, the common dolphin might easily be mistaken for a whale; bigger dolphins are, as a matter of fact, often called whales. This attractive animal, however, is much too small to be worthwhile prey for professional whalers.

Like most of the other dolphins, the common species bears a single baby at a time. The infant is born about eleven or twelve months after mating time. It takes some thirty-five minutes for a baby dolphin to be born, but its actual entrance into the world is exceedingly fast.

Born in deep water, the baby must reach the surface almost instantly to

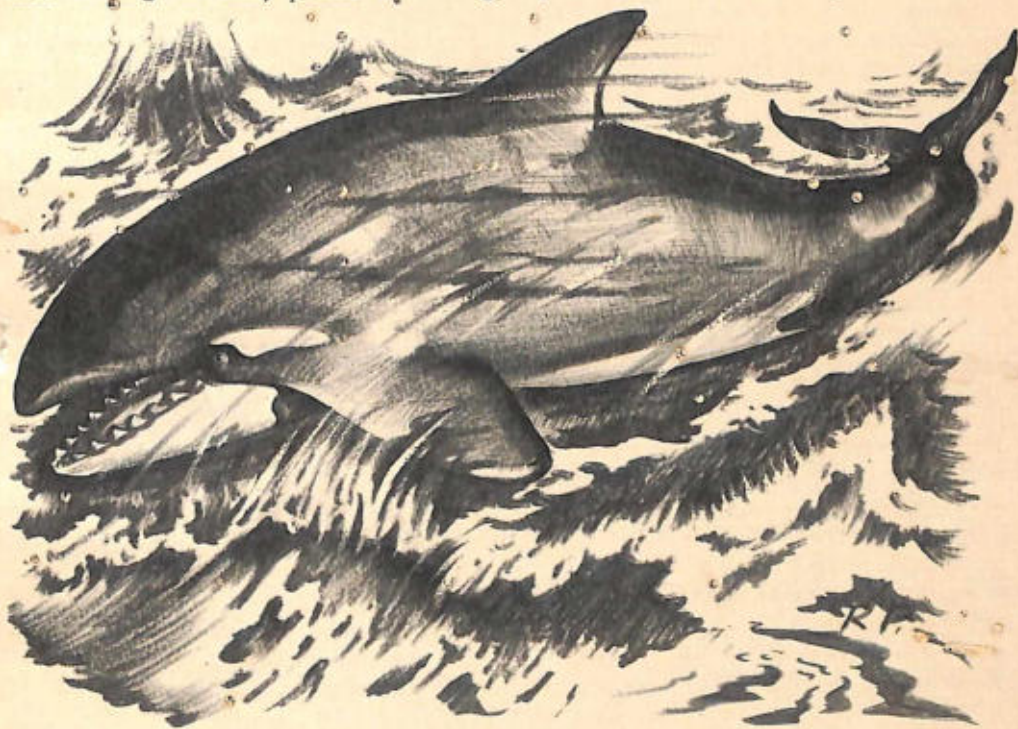
## Killer Whale

breathe. If it does not surface under its own power, then the mother dives under to assist in bringing the calf up.

Thirty minutes after birth the baby is ready for its first meal. It is nursed under water at intervals of about one hour at first. During the early period of nursing

water as the animal cruises along.

A huge, powerful beast, the killer whale may reach a length of thirty feet. The white patch above and to the rear of each eye (in the Atlantic species) and the snowy white of the under parts extending up on the sides are in sharp contrast with



### Killer Whale

**This dolphin has the reputation for being the most ferocious of all predators. These voracious hunters are found in nearly all seas.**

the baby dolphin comes up for air frequently. The milk is injected rather than sucked into its mouth.

**The Killer Whale, *Grampus (Orcinus)***, the most bloodthirsty of marine mammals, is actually a dolphin. Found in all seas including those of the Arctic and Antarctic, it is readily recognized by the tall black dorsal fin that cuts the surface of the

the jet-black colour of the animal. Its head is bluntly rounded; its frightful jaws are armed with forty stout teeth or more. There is no beak.

No animal is more aptly named than the killer whale. It travels in schools of from a few individuals to forty or more. They move along rapidly in close formation, rising and diving at a uniform pace. Seals, whales, and dolphins frantically

## Killer Whale

seek safety at the approach of a pack of killers. The hair seals make for shore and some of the whales head toward the beaches and slide into shallow water.

It is hardly likely that a pack of killers would attack the great sperm whale, but we know they do attack and kill the California grey whale and probably some of the other great whalebone whales. A pack of killers will encircle a large whale, leap at it from all sides, tear at the lips, and rip out the tongue, until the animal is exhausted and cut to pieces.

The killer whale is the only cetacean that feeds on its own kind and on other warm-blooded mammals. One old writer, speaking of its rapacious habits, claims that a killer whale was seen with a seal under each flipper, a third tucked away under the dorsal fin and a fourth in its mouth. Of course this is physically impossible. But Scammon, a modern scientist and authority on marine mammals, relates how killer whales may sometimes "be seen peering above the surface with a seal in their bristling jaws, shaking and crushing their victims."

In northern waters the killer pursues the walrus. The killer is no match for the animal, whose massive tusks afford adequate protection. It is the young the whale hunts. A walrus cub will climb on its mother's back for protection and cling to her tightly while she carries it to safety.

A killer whale can swallow a porpoise or a seal whole. Some conception of its gluttonous ferocity can be gathered from the fact that fourteen seals and thirteen porpoises were found in the stomach of one individual that measured twenty-one feet.

There are two species of killer whale: the **Atlantic Killer Whale**, and the **Pacific Killer Whale**. They are much alike in appearance and habits, except that the Pacific form lacks the white patch

over the eye.

**The False Killer Whale, or Little Killer Whale**, *Pseudorca*, found in all seas, is a gentleman compared to the true killer whale. Although smaller than the true killer, this species is still large when compared with other dolphins. Its usual length is twelve feet or so; extra-large individuals will measure eighteen feet in length and weigh one and a half tons.

The false killer is completely black and has a short dorsal fin. There are from eight to twelve strong teeth on each side of the upper jaw and on each side of the lower. Despite its massive form and formidable appearance, the animal feeds for the most part on squids and cuttlefish.

As with some of the other cetaceans, great schools of false killer whales invade shallow water, where they are left to die by the receding tide. Hundreds of individuals have beached themselves in mass in northern Scotland and in South Africa. So far, no one has offered a plausible explanation of this strange sporadic behaviour. It certainly is not accidental, since no seafaring mammal is stupid enough to involve itself in such a predicament unless driven by some overwhelming urge.

**The Blackfish, Pilot Whale, or Caaing Whale**, *Globicephala*, is not a fish but a member of the dolphin clan. All that the name "blackfish" tells us about this big mammal is its colour.

The other popular names of the blackfish do reveal something of its habits, however. People call it a "pilot whale" because it will follow a leader blindly, even to certain death. The name Scotsmen have for it is "caaing" or "ca'ing whale." They are no longer sure why they gave the animal this name. "Caaing" means both "driving" and "ca'ing." Some say the

## Bottle-nosed Dolphin

word comes from the practice of driving schools of blackfish into fjords, others that it alludes to the bellowing noise the whale makes when it is beached.

We find the blackfish in all seas except those of the polar regions. It measures up to twenty-eight feet in length and has a beak, like other dolphins, but a short one. *Globicephala* means "ball head." The blackfish's head is rounded; the forehead bulges. The animal has glossy black skin, the only markings on it being a white line on the chest that broadens into a heart-shaped patch on the throat.

Blackfish travel in schools of many hundreds of individuals that migrate north in the spring and south in the autumn. They swim at a good fast pace, groups rising and diving together in perfect unison. Squids and cuttlefish form a large part of their diet, which they vary with shoal fish in season.

The dolphins, like the whales, feed on living animal life. There is, however, a unique exception, the **White Dolphin**, *Sotalia*. One species that frequents the Cameroon River in Africa is a vegetarian. A small amount of vegetable matter has been found in the stomach of other whales but in this species no other food was present.

Folklore relating to this ghostlike whale is prevalent in its tropical homeland, and some legends are surprisingly contradictory. In China the animal is looked upon as a creature of ill omen and even its name is taboo, while to the natives of South America the white dolphin is a sacred animal that will bring ashore a dead or drowning person.

**The Spotted Dolphin**, *Stenella*, is often seen from coastal steamers travelling along the Atlantic shores of the United States. Its spots are not discernible except at

close range. The animal has been known to keep ahead of steamers travelling at fifteen knots.

Perhaps the most famous single dolphin in history was the one named Pelorus Jack. This friendly fellow belonged to a group known to science as **Risso's Dolphin**, *Gramphidelphis*—another warm-sea dolphin, more or less solitary in its habits.

Pelorus Jack was a tradition to all who travelled the Nelson-Wellington passage of New Zealand about half a century ago. No ship entered or left Pelorus Sound without being escorted for about five miles by this famous dolphin, leaping and gamboling about its bows.

Occasionally Pelorus Jack would disappear for a few weeks—even a month or more—but eventually he would reappear in his old haunts. For more than ten years the dolphin enjoyed absolute protection, granted by the New Zealand legislature.

Finally, in April, 1912, Pelorus Jack disappeared for the last time. What his fate was, nobody knows, but his memory still lives on in New Zealand.

**The Bottle-nosed Dolphin**, *Tursiops*, should not be confused with the bottle-nosed whale, an entirely different animal. This dolphin is the one most frequently seen just beyond the breakwaters by visitors to bathing beaches in temperate and warm climates. It is a sturdy creature, ten or twelve feet in length, and travels in schools sometimes numbering several hundreds. (Incidentally, it is one of the few cetaceans whose heartbeats we have a definite record of: 110 when breathing and fifty in a dive.)

**The White-beaked and the White-sided Dolphins**, *Lagenorhynchus*, are large deep-sea animals. They are perhaps the most gregarious of all the cetaceans, schools of fifteen hundred not being

## Irrawaddy Dolphin

unusual. They are common in the North Atlantic, and feed on fish, squid, and crustaceans. Quantities of hermit crabs and the snail known as the common whelk (the kind used for purple dyes) have been found in their stomachs.

In the southern seas the **Black and White** or **Skunk Dolphin**, *Cephalorhynchus*, is the common species. There are several kinds, recognized by the pattern of black and white markings. Commerson's Dolphin is the best known of this group. It is frequently seen by passengers on ships passing through the Straits of Magellan.

Either in sport or for a definite purpose the **Irrawaddy Dolphin**, *Orcella*, squirts water from its mouth in an upward and forward direction. It is definitely water and not moisture-laden breath that is expelled from the lungs.

A slate-blue beakless creature with a curiously rounded bulging forehead, the Irrawaddy Dolphin will measure seven or eight feet. Native fishermen in Burma

believe that it intentionally leads or drives schools of fish into their nets.

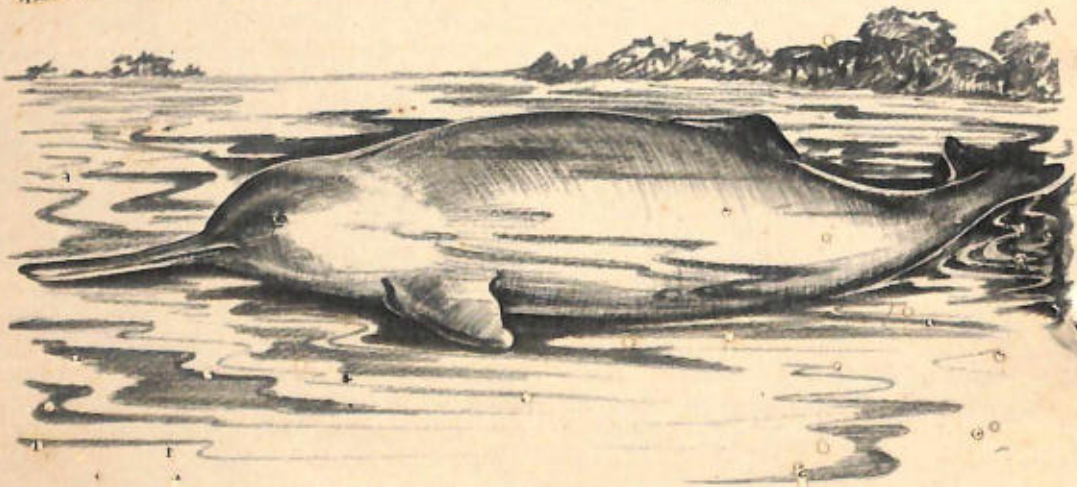
## River Dolphins

River dolphins are members of a waning group (family Platanistidae) found today only in the fresh or brackish water of southern Asia and tropical South America. They differ from the true dolphins in having each of the bones in the neck separate as in land mammals, instead of all seven being joined together in one piece. These animals possess a very long, narrow beak and jaws studded with numerous teeth.

Most famous of the group is the **Ganges River Dolphin**, *Platanista*. Natives, in naming an animal, often will imitate the sound it makes. The Indians call this dolphin the "Susu," which is a fairly accurate rendering of the noise it produces when it spouts. Poor susu is almost blind, and probes for prawns and sluggish fish in the mud at the bottom of the Ganges

### Ganges River Dolphin

**One of the four species of small whalelike mammals called Platanistids or River Dolphins. These animals appear to have a very primitive ancestry. They live mainly in freshwater, and one notable feature is the long birdlike beak.**



and Indus.

Another curious species, the **Chinese River Dolphin**, *Lipotes*, is also blind, or nearly so. This animal, blue-grey in colour, may reach a length of eight feet. Its dorsal fin, when it appears above water, is supposed to resemble a flag.

We find this dolphin only in the fresh-water lake Tung Ting in Huran Province, China, six hundred miles up the Yangtze. Presumably it was "stranded" in the lake a long time ago, but the natives have their own way of explaining how it got there. They believe that it is a descendant of a princess who perished in the lake many years ago.

None of the fresh-water dolphins grow over nine feet in length, and some are quite a bit shorter, like the **La Plata Dolphin**, *Stenodelphis*, which does not reach seven feet. This creature travels and breeds in small schools in the estuaries of large rivers along the Atlantic coast of South America. It feeds on the shoals of silvery mullet and the so-called "croaker" fish.

## Porpoises

The porpoise differs from the dolphin in having a blunt, rounded head and no beak. Otherwise, it is much the same kind of animal. It frequents coastal waters and goes far up large rivers.

Like the stormy petrel, the porpoise has had the reputation of foretelling foul weather. To quote Sir Francis Bacon: "Porpoises, or Sea Hogs, when observed to sport and chase one another about ships, expect then some stormy weather."

How such traditions begin, one can readily guess. Some sailor must have seen porpoises playing as Bacon relates, and then a storm followed. Since one event came before the other, it was mistaken for

the cause. As we have seen, the presence of dolphins meant fair weather to old seafaring men.

The porpoise (the name means "sea hog"—from the French *porpoisson*) was once considered a great delicacy, and was a dish fit for kings as late as the reign of Henry VIII. As it was considered to be a fish, it could be eaten on fast days and was served with a sauce made from bread crumbs, vinegar, and sugar.

**The Common Porpoise**, *Phocaena*, is one of the best known of the cetaceans. It measures from four to six feet in length, and possesses a rounded head and a small triangular dorsal fin. Its home is in the coastal waters of the temperate northern seas.

Common porpoises are sociable and travel in small schools varying from a few individuals to seventy-five or one hundred. The newborn calf, from thirty to thirty-four inches in length, is nursed by the mother as she swims tilted over on one side. These animals feed on crustaceans and squids as well as on various kinds of fishes, such as whiting and rock cod, that are found in the shore waters of the Atlantic and Pacific.

**Dall's Porpoise**, *Phocaena dallii*, is the black and white porpoise that frequents the inland waters near Kodiak and the Aleutian Islands in the North Pacific. Another species, the **Finless Black Porpoise**, *Neomeris*, dwells in the coastal waters of Asia from western India to Borneo and southern Japan. As much at home in fresh water as in salt water, it ascends rivers for a distance of one thousand miles from the coast. Its name describes it well—it is level black on the back (paler below) and lacks a dorsal fin. The dolphins and porpoises make up the family Delphinidae.

## Whalebone or Baleen Whales

Although this group is not so impressive as the toothed whales in number of species, in it we do find some of the most remarkable of all whales: the blue whale—the greatest creature that ever lived—and the humpback whale, the weirdest-looking animal of its kind. The females, if not deadlier than the males, are at least larger.

The whalebone whales are the giants of the sea, varying in length from under fifty feet to over one hundred. It seems odd that these leviathans should feed upon tiny organisms, for the most part. The whalebone whales, we saw earlier, have, projecting downward from the upper jaw, instead of teeth, hundreds of whalebone or baleen plates, to which the animals owe their common name (also the scientific name of their suborder, Mysticeti). These plates serve as a food strainer.

As explained at the start of this chapter, the whalebone whale takes into its mouth water that is alive with minute plants and animals, called plankton, found at the upper levels of the sea. The water spills out but the catch is kept inside the mouth by the whalebone filter, through which it cannot escape. A quick upward move-

ment of the tongue and the water is forced through the strainer. The whale's dinner, now dry, is flung down its throat and swallowed. Not all the baleen whales are plankton feeders exclusively. Some of them, like the least porpoise, also feed on cod, herring, and many other kinds of fish.

The great yawning mouth of a bowhead whale could easily accommodate a man standing on its huge tongue. The monstrous lips are seventeen feet long or more from the corner of the mouth to the front of the strange face. The width of the mouth, straight across from corner to corner, is nine feet.

The whalebone or baleen of this species may number 360 closely packed blades on each side of the mouth—the lengthiest, near the middle of the row, may be twelve feet long and a foot wide, and have a hairy fringe two feet long. The whalebone itself is imbedded ten inches in the gum. Other whales have much shorter baleen and fewer plates than the bowhead.

We may suppose that in the dim past the whalebone whales actually had teeth. They show traces of teeth when they are in embryo, but at birth these have disappeared completely.

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### Grey Whales

**The Grey Whale, *Rhachianectes*,** a great slate-grey or black animal, often comes close to terra firma, being a prowler of inshore waters. Its scientific name means "surf swimmer." The animal has been

seen to lie and play among the breakers in water not more than thirteen feet deep. When the tide goes out, it may lie and bask in the sun in no more than two feet of water.

Sometimes a pack of killer whales will attack the grey whale. Then it makes for shore, sliding into water too shallow for the killers to approach. At other times, however, it seems to become paralyzed with fright: it turns on its back and floats belly up. This manoeuvre does not make for a long life.

Once the grey whale haunted the inlets and bays of the North American coast and the Sea of Japan in large schools. Today this single member of the family Rhachianectidae has almost vanished from the earth. If found anywhere, it will be in the North Pacific.

The body of this whale may grow to a length of fifty feet. Usually it is marked by light circular scars, which we suppose are caused by parasites such as barnacles. The animal has a rather small head for a whale. There is a slight protuberance in place of the dorsal fin, and two or four furrows run lengthwise on the throat. The whalebone with which it traps its food is yellowish, thick, and heavy, measuring fourteen inches or longer. As with other whales, you may tell the grey whale by its spout—it rises vertically to a height of ten or twelve feet in the air.

## Rorquals

**The Common Rorqual or Finback Whale**, *Balaenoptera physalus*, is the fastest swimmer of all the whales: it can race along at a speed of thirty miles an hour. A mighty creature that may grow to a length of eighty feet (sixty is more common), it can pull a ship when harpooned. One finback, or finner, as this species is familiarly known, towed a whaling vessel for three hours at a rate of twelve miles an hour. What makes this all the more remarkable is the fact that the ship's engine was running three-quarters speed astern.

Speed and strength are not the only traits for which the finback is outstanding. This whale has pluck. The whaling vessel *Gracia*, in 1894, was attempting to take a finner when the sea giant turned on her and charged. There was a slattering impact; the *Gracia* began to fill with water and went down. The crew escaped in boats.

The finback is the largest whale commonly seen on the North Atlantic coast of the United States though it frequents all the seas. In general, it is greyish above and white below, has a long, slender, wedge-shaped body and its head is rather small. Strangely, the right side of the head is always whiter than the left side. On its throat the finback has numerous furrows, running lengthwise. Its family name, *Balaenoptera*, means "whales with a wing." Like other members of this group (including the humpback and the blue whale) it has a dorsal fin, in this case short and placed far back on the body.

We have observed that the finback is not afraid of ships. Sometimes it will sport about close to them. When it rises to the surface, it sends its spout up fifteen or twenty feet in the air in a narrow column that expands as it rises.

The huge finner migrates with the seasons. Mating takes place in the warmer seas during the winter. The finback then moves north or south to the polar regions for the summer months. Ten or twelve months later, in the autumn, it returns to tropical waters. Here the calf is born. Usually there is only one young at birth, but occasionally there are twins. At birth, the calf's baleen is already coming into place and shows clearly in the gums. The calf is about twenty-two feet in length when born. It is not weaned until six months of age or older. Its life expectancy is about twenty years on an average.

It is hard for us to picture for ourselves

## Sei Whale

the bulk and proportions of this gigantic creature. Still, these figures will offer some idea of how large it really is: it weighs as much as 150 oxen—or twenty-five elephants! In a seventy-one-foot finback of 131,000 pounds total weight, the bony skeleton weighed 18,500 pounds; the head and jaws, 6,000 pounds; the whalebone, 1,050 pounds; the tongue, 2,700 pounds; and the heart, 840 pounds. The largest finback on record was eighty-two feet long.

The common finback whale has some smaller relatives. The **Sei Whale** or **Rudolphi's Rorqual**, *Balaenoptera borealis*, is found in all seas from the Arctic to the Antarctic. Bryde's whale, a related species, is common along the coast of the Cape Colony, South Africa. Both are quite similar to the finback but rarely exceed fifty-six feet in length. Norwegian fishermen named this rorqual the "sei whale" because it arrived on their fishing grounds at the same time as the sei, or coalfish.

The **Lesser Rorqual**, or the **Little Piked Whale**, *Balaenoptera acutorostrata*, no more than thirty feet in length, is the smallest of the whales with grooves on the throat. A distinctive white band crosses the upper side of its flippers. It favours coastal and inshore waters, where it is reasonably safe from attack by the killer whale. It was named "little pike" by the Scottish fishermen because of its tall dorsal fin.

**The Humpback Whale**, *Megaptera*, is a truly grotesque sea monster. This big black whale has a huge head, disfigured with rows of odd-looking protuberances. Knoblike growths form an edging on its long flippers: the rear border of its flukes is ornately scalloped. Whalers named it "humpback" because it arches its back when rolling over to dive.

The humpback has a habit of breaching—that is, springing into the air either

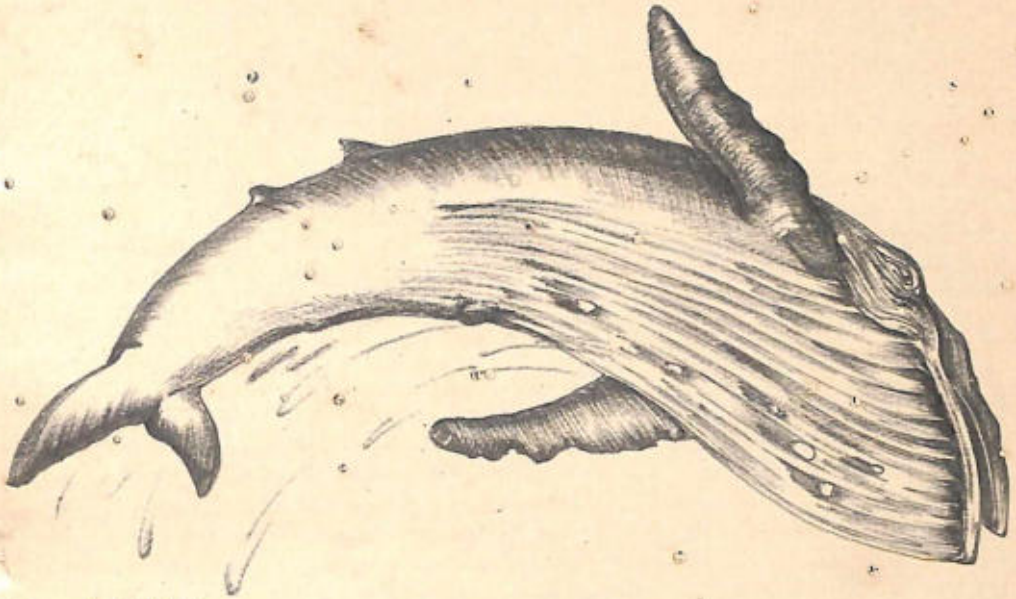
in play or to rid itself of barnacles. When it strikes the water again, its fifty tons of flesh and bone come down with a mighty splash that you can hear far off. It also indulges in lobtailing: it splashes the water with its powerful flukes again and again. It has two blowholes and sends up two jets of vapour that become one as they rise higher and higher and spread out. The spout is sometimes twenty feet high or more.

This whale has no fixed breeding season. The calf, born close to a year after the mating, is sizable. It measures fifteen feet or more at birth, and weighs up to two tons. The mother's affection for her baby is very strong. She will not leave it even in the face of danger and whalers used to take advantage of this habit by killing the calf first. Fortunately international law now protects baby whales.

In the Northern Hemisphere most of the young are born about March in the warmer seas, but these whales have moved north by May, probably following warm currents like the Gulf Stream. The humpback visits all the seas while following its regular migration routes. It spends the winter in the tropics. It may travel in schools or alone.

Twenty years is a fair estimate of the humpback's life. But not all humpbacks live their normal span of years. Besides the whaler's harpoon, the humpback must face the deadly teeth of the assassin of the seas, the killer whale.

Perhaps the most curious case of a humpback's death was mentioned in the *Transactions of the Natural History Society of Northumberland* in 1831. This publication reports a dead humpback that came ashore near Berwick, England, in September, 1829, and states that "on opening the mouth six cormorants were found in it and another in the throat, so that it was



### Humpback Whale

Shorter, and with a deeper body and larger tailfins than the Rorquals, the humpback is found in both polar regions and migrates in winter to the tropics.

presumed this whale had been choked in an attempt to swallow the birds." We may suppose that the cormorants were feeding on fish and the whale engulfed birds and fish together.

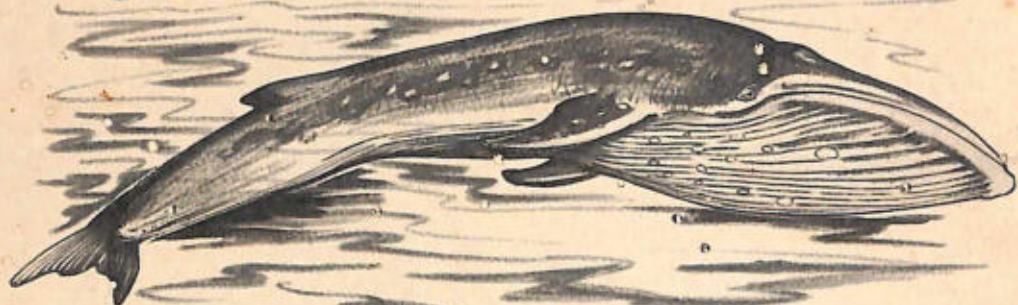
Like the finback or rorqual, the humpback has a dorsal fin, but the grooves on its throat are less numerous. From front to back, four hundred plates of whalebone, sometimes two feet long, hang from the roof of its mouth, and its lower jaw juts out far beyond its upper.

The maximum length for this thickset whale is about fifty feet. A forty-five foot humpback that was captured weighed 91,000 pounds; its heart, 425 pounds; and the whalebone, 425 pounds. It yielded thirty-three barrels of oil. The humpback's whalebone and oil are not of the best grade, however. A barrel of oil, by the way, equals thirty six imperial gallons.

**The Blue Whale, or Sulphur-bottom Whale, *Sibbaldus*,** is the largest creature that ever lived on this earth, either on land or in the sea. The biggest blue whale weighed on shipboard registered over three hundred thousand pounds, and was almost ninety feet long. No single shipborne scales could be used for so vast a bulk; the whale had to be dismembered and placed on the scales piece by piece.

The blue whale is not just the biggest—it is also the most powerful animal in existence. Its top speed compares favourably with that of our most up-to-date freighters. Although it normally cruises along at twelve knots, it can race along at twenty-seven knots. It is reported that one harpooned blue whale towed a whaling vessel—engines going full speed astern—at a rate of eight knots for a period of seven hours. Experts have estimated its greatest pull at four hundred horsepower.

## Right Whale



## Blue Whale

**Blue whales are actually shades of grey in colour. They live in the southern seas, and are the largest and most powerful animals that have ever lived.**

For all this display of speed and power, the blue whale, like most other large whalebone whales, feeds on small fare—but lots of it. More than a ton of plankton has been found in the stomach of a single blue whale. When it comes up from hunting in the water, the animal breathes out a tall, thick column of vapour, perhaps twenty feet high.

Where plankton is, there you may look for the blue whale. The periodic abundance of these small creatures governs its activities. The blue whale spends the summer near the polar ice pack of either the Arctic or the Antarctic. Like the finback whale, it prefers the southern to the northern seas. In winter it is likely to move toward the Equator.

Mating takes place in temperate waters, about July. Weighing four short tons and measuring about twenty-five feet long at birth, the calf is nursed by its mother for fully seven months, depending upon her for food until it has attained a length of about fifty feet. It is ready to reproduce at three years of age, but may not be full grown for another ten years.

Less social than the finback, the blue whale travels alone or with another of its

kind. It appears to be monogamous, but the case would be difficult to prove. The female is larger, and may grow to a length of one hundred feet or more.

Although we also call the blue whale the "sulphur-bottom whale," the sulphur colour on its underside is not a part of the animal. The colour is due to a coating of diatoms—microscopic plants picked up on the ocean surface. Superficially the blue whale looks rather like the finback. Its general colour, above, is bluish, as its common name suggests.

## Right Whales

**The Right Whale, *Eubalaena*,** was to the whalers of long ago exactly the right or ideal prey for them, and that is how it got its name. It possesses an excellent supply of oil—anywhere from forty to one hundred barrels. It is rich in whalebone—it has about 250 plates on each side of its mouth, the longest about seven feet. Best of all, from the whalers' viewpoint, the animal is a slow swimmer and often does not put up too rough a fight.

The right whale has an extremely large head and a smooth, unfurrowed throat.

## Greenland Whale

The dorsal fin is lacking. (With the pygmy right whales and the bowhead, this animal forms the family Balaenidae, all being smooth-throated or finless whales.) Its chunky body is almost entirely velvety black and rarely exceeds fifty feet in length. Near the end of its muzzle it has a horny growth or "bonnet"; this is usually infested with whale lice—actually small shellfish.

The right whale mates in July or some time during the summer in the Arctic seas, and the young are born in January or February further south. Like other whales, the female bears a single calf which she nurses for six months or longer. She displays considerable affection for her baby.

The right whale's spout is double, and the animal directs it forward and upward about fifteen feet in the air. There are three species of right whales, all similar in general external appearance: the **North Atlantic Right Whale**, the **North Pacific Right Whale**, and the **Antarctic Right Whale**.

**The Pygmy Right Whale**, *Neobalaena*, is smaller than the right whale proper,

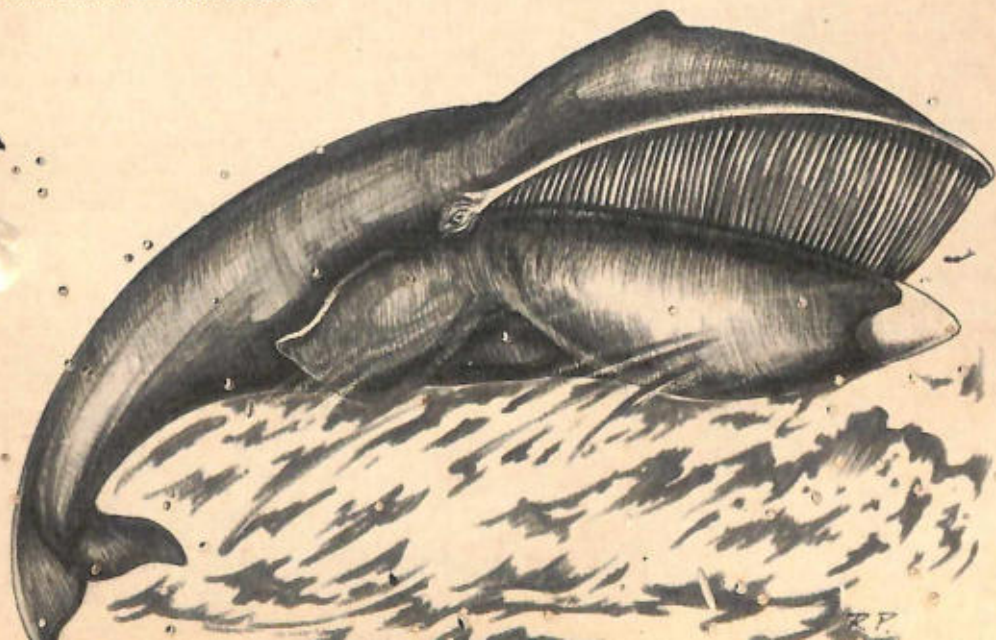
### Greenland Whale

This species has been heavily hunted since the 16th century and is now almost extinct.

being only about twenty feet long. A very rare mammal, it is found solely in Australian and New Zealand waters and off South America. We know little of its habits. It has fourteen pairs of ribs instead of the usual seventeen and, unlike other right whales, possesses a dorsal fin. Some pygmies have been stranded on the eastern shores of the Great Australian Bight, usually during a time of high and violent spring gales.

Another member of this family is the **Bowhead**, or **Greenland Whale**, *Balaena*, a smooth-throated species, from fifty to sixty feet long, found in the Arctic, the North Atlantic, and the North Pacific. Its enormous head is more than one-third the animal's total length. The mouth could easily hold an ox—but the throat is not big enough to swallow anything larger than small fish like the herring!

The bowhead is almost extinct, so extensively has it been hunted for the 1,700 pounds of whalebone and ninety barrels of high-grade oil the average individual may yield. The fact that it cannot swim over eight miles an hour has not favoured its survival.



## Carnivores—the flesh eaters

The wild dogs form only one family (Canidae) of the great order of the Carnivora, or flesh-eating mammals, to which the following sections are devoted. We find the carnivores in all kinds of places except the high seas. The wolf patrols the plains and prairies, and the cat keeps watch in the forests. The otter and the mink inhabit the freshwater rivers. The badger goes underground, while the marten climbs trees. The raccoon haunts the swamps and marshes; the polar bear plies the Arctic coastal waters, and in the tall grass and brushlands the weasels are forever alert.

Not all carnivorous animals belong to the order Carnivora. Some of the marsupials such as the Tasmanian wolf feed on flesh; opossums, hedgehogs, certain bats, and even some rodents do the same. On the high seas the killer whale also takes a large toll of warm-blooded animal life. All of these mammals belong in different orders.

On the other hand, not all members of the order Carnivora are strictly carnivorous. Many of them, such as the

bears, feed to a large extent on fruits, berries, and even grass. Some are exclusively insect-eaters, while others, like the giant panda, feed on nothing but vegetation.

Most carnivores do feed on flesh, however, and it is for this habit that they were named.

Now, what, you may ask, makes an animal a carnivore? The answer is: structure, not habit. The Carnivora have sharp teeth and powerful jaws. The canine teeth are especially long and dagger-like, to hold the prey, and most carnivores have sharp shearing teeth, known as carnassial teeth, for cutting flesh and sinews. Nor is this all; in many carnivores the grinding teeth, or molars, are strong and thick, natural bone-grinders.

You see, then, that these animals are well equipped with the tools for capturing and devouring other animals, whether they use these tools or not. The carnivores have sharp claws, too, and at least four toes on each foot. In the cats, the claws may be drawn in or thrust out at will; the dogs' claws are always extended.

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### Carnivores: I

## The Wild Dogs

Runners—that is the word for the wild dogs and their relatives. In past ages, however, they were not the speedy creatures we are familiar with. They once walked flat-footed upon the earth. But a swift animal is likely to be a longer-lived one. In time a change took place in the dog family: they came to walk about

and run about on their toes. Nature favoured them, and they replaced their slower ancestors.

Although the wild dogs, as we may call this group, can swim, and a few are actually able to climb trees, they are built for a life on the ground. By and large, they have a long, narrow muzzle, large,

erect ears, slender limbs, and a lengthy, bushy tail.

The wild dogs have good eyesight and a keen sense of hearing—much better than man's. But they are even more remarkable for their exceptionally well-developed sense of smell. They can follow a trail through the forest on a dark night as easily as a man can follow a well sign-posted highway in broad daylight.

The domestic dog was tamed by man before the dawn of history. Many believe it was the first animal brought under human domination, and we possess evidence that the man of the New Stone Age had his own dog in 6,000 B.C.

In a general way, the dog was derived from the wolf stock of Europe and Asia (though not from the true wolf). By selective breeding, man has produced different types to serve him in diverse ways: as sheep and herd dogs, racing dogs and watch dogs, sled dogs and hunting dogs, to name only a few. Today there are some 145 popular breeds of dogs—more than we have of any other domestic animal.

Dogs will interbreed readily with wolves and jackals, but they do not breed with foxes, from which they differ significantly. Dogs, too, bear more young on an average than any of their kind. It is not unknown for a domestic dog to have sixteen puppies; the record birth, that of a fox terrier, was a litter of twenty-three young. The highest number of cubs in the wild is fourteen (for the wolf), but the average is six or seven.

## Wolves

**The Grey Wolf, or Timber Wolf,** *Canis lupus*, has never, to the best of our knowledge, made an unprovoked attack on man in North America. It has been the author's experience to sleep out alone of a

winter's night in northern Alberta, without a fire, alongside a fresh kill. The wolves closed in when it got dark. Some stood and watched him from less than ten feet away. But not one made an unfriendly gesture, nor did they attempt to steal the kill.

Yet you will hear stories of American wolves attacking men without provocation. In number, such reports are few, and we have not had reliable proof of a single one of them.

On the other hand, there are so many stories of wolves falling upon and killing people in the Old World, especially in Russia, that we cannot discount such tales altogether. We may suppose that these wolves were on the verge of starvation and were attracted by the horse the man was riding or driving.

A long time ago the grey wolf was much commoner than it is today. It ranged over the entire Northern Hemisphere, from the plateau of middle Mexico to the Arctic regions, excluding the extreme desert areas. In Asia, we believe it prowled as far south as the northern regions of the Indian peninsula. But now we find the grey wolf only in the unsettled parts of its former range.

Throughout the ages human beings have waged, unceasing war on the grey wolf. As civilized man has spread over the world, bringing his domestic stock with him, he has driven the wolf off. So it has retreated into the barren wilderness, far from human habitation. In a few states of the American West, in the wilderness of Alaska, Canada, and Mexico, it still survives. A hunted animal with a price on its head, it is well on the way to extinction.

The grey wolf disappeared from England and most of Europe hundreds of years ago. It seems hard to believe that once it wandered over those lands in sizable numbers. Wolves were so common

## Grey Wolf

and dangerous in England at about the time of Alfred the Great that the month of January was set apart for hunting them.

It is easy to understand why people have feared wolves since first they encountered them. For man or beast, the wolf is not an opponent to be underestimated. It shows a high degree of intelligence—in this respect it compares favourably with the elephant, horse, or gorilla. The grey wolf is a mighty fellow, big and strong. Some Canadian wolves weigh up to 175 pounds. A large grey wolf will measure four feet long without its twenty-inch tail. It stands three feet at the shoulder.

Although we call the common wolf the "grey wolf," that is not always its colour. Its long, thick coat—it is much like that of the German shepherd dog—varies in shade from almost black to white. Some wolves may be brindled brown or yellow.

The wolf has comparatively short ears. This is advantageous in a cold climate, for it helps to prevent too much radiation of body-heat. Its long, bushy tail serves a special and useful purpose. When the wolf sleeps out, it curls up and wraps the tail snugly around its naked nose and its feet, protecting them from the frost.

From our viewpoint, the wolves offer a model picture of family life. They mate in the early spring. Usually the male will stay with one mate for life, unless he is forcibly separated from her. He helps her dig the underground den and the tunnel which leads to it—the latter may be thirty feet long. (Sometimes the pair will use a rocky cave or the abandoned burrow of another animal.) For their home they generally select the more remote parts of the wilderness, near a hilltop with an unobstructed view of the surrounding country.

Two months or so after the mating, the pups come into the world. Six is about the

average number of whelps, but from four to fourteen pups may be produced in a single litter. Most pups are born in May, or a month before or after. The newborn pup has a sooty-brown or light grey-blue coat of close hair. The animal cannot see at birth; its slanting, deep-blue eyes open between the fifth and ninth day afterward. Two months later the eyes take on a yellow-grey colour, which is typical of the adult.

At the beginning, the whelps' sole food is the milk provided by their mother. But in a few weeks she starts to wean them. Now she regurgitates for them meat which she has partly digested in her stomach. The whelps move more and more from a milk diet to one of flesh. In the early nursing stage the mother does not leave her young at all, relying for her own food upon her mate or a close relative who brings meat to her den.

It is common practice for the male to hunt in faraway fields and bring back the kill in his stomach, to be disgorged and fed to the whelps. When not hunting, he dozes on a hilltop close by the den and keeps watch. If he detects any threat of danger, he first warns the family, then slowly retreats, drawing the enemy away from the den as best he can, yelping if necessary to attract attention to himself. If some misfortune ends the life of the mother, her mate will take over, feeding the pups on disgorged food and looking after them.

In their early weeks the pups appear to be all head and legs. But they grow rapidly. After three weeks the parents remove them from the den to live above ground. From this time on they accompany the parents in their daily activities and thus learn to hunt and to take care of themselves. Family ties are strong, and there is considerable display of affection until the whelps are fully grown. When one mem-

## Red Wolf

ber of a family is caught in a trap, the others will make every effort to release it.

The young wolf is well grown when a year and a half old. It is interesting to note that females mature faster than males. Males are not fully adult until they are three years old, but females are ready to breed at two. A wolf is approaching old age at ten or twelve years. At fourteen its teeth are worn down; then it is known as a "gummer" to the trappers. Twenty years is about as long as a wolf lives in the wild.

Many fanciful things have been said and written about the feeding habits of the grey wolf. You may have heard that a hungry wolf will fill its belly with mud; that wolves are fattest at the time of the full moon and grow thinner with the waning moon; that they sustain life by sucking their forepaws; and that they drink only the blood of their victims. None of these things is true. Still, the reality of how a wolf gets its food is very impressive.

Usually, the grey wolf hunts in packs. Such a pack is not the great, fierce crowd of a hundred or more sharp-fanged beasts

you may have read about in fiction. The wolf pack generally has in it no more than a dozen animals, all members of one family. Besides the parent wolves and their young, there may be several adult relatives.

Often these animals have a favourite hunting runway, perhaps a hundred miles long, and they seek their prey along its byways with marked regularity, killing deer, mountain sheep, caribou, and moose. They have been known to pursue herds of bison and to slaughter sick and aged adults, as well as tender calves, when they lagged behind. They will chase healthy animals as well, keeping up a pace of twenty miles an hour for a long time.

There are a large number of grey or timber wolves, but all are geographical variations of the typical species, *Canis lupus*. Smaller than the grey wolf and more like a coyote is the **Red Wolf**, *Canis niger*. Once found in the Mississippi valley, the Gulf states, and Georgia, it is restricted nowadays to the Ozark Mountains and a few localities in Louisiana and Texas. It has a coat of rather coarse hair coloured in shades of tawny and grey.

### Coyote

**This wild dog, though extremely wolflike in appearance, is hardly half the size of the great grey wolf.**



## Coyote

**The Coyote, Prairie Wolf, or Brush Wolf**, *Canis latrans* ("barking dog"), sings the evening song of the American West. After sundown, it leaves its lair and finds a nearby knoll. Here it sits down, alone or in company, to give voice to its serenade. One lone animal will sound like a whole pack as it runs through its entire gamut of cries: from short yaps, barks, and whines, to a prolonged lamenting howl that carries for a remarkable distance on the still night air. This evening performance is a regular ritual with the coyote.

The coyote is widely hunted, not because of its singing but because many shepherds consider it a wholesale destroyer of their stock. But experts have shown that the coyote kills only a fraction of the number of domestic animals it is thought to. It does more good as a destroyer of rodents than harm as a killer of livestock. Sheep, after all, need grass, and rodents consume it. The coyote, which can travel at a speed of forty-five miles an hour, is the only mammal fast enough to catch a jack rabbit, and the slower rodents easily fall prey to it.

Aside from rabbits and rodents, the coyote devours birds, reptiles, carrion, and insects. It stores food like other dogs. The coyote even goes fishing! Another surprising thing about its diet—it will feed on fruit and vegetables.

With a companion—the animal often hunts in pairs—the coyote may attack deer and elk and bring them down; but sometimes luck and the quarry's sharp hoofs and antlers bring defeat and death to the coyote. And it must look out for its big cousin, the wolf. The wolf is fond of the coyote—but only as food.

Coyotes never harm people. In the United States National Parks these animals are often quite tame, and will take food from your hand.

Like the wolves, coyotes usually mate

for life—but should misfortune overtake one, the other will usually mate again. Breeding time is in February, as a rule, but earlier in the warm regions.

Shortly before the day comes for the female to have her pups—about two months after mating—she selects a den for the nursery—with the aid of her mate. It may be in a cave, a natural shelter among the rocks, a hollow tree or a burrow dug in the ground. The nursery is quite bare, without any leaves or grass for a bed. If the pair make a burrow, they usually dig branching tunnels that may extend twenty-five or thirty feet underground to the chamber, and dig a ventilator through the roof. The two coyotes now take up residence inside the chamber.

A few days before the family arrives, the male coyote must leave the den and find himself a home close by. His mate stays behind and bears her litter, six babies as a rule but sometimes as many as nineteen.

While the babies are small the mother has no time to get about. The male is responsible for keeping his family supplied with food. He does not enter the den, but brings his daily offering of rabbits, rats, and mice and lays them at the entrance. Sometimes he disgorges partly digested food, and sometimes the mother does so as the infants are weaned and prepared for the hearty meals of meat they will consume later on. As the pups grow older, it takes all the time of both parents to keep them in food.

When six weeks old, the pups begin to romp and play outside but are not ready to join the chase until two months old. At about this time the father is permitted free use of the den and with the mother begins the serious duty of teaching the pups to hunt. The parents take their young on longer and longer trips away from the nursery and show them tried



### Grey Wolf

**The largest and wildest of all the dogs.**

and true coyote ways of capturing their own mice, gophers, ground squirrels, and other prey.

By the autumn, the young coyotes are ready to leave the comfort of their parents' home to seek their own fortune in distant lands. Sometimes they must travel a hundred miles or more to find an untenanted range of their own. Inexperienced as they are, the adolescent pups fall an easy prey to their enemies. Many die of hunger and exhaustion before they can get located in new territory. Thirteen years is a long life for a coyote.

Coyotes sometimes mate with domestic dogs. The hybrid offspring of such a match lack the even disposition of the domestic dog and are not so easy to train.

Normally a creature of the open plains, prairies, and desert regions, the coyote has occasionally entered the forests. We find it in western and central North America, from Costa Rica north to Alaska and from the Pacific coast east to Ohio and Michigan.

Scarcely half the size of the grey wolf, this wild dog is an attractive slender animal, with thick, long fur, erect ears,

and a lengthy, bushy tail tipped with black. Its coat is greyish or tawny in colour, nearly white on the under parts. A full-grown coyote stands twenty-one inches at the shoulders and weighs between twenty and thirty pounds (not so much, compared to the male wolf's sixty to one hundred pounds). It is about four feet long: one-third of this is tail.

**The Dingo, or Warrigal, *Canis dingo*,** presents a fascinating puzzle to us. This wolflike dog is the only wild carnivore living today in Australia. We do not find it elsewhere in the world.

Why should the dingo be Australia's only carnivore? We do not know; we can only guess. Once, long ages ago, Australia was connected with other continents. As we have seen, at that time a more primitive form of mammal life, the marsupial (of which the kangaroo is a well-known species) flourished in many parts of the earth. Geological changes took place. Australia became separated from the other great land masses, and the marsupials survived only inside her water-guarded borders, with minor exceptions. In other places they gave way before more advanced kinds of mammals, among them the carnivores. The kangaroo and its kind continued to reign supreme in Australia. It was impossible for carnivores to come in.

How, then, did the dingo travel across the ocean to Australia? We suppose it came there in boats with the first men, perhaps from the Malayan region. It must have been very long ago, probably during the Ice Age or Pleistocene era, at least forty thousand years back. We find the dingo's fossil remains with relics of that period, but not with older ones. We believe it was a tame dog in those days, and that after a while it ran wild. The dingo even in the most remote places in

## Jackal

Australia has still a curious hankering after man and his fleshpots—and this despite the fact that it has been outlawed as a ferocious killer of sheep, and is always killed on sight for the price set on its scalp.

The dingo prowls the open plains of Australia as well as the open forests. A handsome, medium-sized wolf, it stands two feet at the shoulder. It is four feet long. About one-quarter of this is bushy tail like the wolf's. A dingo's soft fur is usually rusty red or tawny with the toes and the tip of the tail white, but the coats of some dingos vary from red to black.

The dingo's habits are much the same as the coyote's. It hunts singly or in family parties and preys upon kangaroos and other game, which cannot long withstand its wolflike fangs. The pups—there may be four to eight of them—are born in an underground burrow, a cave in the rocks, or a hollow tree. A purebred dingo does not bark like a dog but utters a series of yelps and a plaintive howl.

## Jackals

**The Jackal**, *Thos (Canis)*, suffers from a sorry reputation that it does not altogether deserve. Most of us think of the jackal solely as a skulker and a scavenger—how much of this picture is really true to life?

The jackal is the common wild dog of the warmer parts of the Old World. In the villages and towns of Asia and Africa we sometimes see small bands of jackals or single individuals skulking at night through the streets of outlying districts and scavenging among garbage heaps in search of food.

In the wilder parts of its range the jackal is always on hand to partake of the larger game killed by a lion or tiger. On several occasions the author has seen

a lion with its kill and, a few feet away, a jackal waiting patiently, and a dozen or more vultures sitting in a nearby tree. Neither the vultures nor the jackal would go closer until the lion had had its fill and left. Then there was a free-for-all and the jackal moved in to get its share with the vultures.

In Africa the jackal is sometimes known as the "lion's provider." Folklore has it that the jackal acts as a scout for these large cats, and, having found suitable prey, summons the hungry lion to the kill. For its services the jackal receives a share of the prey. As a result of these old traditions, we sometimes apply the word "jackal" to a human being if we want to say that he engages in low or sordid work for someone else's benefit.

Yet the jackal hardly merits our scorn for any of this. Quite the contrary; the animal serves a very useful purpose. As a scavenger, the jackal removes carrion, which might otherwise provide a breeding place for the germs of disease. It is a first-rate mouser and ratter—qualities that make it a boon in the rodent-infested areas of the Old World. (True, it has an unfortunate penchant for varying its diet with domestic fowl and an occasional lamb or kid, and this habit has not served to endear it to mankind.) It also eats other small mammals, lizards, and insects—even grapes, sugar cane, and coffee berries. In fact, it feeds on almost anything edible.

Rarely does the jackal make its home in deep forests; it prefers open or lightly wooded country. Its habits are stealthy and secretive, and we seldom see the animal, although it is by no means strictly a night prowler. Near more populated areas, it does not venture abroad much before dark. The jackal spends the nights hunting, usually in family groups or packs of three to six

individuals. No mean runner, it is credited with a speed of thirty-five miles an hour.

Like the coyote, the jackal sings an evening song. At sundown it leaves its retreat, proceeds to the centre of a small clearing or to a little knoll, sits up on its haunches, and howls.

Those who have heard the jackal's cry do not soon forget it. A long wail, it is repeated three or four times in succession, each repetition being pitched slightly higher than the preceding one.

In its breeding habits the jackal is much like other wild dogs. The female gives birth in a burrow or cave, about two months after mating. Usually her litter contains four pups, but she may have as many as nine. Both parents are active in foraging for food for the cubs.

Only when jackals are about to produce a family or have to care for an already existing one, are they really sociable. At other times, they lead a solitary life. When they travel together, it is food and not love of company that attracts them.

Jackals seem to survive fairly well in captivity. In the London Zoo one lived for over thirteen years, while nineteen others had an average life span of more than eight years. In the wild, though, few jackals—or other animals—ever die of old age.

There are a number of different kinds of jackal. The **Indian Jackal**, *Thos aureus*, a typical species, looks very like a wolf, but is smaller and more slender, with large ears and a sharp-pointed face. Its head and body length is about two and a half feet, its tail about eight inches. It may weigh about twenty-one pounds. We find this species from the Middle East and northern Africa through southern Asia to India, Ceylon, and Burma.

In the mountains of Thailand and Burma dwells the **Himalayan Jackal**, which is slightly larger and brighter in



### Jackal

The nocturnal scavenger of the dry and tropical regions of Africa and Asia.

colour than the typical grey jackal. A black saddle, which contrasts sharply with reddish-brown flanks and legs, distinguishes the **Black-backed Jackal** of eastern and southern Africa.

In this part of the world, too, is found the largest of the group, the **Side-striped Jackal**. Full grown, it may weigh up to thirty pounds and stand seventeen inches at the shoulder. The general colour of its fur is buff grey, but the hairs on the sides of the body have light tips that give the effect of a stripe on each side.

### Foxes

The **Arctic Fox**, *Alopex lagopus*, is one of the few animals that spend the winter in the frozen reaches of the Arctic. When the temperature drops below freezing and the icy air carries a warning of still colder weather to come, the hardy caribou and the wolf begin to shiver, and move south to the shelter of timber. But the Arctic fox stays on, spending its whole life on the tundra, so far north that trees will not grow there.

Feeding as it does on ground squirrels

## Arctic Fox

and other small rodents, you might suppose the Arctic fox would be hard pressed to find a living when summer's green has vanished and the tundra has become one vast expanse of driven snow. The ground squirrels have holed up for the winter, and the lemmings are protected by the snow blanket. There are Arctic hares to be had, but they are fast and not over abundant.

However, the resourceful little Arctic fox has its own special method of procuring a winter supply of food. During the autumn, when squirrels and other rodents are filling their storehouses with seeds and nuts, the Arctic fox gathers a harvest, too—but this is a live one, of lemmings, ground squirrels, and mice, which it kills and stores just below the surface of the ground.

Along the Arctic coast the foxes fare better. A whale stranded on the shore will feed a thousand foxes all winter. Polar bears are followed by these little foxes for a share in their plunder, since the great white bear is out hunting all winter and rarely eats more than a small portion of each kill.

The Arctic fox, for all its fearlessness, is not a large animal. It is not more than

twenty inches long, with a tail half as long again. In summer its coat is grey brown, but light hairs begin to come in later, and in winter it is snow white, without any markings whatsoever. Only its dark eyes and the black tip of its nose break the Arctic background of pure white. Its ears are rather short and rounded, an advantage in the land of ice and snow, since large ears are more easily frostbitten. We find it in the Arctic regions of both the Old World and the New.

In February the Arctic fox begins to lose its winter coat but the change is slow and the grey-brown hairs may not all grow until late spring.

It is in the spring that pairing takes place. We have reason to believe that the Arctic fox mates for life. The males fight fiercely for the lady fox of their choice, but once the courtship is over they settle down to regular family life.

In May, about fifty-two days after mating time, the cubs are born. The normal number is six, but there may be up to twelve in a litter. At birth they are little dark-brown balls of fur, weighing about two ounces each. The den-nursery, typical among foxes, is a safe retreat in the ground.

Each Arctic fox has its own special hunting territory on which other foxes are not permitted to settle. When the year's crop of young foxes leave their parents' home, they—like the young coyotes—have a hard time finding an untenanted location. Every three or four years a roving band of young foxes takes on the proportions of a migration, when thousands move together searching for the "promised land," where lemmings and other rodents abound. Some favoured few eventually find a homestead, but the majority perish in the attempt.

The short summer is over in August;



### Arctic Fox

This fox keeps alive through the Arctic winter by eating animals it has previously stored in the snow.



### Red Fox

**With a diet that is almost omnivorous, the fox probably does more good as an eater of rodents and insects than as a poultry killer.**

and by September the Arctic fox has donned its warm winter coat, and even the soles of its feet are padded. When the icy winds blow and the temperature drops down to 60° or 75° below zero, the fox can find comfort curled up in a snowdrift, breathing into the long hair of its tail, which acts as a sort of radiator of self-generated heat.

The typical Arctic fox lives on the mainland of both Asia and North America.

**The Red Fox**, *Vulpes vulpes* and *Vulpes fulva*, is one of the most hunted animals in the Northern Hemisphere. It is pursued for sport, for its golden-red coat, and because of the raids it makes on poultry. Through the years the very existence of the fox has been challenged, yet wily Reynard has not given up any of its boldness. The animal stays on, close to civilization, dwelling even in the suburbs of big cities.

Listen to some farmers, and you would think all the fox eats is poultry! They

would be well advised to try to understand the fox and its eating habits better. Then they would realize that the red fox does more to help than to hurt them.

The red fox is a prodigious eater of insects in the summertime, when they are abundant. The animal is even more notable for its skill as a mouse-catcher, and wherever there is a field or broken woods there are enough mice to support a normal fox population, with an occasional feast on a rabbit. Red foxes eat all sorts of rodents, as well as carrion, grass, and fruit. One may object, but no one can blame a fox for taking a nice fat hen, put almost under its nose—especially when there is a family of hungry little mouths to feed.

Like other members of the wild dog family, the fox is a good father. Foxes mate and live together for an entire breeding season. The family does not break up until the young are old enough to forage for themselves.

The den is often a hole underground,

## Grey Fox

in loose soil, for foxes are not good diggers. Sometimes they choose the abandoned shelter of some other animal, and renovate it. The cubs—there are four to ten in a litter—are born in March or April, fifty-one days after the mating period. They cannot see until a week has passed. Five weeks later they are out in the sunshine, playing together like kittens.

The red fox uses the den only as a nursery. Once the cubs have come of age and can forage for themselves, nothing short of imminent death would drive a red fox underground—and that only after it had exhausted every effort to elude its pursuer on the surface. The red fox sleeps out even during the bitter-cold winter nights in the north country of Canada.

In Europe and in the United States, hunting the fox has been a favourite sport for hundreds of years. When pursued by a pack of hounds, a fox will lope along at about six miles an hour. If the hounds get too close, it can speed up to forty-five miles an hour, but it cannot hold this pace for more than a mile or so.

For its survival the fox depends not so much on speed as on artful manoeuvres. Foxes have hidden in chimneys and even kitchen stoves as a last resort. On one occasion a hard-pressed Reynard sought refuge in a woman's arms; another retreated to the sanctuary of a church during the mid-morning service.

Nor should you think that these resources are all that this cunning animal has in its bag of tricks. One of its wiles for evading the hounds is to backtrack its own footsteps for some distance, then leap away to one side and make off in a new direction. Other ruses are: running along the top of a rail fence or a stone wall; running through a shallow brook to make the hounds lose the scent; crossing ice—so we are told—just thick enough to hold it but not strong enough to bear the weight

of the pack. No wonder the fox has been admired through the ages for its cunning! The fox is a past master at eluding its human or animal enemies, and it is usually only the young and inexperienced foxes that get caught.

With its large, erect ears, pointed face, and red coat, the typical red fox is familiar to all of us at least in picture form. It is by far the most colourful and jaunty of the foxes. Its long, bushy tail is by far the finest "brush" in the whole mammal world—it helps keep the animal warm when sleeping—and has a handsome white tip. The coat is not just red but more like burnished gold, and its legs and feet are almost black.

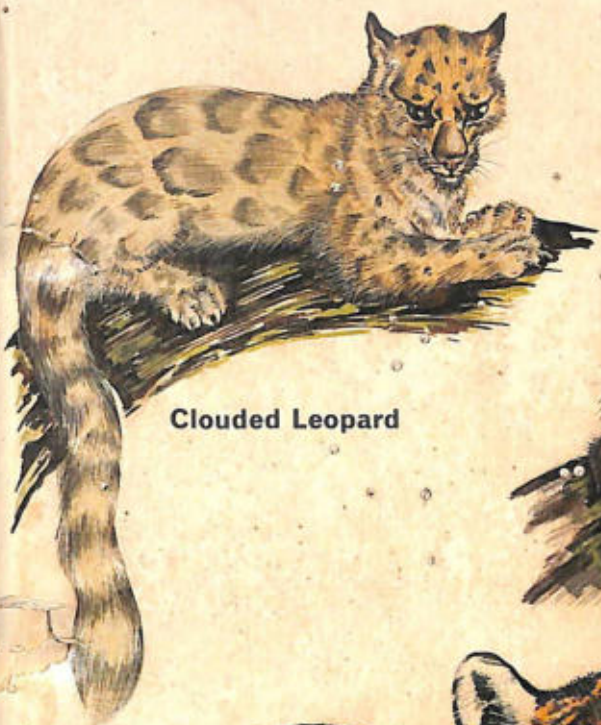
The red fox is much smaller than the wolf, with which it does not interbreed. A large fox stands sixteen inches at the shoulder. Its head and body length is about thirty inches, and the tail seventeen inches or more.

The red fox is not always red; sometimes it is a black fox, a silver fox, or a cross fox (this type has a dark cross on its back). But all three are colour variations of the red fox, and may turn up in one litter of cubs. The platinum fox is a domesticated strain recently developed from the silver fox.

The general range of the red fox covers most of the United States, Canada, Alaska (except the extreme north), Europe, Asia (from southern China to Siberia), and the arid regions of North Africa.

**The Grey Fox**, *Urocyon*, is the only fox that can actually climb trees. If the branches are low enough, it will go up by leaps from one branch to another. If the tree is tall and straight, with no low branches, the grey fox will grab hold of the trunk with its limbs and clamber up with the aid of its claws.

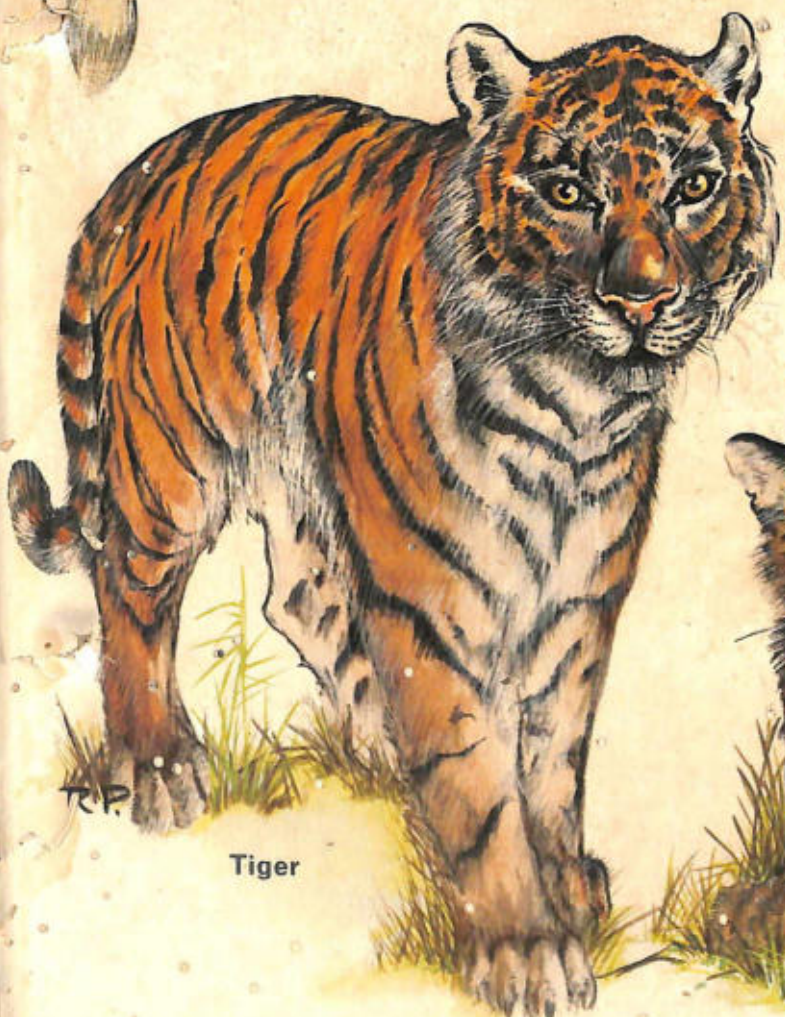
Sometimes the fox's reason for climbing



Clouded Leopard



Puma



Tiger



Jaguar

T.P.

is to get away from enemies such as dogs. At other times the animal may simply indulge a whim to crawl into the crotch of a tree and sleep in the warm sunshine. You may be sure the fox would not scorn eggs in a bird's nest if it found one in a tree.

The grey fox's tree-climbing ability often saves its life, for it is not a fast runner. Its top speed scarcely exceeds twenty-five miles an hour—and this for only the first hundred yards or so. Thereafter twenty miles an hour is the best it can do. Chased by hounds, it will quickly seek shelter in a nearby rocky den, or, failing this, will go up a tree.

A hunter as well as hunted, the grey fox feeds on much the same kind of fare as the red fox: moles, rabbits, mice, birds, lizards, shellfish, and insects—as well as fruit. If it finds an opportunity to make off with a chicken, that chicken's doom is sealed.

Young livestock tempts the grey fox, too. It is reported to have a special taste for the liver of a lamb because it sometimes opens up the lamb, breaks off the liver, and departs with it.

The grey fox is sometimes heard at nightfall. Its bark is short, harsh, and deep. The animal is most active after sundown. The rest of its time it passes in a permanent den it has made in a hollow tree or in a hole in sandy ground. It may also dwell in a cavern among rocks. Occasionally it happens that there are many dens in an area, and the foxes haunt them year after year. The den is lined with shredded bark or leaves for warmth and comfort.

The grey fox mates in early spring in northern localities, in January or February further south. The male shows a keen interest in domestic affairs. When the blind and helpless young are born about two months after mating has taken place,

he forages for food while the mother stays home to nurse the pups.

The fox family may consist of four or five pups, rarely more, and occasionally fewer. The parents take care of them until they reach the age of five months, when a young fox generally considers itself ready to go out and get its own living.

A native of North America, the grey fox has no close relatives in the Old World, South America, or Canada. It ranges from the Canadian border south to the Canal Zone. Though more plentiful in the sunny South than in the cooler regions near Canada, the grey fox sticks to timber: where there are no trees, there are no grey foxes.

Typically foxlike in appearance, this wild dog has a fairly long muzzle, erect ears, and a long, bushy tail. The "pepper-and-salt" grey fur, however, is rather coarse, and a mane of stiff hairs is concealed on the tail. The pupil of the eye is elliptical—a departure from the slitlike pupil of other foxes. An adult may weigh between seven and eleven pounds. The head and body length is about thirty-one inches, and the tail eleven inches.

## Other Foxes and Foxlike Wild Dogs

Though, as we have seen, the fox has been considered the symbol of cunning through the ages, not all of its kind live up to this reputation. Desert foxes of western North America, the **Kit Fox**, *Vulpes velox*, and the **Swift Fox**, *Vulpes macrotus*, are surprisingly trusting creatures. Unsuspicious by nature, they are easily caught in traps that would not fool a red fox for one minute.

Both these little foxes excel other desert animals in their power of great speed,

## Fennec Fox

and in making an escape will certainly practice deception. Alarmed, the kit fox makes off across the sandy waste with a remarkably sudden burst of speed. After darting off in one direction, it instantly—without checking its speed—shoots off at a sharp angle, completely bewildering any would-be pursuer.

The name "kit" hints at this animal's small size; but its ears are enormous, and so it is also known as the "big-eared fox." Smaller ears distinguish the swift fox from the kit, but both are grey and either will weigh about four or five pounds and have an over-all length of two or three feet.

These little foxes hunt at night, and are mouse- and rat-catchers. They make their homes in holes in the ground and live too far away from human habitations to molest chicken farms.

**The Chama**, *Vulpes chama*, the desert fox of South Africa, is also known to the Boers as the Oraai and as the **Silver Jackal**. Because of its grey back, the fur trade calls it the **Silver-backed Fox**. In a superficial way it resembles the **African Long-eared Fox**, *Otocyon*, which belongs to an entirely different species.

The African long-eared fox, an attractive little creature with a blackish glossy coat, is a familiar figure to hunters and travellers who cross the plains of Africa from the Cape of Good Hope to Ethiopia. It is a sociable animal, and travels in pairs, or parties of three or four, in quest of termites and other insects as well as any small rodents it can catch.

This animal has a most extraordinary habit of doubling back on its tracks. Even when released by a hunter, it does not directly make off for safety—as if controlled by some secret command, it doubles back on its own tracks quite frequently as it runs away.



### Fennec Fox

**A nocturnal animal that is fairly gregarious and makes its home only in true desert regions.**

We know that most foxes have big ears, but those of the **Fennec Fox**, *Fennecus*, are enormous. This little sandy-coloured fox has a length of only sixteen inches from the tip of its pointed nose to the root of its bushy tail—yet its ears are more than four inches long. Big ears, we have observed, are associated with a hot, dry climate, and appropriately enough the fennec fox is at home on the Sahara, the greatest and driest of all deserts.

On the steppes of central Asia there is another little desert fox—the **Corsac Fox**, *Cynalopex*, a catcher of rats and mice. This reddish-brown creature migrates with the seasons, often travelling in considerable numbers.

An Ethiopian red dog better known as the **Simenian Fox**, *Simenia*, is neither fox nor wolf, but combines some features of both, being almost as large as a wolf and having the pointed face and large ears of a fox. This golden, russet-coloured fox feeds on locusts and small rodents that it finds on the high plateau regions of Ethiopia.

In north-eastern Asia, the **Raccoon Dog**, *Nyctereutes*, is not only raccoon-like in appearance but in its habits, too. It

frequents the brushland along water-courses and feeds on fresh-water crustaceans, frogs, and small rodents. The Chinese name for it is *t'u kow*, meaning "ground dog"—the Chinese dig it out of holes in the ground. Large numbers of pelts are sold for fur in the Chinese markets.

**Wild Dogs of South America.** Perhaps due to inexperience, the South American foxlike wild dogs show little fear of man. When the first settlers arrived on the Falkland Islands, the so-called **Antarctic "Wolf,"** *Dusicyon australis*, was so tame and unsuspecting that in a few years it was exterminated in the islands.

Charles Darwin, in his diary of his voyage around the world in the *Beagle*, tells of seeing one of these dogs sitting on some rocks near the southern end of Chiloé Island. The animal was so absorbed in watching the work of two surveying officers that Darwin was able to walk quietly up and knock the animal on the head with his geology hammer. "This fox," said the famous scholar, "more curious or more scientific, but less wise than the generality of his brethren, is now mounted in the museum of the

Zoological Society."

The largest of the South American dog foxes, the **Andean Wolf** or **Culpeo**, *Pseudalopex*, is a greyish foxlike animal. It has some bright tawny colour on the legs and pelt. The name "culpeo" is a Chilean word signifying "madness" or "folly," and is aptly applied to the conduct of this animal, which constantly offers itself as an easy target to hunters.

Some of the old shepherds of Argentina and Chile still recall the days when the **Pampas Fox** or **Chilla**, *Cercocyon griseus*, a small grey dog fox, was seen dozens at a time. Large numbers of these animals would surround the shepherds' camp at night, pilfering and marauding at every opportunity. It was not unusual for a thousand of the skins of these foxes to be brought to market. Relatively speaking, not many of the creatures are left today. The **Savanna Fox**, *Cercocyon thous*, is larger and darker than the pampas fox and frequents the upland grassy plains of north-western South America.

Strange in appearance—it looks like an oversized stilt-legged toy dog—is the **Red or Maned "Wolf,"** *Chrysocyon*, which ranges in the open brushlands of Brazil, Paraguay, and neighbouring countries. It is almost as large as a timber wolf but in other respects suggests a fox. The slender head and long neck make the short body seem curiously dwarfed. Its large erect ears seem out of proportion with the comparatively short tail and only add to its odd appearance.

The Guara or Aguará-guazú, as this red wolf is locally known, feeds on rodents, birds, and some fruits. It is large enough to kill sheep, and hunts them alone, not in packs.

**The Bush Dog**, *Speothos*, is another interesting tropical American species. We can scarcely recognize it as a member



**Maned "Wolf"**

**An unusual canine with very long legs.**

## Dhole

of the dog family—it is rather like a badger but not quite so heavily built. The longish body with its short legs and short tail is black, while the large head, shoulders, and small ears are yellowish white or buff coloured.

This little bush dog is not over twenty-five inches long and lives in holes on river banks in Venezuela, Brazil, and Colombia. It feeds on anything it can catch and kill. It is a favourite with the natives, who take the pups and raise them as household pets.

**Dholes**, *Cuon javanicus*. A very distinctive red coat flashes through the underbrush deep in one of India's great forests. Another and still another appears and fades silently until a whole pack of colourful red hunting dogs known as dholes have passed on the heels of a fleeing sambar deer. They have been trailing their quarry by scent—now they are pursuing it by sight. There is no violent outburst of speed, but with a steady, tireless trot the wild pack gradually close in on their quarry.

In an endeavour to shake its pursuers off the trail, the stag heads for heavy cover. The veteran leader dhole follows close behind and keeps the pack together by giving short directive yaps.

Brought to bay with its back against a big tree or a rock, the stag sells its life dearly. The dogs, now in a circle, attack from all sides and many an overbold dhole meets a horrible death impaled on the slashing horns of the stag and flung in a lifeless heap among its fellows. The more experienced are cautious and wait for the unguarded fraction of a second when the lead dog springs at the quarry's throat. Then, as if at a given signal, the whole pack leap in and finish the stag.

The speedy dhole is much like a red-coated wolf. Weighing about forty pounds,

it has a head and body length of some thirty inches plus a fourteen-inch tail. Yet it is not a true dog—unlike other dogs, it lacks the last molar tooth in the lower jaw.

**The African or Cape Hunting Dog**, *Lycan*, is the terror of the bush country south of the Sahara Desert. It has been outlawed for its depredations. Hunting in packs of fifteen to sixty or more individuals, the wolf-like Cape hunting dogs usually prey on the smaller varieties of antelope but will run down and kill such big game as hartebeest and sable antelope.

The appearance of a pack of hunting dogs in the distance is a signal for all game to move out. Any animal that lags behind because of old age or sickness is devoured by the pack in short order. The hungry packs themselves travel great distances and are continually on the move. They pass from one region to another with few stops of more than a day's duration. After a while they come back to the same region, to ravage it again.

Cape hunting dogs are expert swimmers. Still, they decline to cross deep water, perhaps because they are afraid of crocodiles. The antelopes seem to be aware of this foible on the part of their swift-footed enemies and take advantage of it when chased. Choosing to run the risk of getting caught by a lurking reptile rather than to be torn to pieces by the ferocious packs, they plunge into the safety of the waters.

Often the timid antelopes can hear the pack before they see them, for the hunting dogs communicate with each other as they move along, uttering a soft "h-ho." This clear, musical call is particularly noticeable at sunrise, when scattered members of a troop call to their comrades. The hunting dog has two other cries: a



Cape  
Hunting  
Dog

sharp angry bark of surprise and a chattering noise something like that of a monkey, usually uttered at night.

When breeding time comes—about March—the packs break up and their members retire briefly to devote themselves to the business of carrying on the race. They select a number of abandoned aardvark dens, safely surrounded by brush and conveniently close to water. They clean out the underground nests, enlarge them, and line them with dry grass for the expected family.

In this dog colony, the babies are born about two months after the time of mating. There may be two to six of them in a litter, and a number of females will bear their young in the same den. Partly digested food is regurgitated by the mother when the pups are old enough to eat it. They join the hunt early, setting up a shrill, piping cry as they dash along.

Why is the Cape hunting dog known to naturalists as *Lycaon*? In the mythology of the Greeks, there was a king with this name. The god Zeus visited him in human form, and Lycaon, wishing to test his visitor's divinity, placed before him a dish of human flesh. To punish Lycaon for

this misdeed, Zeus transformed him into a wolf.

The Cape hunting dog has many of the ways of the wolf. It is a strong, husky animal about the size of a small wolf (four feet overall), with long legs, a big head, powerful jaws, and a fairly long, bushy tail. Its close, coarse hair is tortoiseshell in colour, and more or less irregularly blotched with patches of yellow, black, and white. Sometimes the animal is completely black. The ears, large and oval, remind us of the hyena's, and this wild dog is indeed sometimes called the "hyena dog."

Lions are the greatest natural enemies of these dogs. A whole pack will flee in mortal terror before a pride of lions. They should have learned to dread man, but they are more curious than fearful when he is near. Their curiosity is their undoing, and they present an easy target for a rifle shot. They are not known to attack people, however.

Hunting dogs may live for nine or ten years. Like the wolves, they have disappeared from populated areas, being found nowadays only in the more remote, unsettled parts of Africa.

## Carnivores: 2

# The Bears

It is one of Nature's oddities that the bear—the biggest of the carnivores—eats less flesh than its smaller relatives, the wolf and the fox. Even the great Kodiak bear, a rough brown giant that is nine feet long from tip to tail and weighs upwards of sixteen hundred pounds, will graze like a cow!

Bears will eat meat when opportunity offers, but most of them are not habitual hunters. Except for the polar bear, they feed on almost anything that happens to be available—grasses, roots, insects, ants, eggs, mice, nuts, and fruits, as well as fish and game. These massive carnivores simply have moved away from a total flesh diet. They could win it back if they had to—heavily built and powerful, bears are for their size among the strongest of animals. So mighty are they that they can hold their own against any natural foe. Rarely do they feel the need to seek safety in flight.

Even at a good distance you can readily recognize a bear by its lumbering gait. Bears are flat-footed and put the whole sole of the foot on the ground when they walk. Though normally slow-moving, they can hustle along in a lumbering gallop if need be. But the bears are walkers rather than runners. Most can climb, but some are too big and heavy to go up a tree. All are good swimmers; the polar bear is particularly well equipped for long periods in the water.

There are a surprising number of different kinds of bears. We place these animals in the family Ursidae. They all have a thick, warm coat of hair, rounded ears, strong claws that cannot be drawn

back, and a mere stump of a tail. Most bears are black, but brownish shades are quite common. The white fur of the polar bear is the exception. Bears have poor eyesight and only fair hearing, but a remarkably good sense of smell. Their nose tells them where food is to be had and when the weather is going to change.

Bears are creatures of the Northern Hemisphere; we find only one, the spectacled bear, south of the Equator today, and none in Africa or Australia. Most dwell in north-western North America and north-eastern Asia. In these two parts of the world live the biggest bears. Up the rivers in these regions millions of salmon come every year to spawn. Their life cycle complete, they die and are devoured by the great bears. There is no doubt but that the bears gather to eat the dead and dying salmon; and their large size may be due, at least in part, to this rich diet.

Wintertime sleepers, the bears go into their dens in the autumn, when they are quite fat, and do not emerge until early spring. As a rule they go without food for several days before turning in for the winter; and when they come out in the spring they first have a long drink of cool water and then feed sparingly.

Although a bear may sleep soundly through the winter, it does not hibernate in the strict scientific sense of the word. Its body temperature remains nearly normal, and the animal occasionally rouses and comes out of the den on mild days in midwinter. With true hibernators, like the woodchuck, the sleep is a profound lethargy; the body temperature is only a few degrees higher than that of the

air.

It is during the winter sleep that the cubs are born. Twins are usual in the bear world, but the rule is not a hard-and-fast one. At birth the young are very small; a two-hundred-pound she-bear may have twins that weigh no more than six to twelve ounces each. The cubs grow fast. Their mother lavishes care and affection on them during their baby period, providing for their needs and looking out for their safety. When they are tired they may even ride on her back. The author knows of a case of four little cubs that were playing about their mother when she took it into her mind to start off and climb a steep hillside. One of the cubs, more tired from playing than the rest, scrambled up to a point of vantage on some rocks and then hopped onto her back. The little fellow

rode off in style, hanging on with his paws embedded in his mother's fur. The others in the family trailed along behind.

Unlike the normal mother bear, the father shows no interest in his family whatsoever—the Story of the Three Bears notwithstanding. He seems a changed fellow from the bear he was earlier, in the courting season. During courtship, bears show great affection for their mates. They often stand up and fondly hug and paw each other. All this is most pleasant while it lasts—but the period is short lived. In one month, the prospective parents have lost all interest in each other.

For the next two years the female is quite indifferent to the opposite sex and concentrates on making a living for herself and her family. As for the male, he goes off by himself or seeks the companionship of his cronies.

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## Black Bears

**The American Black Bear**, *Euarctos*, may seem a friendly fellow to you in a zoo, but it is usually shy in the wild; there it moves off when man moves in. Although the black bear is afraid of people, it has an overwhelming interest in their belongings, particularly edible ones. It is a habitual camp robber. The animal is apt to make its first raid late at night. If the raid is profitable, more forays are sure to follow. With each visit the bear takes heart and advances the hour of its call. If you are camping out in bear country, you must not be surprised to see your erstwhile nightly marauder finally come marching boldly into camp in broad daylight!

The black bear is a good climber. Hugging a tree with its strong arms, it goes up paw over paw and backs down the same way. Just why this animal spends so much of its time climbing is a

puzzle. There is little up in the tree to attract it, and it has no natural enemies to fear on the ground. Perhaps it is fondly hoping to find a nest of bees.

Black bears mate only once in two years. The courtship takes place during the warm summer days, and there is a considerable display of affection between the sexes.

Having feasted through the harvest season and become extremely fat, the black bear turns drowsy when the weather gets cold. Now it is time to hunt for a winter den and prepare for the long sleep. A careful, tidy bear will clean out a cavity in a pile of rocks, or dig a hole in the ground if need be. Others less enterprising will curl up behind a wind-fall or in dense foliage and spend an unpleasant winter trying to keep warm.

In January or February, while the female is still in the sleepy stage, the den

## Black Bears

is suddenly transformed into a nursery. A good seven months have elapsed since mating time. One baby generally makes up the first litter, but later twins are the rule, with occasional triplets and, rarely, quadruplets. However, we know of the case of a female that was seen with five cubs. Perhaps she had adopted one or more into her family—it is not unusual for a mother bear to accept stray or lost baby bears.

The newborn cubs are a far cry from the two- or three-hundred-pounders they will be some day. Only about nine inches long, they weigh between six and ten or twelve ounces each. They could not long survive on their own: they are unfurred, blind, without teeth. For forty days and nights the young do nothing but sleep, feed, and snuggle up to their slumbering mother.

When the cubs weigh about four pounds apiece, they are big enough to take a look at the outside world: Rather unsteady on their legs at first, they soon learn to walk and scamper about. At the first sign of danger the mother sends her cubs scurrying up the nearest tree.

The cubs grow rapidly. Still, they are not mature until two years old. A female takes even longer to come of age. She is usually three years old when she has her first cub. Once it has left its den in the spring, a bear does not return to it, at least not until the autumn, but lives and sleeps in the open.

Day or night matters little to the black bear. Very irregular in its habits, it prowls about at all hours. It can swim well and will cross swift, broad rivers or a lake five miles wide. On land the black bear can move at a good, steady pace. In fact, it can race along at twenty-five miles an hour, if need be. But such bursts of speed do not last long.

By no means among the largest of the

bear clan, the black bear reaches a top length of six and a half feet. A female is generally a good deal smaller; she may be four and a half feet long. When full grown, the black bear has a shoulder height of two or three feet and usually weighs between two hundred and three hundred pounds. If exceptionally large, it may weigh up to five hundred pounds. The animal has a rather long, thick coat, usually black but sometimes rusty brown. As a rule, the muzzle is brownish, and a white spot of variable size marks the chest.

Twenty-five years is a good life span for the black bear.

We find the **American Black Bear**, *Euarctos americanus*, and ten related species in many of the wooded areas of North America including the plateau region of Mexico. All the variously coloured members of the *Euarctos* group—the name means “typical bear”—are merely local variants of the black bear. For example, the Cinnamon Bear is cinnamon coloured but in other respects resembles the common black bear.

There is even a white black bear! It lives on Gribble Island and the larger coastal islands of western British Columbia. Called the **Island White Bear** or **Kermode's Bear**, *Euarctos kermodei*, it sometimes has clear, creamy white fur, with no traces of any dark colour. Even the claws are white. Its eyes are brown, and so it does not appear to be a true case of albinism.

Equally curious is the **Blue or Glacier Bear**, *Euarctos emmonsii*, of the St. Elias Alps, in southern Alaska. This small bear is bluish black in colour. Grey hairs mixed with the black produce the blue effect. It is interesting to note, by the way, that the Indians avoid this animal. They believe it is possessed with the spirit of the shaman, and they consider it a medicine man among the animals.

## Grizzly Bear

**The Grizzly Bear, or Silvertip,** *Ursus horribilis*, was in the early pioneer days the undisputed master of the American Northwest. Every creature knew better than to dispute its claim to the right of way. One stroke of the grizzly's great jaw will break the neck of an ox or the back of an elk. The grizzly, however, soon learned that its might was no match for the bullet from a high-powered rifle; today it takes the back road when man comes along.

Once, like the bison, the grizzly was strong in numbers. At least seven different types are said to have dwelled in California alone. Although Californians continue to call the grizzly their official state mammal, today we cannot even find it in their state at all. Its great range, which formerly stretched from northern Alaska to central Mexico, and eastward across the plains as far as Kansas, has shrunk sadly. The grizzly still exists in fair numbers from British Columbia to Alaska, but in the United States it has practically disappeared. About five hundred grizzlies linger on in the security of the national parks.

The grizzly got its name for an obvious reason—its fur is grizzled. Generally its colour is dark brown, and the long hair of the back is heavily tipped with white. Thus it looks streaked or mixed with grey. Some grizzlies are yellowish, however.

Although the grizzly is smaller than the Alaska brown bear, it is still a large, powerful animal. An average grizzly weighs five hundred pounds—exceptional ones weigh up to 750 pounds. It is from six to eight feet long, with its tail a mere two inches or so. At the shoulder the animal stands from three feet to nearly four. The grizzly has, over the shoulders, a distinct hump. Its form is massive and robust. It has a sharply elevated forehead,

and its claws are long and curved. All of these special features help us to distinguish the grizzly from its smaller cousin, the black bear. The black bear recognizes these differences more quickly than we do; it moves off to another area, or up into the trees, when the grizzly lumbers into view.

In most of its habits, the grizzly often reminds us of the big brown bear. It never misses an opportunity to supplement its diet with good red meat. Ground squirrels are a favourite dish, though it takes some digging to get them.

Young grizzlies are good climbers. They can go up a tree like a black bear. However, they lose this ability as they get older, and most full-grown grizzlies are too big and heavy to climb. Large grizzlies have been seen in trees, but they are exceptions. This is one of the major differences between the black bear and the grizzly.

Twenty-five to thirty years is a good life span for the grizzly.

**European Brown Bear**  
Female with month-old cubs.



## Moon Bear

The **Moon Bear**, *Selenarctos*, gets its curious name from a broad, crescent-shaped white mark on the chest. The rest of the animal is uniformly jet black except for the brown muzzle. This Asiatic black bear is smaller than the American species—it has larger ears, and the hair on neck and shoulders is longer than on the rest of its body.

The moon bear's range spreads out from Iran to Indo-China and north to Manchuria.

The **Andean Black Bear or Spectacled Bear**, *Tremarctos*, is the only bear found in South America. It owes its name to the fawn-coloured ring that encircles each eye, giving a rather fanciful resemblance to eyeglasses. The jet-black coat is also varied to some extent by some brown or white about the muzzle and on the throat. This is a small bear—about two feet high at the shoulder and between three and four feet long. Close to a vegetarian in diet and a good climber, the spectacled bear goes up lofty trees for fruit and nuts. It roams the wooded foothills and forested mountain ranges from Colombia to Chile.



### Andean Black Bear

This is the only representative of the bear family found in South America.

## Brown Bears

The world's largest bears dwell along the narrow margin of coastal land that stretches from Alaska to British Columbia and the neighbouring islands. It is strange that these big brown bears, close kin to the grizzly, never wander inland very far beyond the influence of the salt-laden breezes that drift in from the sea.

The **Kodiak Bear**, *Ursus middendorffi*, is famous for its huge size. One of these yellowish-brown giants had a recorded weight of 1,656 pounds and measured nine feet in length. An animal this size would stand four and a half feet at the shoulder, and when erect on its hind legs could reach twelve feet in the air. Such a Goliath is, of course, exceptional in the wild, but some fat zoo animals weigh considerably more.

Despite their enormous size and great strength, the big brownies are not aggressive and rarely kill large game. However, a brown bear with her cubs is best given a wide berth; when wounded, this animal can be as treacherous as the most ferocious wild creature. The brown bears feed mostly on vegetable matter, especially in the spring, when they come out of their dens. At this time they graze like cattle in the northern meadows. Later on, they add roots, insects, and mice to their diet.

In June, when the salmon ascend the rivers to spawn, the brown bears are on hand to take their share of the annual feast. This is good timing all round, as the salmon die by the thousands after spawning, and the bears help keep the river free from pollution. This rich diet, as has been suggested earlier, may be the clue to the mystery of how the bears grow to their enormous size.

Perhaps you have heard the wonderful

## Malayan Sun Bear

story of how the brown bear does its fishing. Standing ankle deep on a sandbar or perched on a log, a brown bear will, with a lightning-quick stroke of a paw unerringly send a silvery twisting salmon up in the air to land high and dry on the bank. In a flash—almost before the fish comes to earth—the great, hairy brute is there to devour its catch. This is a good yarn, but observation does not support it. The bear catches the fish and eats it in the water.

Except for family groups, the big brownie travels alone. Since there is no night during the summer in its northern home, the bear is necessarily abroad by day. Active as the animal must be during the short summer to support its huge frame, it still takes time out to rest between nine at night and six in the morning. Sleeping, it usually lies concealed among the alders or stunted pines found above the timber line. (It is here the hunter looks for these animals, rather than among the tall trees.)

As you might expect, the family life of the big brownies pretty much follows the general pattern for bears. Family ties are strong and not easily broken among these huge bears. Cubs stay with their mother all the first year, and the whole family—except the father, of course—enters the winter den together. The second summer finds the cubs and mother still united, though the "babies" are now almost as big as she is. The young are on their own, but they continue to enjoy each other's company—until the brotherly bond is broken by the urge to seek a mate. The big brownies reach full maturity about the seventh year and probably live to the grand old age of twenty-five years.

**The European Brown Bear, *Ursus arctos*,** was once common throughout Europe and most of northern Asia. At

one time, as we have seen, bears roamed over Great Britain. Crowther's Bear, native to the Atlas Mountains, was the only bear ever found in Africa. There are at least a dozen kinds of Eurasian brown bears, ranging in colour from pale fawn to cinnamon and from blue to jet black. The Siberian Brown Bear is by far the largest—in fact, the largest flesh-eating animal of the Old World. It may weigh up to eight hundred pounds or more, almost equalling the great Alaskan brown bears in size. Like them, it feeds on the salmon that come up the rivers to spawn.

**The Manchurian Grizzly, *Ursus arctos lasiotus*,** is jet black and weighs up to six hundred pounds. Fierce and unreliable in disposition, it is one of the few species of bears that will make unprovoked attacks on man.

**The Syrian Brown Bear, *U. a. syriacus*,** is the bear of the Old Testament. It is the bear that was represented as coming out of the woods and avenging the insults hurled at Elisha—the bear which David fought and killed in defence of his flock. It is a rather light-brown bear averaging about three hundred pounds in weight.

**The Malayan Sun Bear, or Bruang, *Helarctos malayanus*,** is the smallest of the bears; some four feet long, it weighs about one hundred pounds. Its short close hair is glossy black with splashes of white or orange on the chest, and the muzzle is a greyish tan.

This bandy-legged tree-climbing little bear lives in southeastern Asia—the Malay Peninsula, Sumatra, Burma, and Borneo. It dines on almost anything edible. At home in the dense, damp jungles, the sun bear spends most of the day in the tops of tall trees, feeding on fruit and hunting for birds' nests. The

## Polar Bear

creature's mobile lips and the long, extendible tongue are well suited for picking up termites and grubs. Like all bears, it is fond of honey—hence the nickname "honey bear" is often applied to it. The animal pays no attention to the swarm of bees buzzing about its head; its close fur is sufficient protection against their stings.

A sun bear is easily tamed and makes an amusing household pet. However, with age it is likely to grow bad tempered and become dangerous. The peculiar name of this strange little animal seems to have come from the yellow crescent on its breast—it is supposed to represent the rising sun.

## Polar Bears

**The Polar Bear**, *Thalarctos maritimus*, is the swimmer of the bear family. Its scientific name means "sea bear," and sea bear it is—whether diving into the water and paddling, sometimes with its front legs, sometimes with all four, or else sailing out into deep waters on an ice floe.

This great white giant has been seen on ice floes more than two hundred miles from land, and has voyaged to Iceland and Greenland. On occasion it may travel as far south as the Gulf of St. Lawrence.

Food is what summonses the polar bear from its Arctic homeland, where it lives on the fringe of the northern seas. The most carnivorous of all the bears, it prefers to feed on seals and walrus cubs. (Not adult walruses—their tusks are effective protection.) Though a good swimmer, the polar bear has not attained the speed, grace, or agility of the seal in the water. However, the bear can and consistently does catch seals by stalking them on the ice. Its diet also includes caribou, foxes, birds, shellfish, and any

other available forms of animal life. It will not disdain seaweed. Often, on a great ice island, the Arctic fox will trail behind its huge northern neighbour, watching for a chance to gulp down the bear's leavings. In spring the bear goes inland to forage for grass and vegetable matter.

A dweller in frigid, snowstorm-wrapped regions, the polar bear is not too well known to us in the wild. And, likewise, the bear sees man as a stranger; it has not learned to fear him. Good-natured in the summer, when food is plentiful, the polar bear will not bother the passer-by. But come winter, the animal feels hunger gnawing at its bowels, and it will track a human being across the icy wastes the way it will any other game.

The polar bear is one of the largest carnivorous animals in the world, narrowly surpassed by the gigantic Kodiak brown bear. (In a sense it has a claim to the title of largest carnivore, since the brown bear is carnivorous in theory and not in practice.) Large male polar bears may reach a length of nine feet, stand five feet at the shoulder and weigh about sixteen hundred pounds. But the average male is more likely to weigh nine hundred pounds, and the average female seven hundred. This difference is the only marked one in the appearance of the sexes.

Although the polar bear is a massive, powerful animal, it is comparatively long and slender. Its head and neck are especially lengthy for a bear; its ears are short and rounded. Its coat of dense, long white fur is tinged with yellow from the bite of the brine. The polar bear's feet are heavily haired—one of nature's wise provisions for an animal that must walk on ice. It has better vision than most other bears and a sharp sense of smell—valuable traits for finding food in a lean season.

## Polar Bear

Surprising as it may seem to us, the polar bear does not retreat to a sheltered den in winter, though its home is in one of the coldest regions of the world. Only the pregnant female reverts to the typical bear habit of sleeping through the coldest months of the year. In the late autumn or early winter she finds a sheltered bank, digs down under the drifted snow, and curls up to sleep. Soon she is covered by wind-heaped snow. She does not so much hibernate as provide a safe receiving place for the babies that are to come. The sun, which for the last week has barely peeped above the horizon, now makes its final appearance, and the long, seemingly endless night hides the North in darkness.

With January—nine months after mating time—come the baby bears. Their eyes are closed, they are practically hairless and altogether helpless. They have a lot of growing to do, for at birth they weigh no more than two pounds, and

are a scant ten inches long. But soon soft, downy fur creeps over the little bodies, and at six weeks the babies finally open their eyes. When day breaks once more and the sunlight reaches long, bright fingers into the den in March, the cubs are ready to answer its beckoning. Now they begin to investigate the outside world, clumsily scrambling after their fond mother.

All through the first year the young stay with her, and she teaches them to hunt and care for themselves. When they are sixteen or seventeen months old—now they weigh a stalwart two hundred pounds or so—they are sent about their business, henceforth to be entirely on their own. The mother is ready to seek another mate and think about raising another family; she soon will have more mouths to feed, and her first brood's are big enough to offer a menace. At the age of thirty, the polar bear is well on in years.

### **Polar Bears**

**Photographed near Axel Heiberg Island, northern Canada, these polar bears are seen in typical natural surroundings, 800 miles inside the Arctic Circle.**



## Sloth Bears

**The Sloth Bear**, *Melursus*, moves along with a rather slow shuffle most of the time—there is no need to wonder how it came by its name! But let it come against a foe that is more than a match for it, and you will see how deceptive a name can be. The sloth bear will take to its heels and dash away across rough country faster than a man can race. It is a hard-hitting fighter, too, when occasion requires, and possesses a powerful armament of claws.

Ceylon and India are the home of the sloth bear. A rather rangy animal, about five feet long, it weighs two hundred pounds or so, stands over two feet at the shoulder. We may say it has a longer tail than most bears, but three inches is still not very long. Extremely lengthy black hair covers this bear, making it a shaggy oddity. On its chest there is a whitish crescent; its muzzle is whitish, too.

The sloth bear is a first-rate climber. It likes fruit and honey (*Melursus* means "honey bear"), and it will go up tall trees in search of these sweets of the

woodland. Coming down takes caution; the bear moves tail first toward the earth. On the ground, it finds a great variety of food. It will eat small rodents, grubs, beetles, sugar cane, or whatever else it can find to fill an empty stomach.

Termites are a dainty dish for the sloth bear; it has special equipment for capturing them. First it finds their nest, and digs them out. Then, with the help of its long, mobile lips, it sucks the scurrying victims into its mouth.

The sloth bear makes its den in a cave in the rocks. It generally keeps to itself, though sometimes there are small family groups, especially at breeding time. The young are born blind and remain so for about three weeks. Once they can see, they accompany their mother in her travels, often riding on her back and holding on to the thick tuft of hair on her shoulders. The cubs stay with their mother for two or three years, until they are almost full grown.

During babyhood the sloth bear makes an amusing pet, but it grows irritable and bad tempered with age. One sloth bear lived twenty-one years in a zoo; another, eighteen years.

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### Carnivores: 3

## Raccoons, Pandas, and their family

Most people will feel their curiosity aroused by the title of this section. Can the little raccoons of the New World and the great six-foot panda of Asia actually be relatives? Separated by the wide Pacific, these animals seem to be both geographically and physically remote from each other.

For a long time even the naturalists were deceived by the differences between

these two creatures. The experts used to consider the giant panda a bear. But careful study showed them that the panda shares so many basic features with the raccoon that it belongs to the same family. It has only one other relative in Asia, and this one is an oddity, too. It is called the lesser panda, and it is a small, catlike creature.

The rest of the raccoon family is strictly

American, ranging from the southern border of Canada all the way down to Paraguay. Many of us have never seen these animals or perhaps even heard of them. But although the names of the cacomistle, the coati, and the kinkajou may have a strange ring for our ears, people who dwell south of the Rio Grande know these alert and agile creatures well, often keeping them as house pets.

Although the raccoon's southern relatives differ in many ways, one thing they

have in common—long, bushy tails, which remind us of the cats'. Sometimes, too, the tails are marked with alternate rings of dark and pale colours, like the raccoons'. These animals walk on the soles of their five-toed feet, but they are not completely flat-footed. Unlike the cats, they cannot draw in their claws. The family name, *Procyonidae*, borrowed from the raccoon, means "before the dog," suggesting that this group is more primitive than the full-fledged canines.

## Raccoons

**The Raccoon**, *Procyon*, is at home about watercourses, lakes, and marshes. Here it hunts at night for other creatures that frequent water and its vicinity. A stout swimmer, the slender-fingered raccoon will reach out and catch fish, freshwater crayfish, frogs, salamanders, and mussels as it breaths a moonlit river or lake.

But the animal will pounce just as gladly upon eggs, birds, insects, mice, and every sort of creeping thing. It will dine upon nuts, fruits, and berries in season. When the corn on the cob is fat and juicy, the raccoon will make nightly raids until an alarmed and indignant farmer rounds it up with the aid of his 'coon dogs.

Quite singular is the "'coon's" habit of soaking its meat in water before eating it—an eccentricity that has earned the typical species the name of *lotor*, or "washer." No matter how clean a piece of flesh may be, if there is water nearby, the raccoon dips and thoroughly washes the meat.

The raccoon's fingers are long and extremely sensitive. In the process of washing, the animal never so much as glances at its busy hands, but looks around in an inquiring, detached manner as if it were capable of two separate

thoughts at one time.

The raccoon's dwelling place may be a hollow tree or a warm cavern among the rocks. Although this carnivore is a talented climber, often saving its life by taking refuge in the trees, it spends most of its waking hours on the ground. After a long summer's season of resting idly by day and prowling for food in the dark, the raccoon tucks itself comfortably away in its den and sleeps until spring. It awakens to mate and sometimes to feed.

Like the bear, the male coon solves his family problems by simply refusing to assume any responsibility. After a brief midwinter courtship, he returns to his solitary bachelor life.

In April or May, nine weeks after mating time, the baby coons arrive in their fluffy warm coats, marked just like the parents, with rings on their tails and a black facial mask. Three weeks later, their eyes open for the first time, but it is two months before they are big enough for their mother to take them on their first jaunt through the forest.

Like the female of the black bear, the mother raccoon pushes her tiny tots up the nearest tree when danger threatens. That precaution taken, she leads the would-be attacker an exhausting and

## Cacomistle

unsuccessful chase through marsh, mud, and swamp. If she gets cornered, she will put up a furious fight. Only when she knows there is no one behind her does she return to recover her family.

A raccoon is fully grown when twelve months old, but females may mate at ten months. Nine or ten years is the natural life span for a raccoon, but some have lived for thirteen years or a little longer in captivity. Raccoons are easy to tame if they are captured young. Because they are intelligent and playful by nature, they make delightful pets.

The "black mask" previously mentioned is one of the notable features by which you can recognize the raccoon. The mask runs across the eyes; below it, the muzzle is sharply pointed; above, the raccoon's long ears stand erect. The animal's brush of a tail may be ten inches long and on it rings of black and light buff alternate. Most of its body is covered with brownish-grey fur, but it may be more yellowish or even almost black. The fur is long and thick, giving the raccoon a sturdy appearance. About the size of a large house cat, it weighs fifteen pounds on an average. Still, there are "big" animals in almost every kind, and a large raccoon will come closer to fifty pounds.

While you are more likely to find the raccoon between the southern border of Canada and the Rio Grande, it ranges south through Mexico and Central America. A close relative, the **Crab-eating Raccoon**, dwells in South America. Although it resembles its northern cousin in a general way, it has shorter, coarser fur and a less bushy tail. It also spends less time in the trees. Some animals have a way of not living up to their names, and the diet of the crab-eating raccoon is by no means limited to crabs.

## The Cacomistle, or Ring-tailed Cat,

*Bassariscus*, is an attractive, furry little animal, like a cat in its build, like a marten in its looks. It has a sharp-pointed face, large ears, and great big eyes that seem full of feeling to us. A long, showy tail, marked with broad alternate rings of black and white, arches out gracefully behind the cacomistle, adding to the charm of its appearance.

In the wild, the ringtail haunts places where there are broken rocky outcrops, rock slides, and rimrock, a supply of clear running water and scattered pine trees. Here, it hunts down wood rats, ground squirrels, mice, lizards, and chipmunks, racing after them across the rocks with remarkable agility. Hair on the soles of its feet makes the going easier. Just as the ringtail must be fast to bring down its food, so it must be ready to dash off lest it end up in another animal's stomach. Owls and snakes appear to be its special enemies.

In many ways the ringtail's habits parallel those of the raccoon. The ringtail is at home in the trees as well as among the rocks and it is an adept climber. To



some extent it feeds on fruit. Sometimes the young are born in a hollow tree, sometimes in a cave. In May or early June, the female brings forth her litter of three or four "kittens." They are blind, toothless, and have a scant covering of down. At the end of the fourth week their eyes open.

Now and then the father takes a hand in bringing food for the family, but such paternal interest seems to be an individual peculiarity rather than the general practice. Raising the young is a mother's job in the world of ring-tailed cats.

An adult ringtail wears a handsome coat of fur. It is soft, pale yellowish-grey tipped with black. The animal's glory—its tail—is even longer than its body, which may be about fifteen inches. The ringtail stands only six inches at the shoulder—we said it is catlike—and a full-grown adult weighs close to two and a half pounds.

In Central America and Mexico, the ringtail has a cousin, the **Middle American Cacomistle**, *Jentinkia*, that lives in the trees of dense tropical forests and has darker-hued grey fur. ("Cacomistle," by the way, is the name the Aztecs gave the animals long ago.)

**The Coati**, *Nasua*, an odd-looking creature, is extremely rare north of the

Rio Grande.

What kind of creature is the coati? It belongs in the raccoon family and looks like a raccoon—only it is longer and has a projecting piglike snout which is rather flexible. That is why naturalists call it *Nasua* (from the Latin word for "nose"). The Tupi Indians of South America gave the coati its common name. They seem to have put together their words for "belt" and "nose" to christen it. We suppose they were referring to its comfortable habit of sleeping away the hot midday hours curled up, its snout snug against its belly, in the shade of the forest trees.

There are red coatis and there are brown coatis, and many are greyish brown. Some are more yellow or black. On the chin and throat, the fur fades to white. A mask of light brown proclaims the coati's membership in the robber band of the raccoons.

Another mark of kinship to the raccoon is the coati's long tail: it is striped with indistinct brown rings and is thinly furred. When the coati struts through the woodland, it carries the tail proudly behind it, pointing upward in a sharp curve. The larger species of coati may reach two feet in length, and the tail is almost as long. We find coatis that weigh as much as twenty pounds, but the run-of-the-woods member of the group is more likely to average ten.

Not so exclusively a night worker as the raccoon and the cacomistle, the coati picks its hunting hours for comfort. It likes morning and early evening best; the remaining hours it will laze away or sleep through.

This little fellow is fond of companionship and often travels in parties numbering from five to a dozen or more. Each member of the troop carries its tail aloft and pokes its long nose into every nook and corner in search of some lurking



#### Coati

Coatis, also called coatimundis, are found from Argentina to New Mexico.

## Kinkajou

insect or reptile. Whenever the group reaches a fruit-laden tree, they scramble up like a band of monkeys and climb out on the branches to devour the fruit.

The coati feeds on almost anything edible—mice, rats, insects, worms, fruits, and seeds. With coatis about, even a bird isn't safe in the trees—the animal may pounce on it or loot its nest. The coati is a staunch fighter, for it is well armed; it has long fangs with razor-sharp edges capable of inflicting fearful slashing cuts.

We know little about the breeding habits of the coati in the wild. One observer reports seeing a female that was carrying five young, quite hairless, early in September; and another female with four young in October. So we may assume that this is pretty much the time when baby coatis come into the world. We do know they are born about seventy-seven days after mating time.

## Kinkajous

**The Kinkajou, or "Honey Bear,"** *Potos*, is both a cousin and a neighbour of the coati. We find it in the tropics from southern Mexico to Mato Grosso in southern Brazil. The great oddity of this brown-furred little creature is the long, powerful tail. It is prehensile ("grasping"), like the tails of the tropical monkeys that share the forests with this southern kinsman of the raccoon. The animal can curl it to hold on to things and indeed uses it as a fifth hand.

So strong is this tail that the kinkajou can even swing suspended by it from the limb of a tree. It takes special delight in this stunt, performing it often.

Nothing can shake a kinkajou out of a tree. Not even a tornado can break its stranglehold with its tail aided by the firm grip of all four feet. The kinkajou is one of the few animals that can climb

up its own tail as you hold the end of that appendage, and then onto your hand.

This lithe creature travels monkey fashion through the trees of its forest home. Rarely does it descend to the ground. To get to its destination, it simply swings from tree to tree.

During the daylight hours, the kinkajou sleeps curled up in a ball, with its tail wrapped around its body, in thick foliage or inside a hollow tree. With the evening comes waking time and feeding time. Fruit seems to be the kinkajou's favourite food—especially wild figs, which are abundant in tropical America. It uses its long, extendible tongue to extract the pulpy centre.

When hungry and in a hurry, the kinkajou will grasp food with its hind feet as well as the fore feet, just as monkeys often do. With the amazing tail it can stretch out and clutch fruit beyond its normal reach, and bring the food to its hands or mouth. Occasionally, when feeding in the treetops, it utters a soft hiss or a short, low bark, but it is silent most of the time.

Two to four young are the rule. At birth they are about the size of newborn kittens and covered with short black fluffy fur. They open their eyes for the first time when they are about ten days old. Their tails do not show any prehensile strength for about a month. At the age of seven weeks, however, the little kinkajous are able to hang by their tails.

A grown-up kinkajou's tail is about twenty-two inches long—somewhat longer than its head and body together. Large eyes sparkle in its rounded catlike head. Its face is short and pointed, its ears small and round. It has short legs and its tail is soft and thick, and uniformly tawny or golden brown.

The Tupi Indians of South America appear to have also given the kinkajou

its name. Some tribes call it *potto*, from which naturalists derived the name for the genus. Strangely, the *potto* of Africa has the identical native name but is a lemur.

More like the kinkajou in its looks and habits is the **Olingo**, *Bassaricyon* ("fox-dog"), another member of the raccoon family that has sometimes been found feeding on fruit in the same tree with the kinkajou or travelling in its company. The olingo ranges from Ecuador to Nicaragua. It is a slightly smaller animal, but its golden-brown fur is longer and thicker. The tail is bushy and not prehensile.

## Pandas

**The Giant Panda**, *Ailuropoda*, is an uncommonly appealing animal that lives high up in the mountains of southwestern China and eastern Tibet. Here it haunts the almost impenetrable forests of bamboo. So dense and compact is this woodland that the trails the panda must follow are actually tunnels through the green. Along them stalk the black bear, the leopard, the takin, and the wild boar.

When you consider how remote and inaccessible the mountain fastnesses of China are, it does not seem odd that the western world never heard of the giant panda before 1869. Perhaps the first European to see the animal alive was J. H. Edgar, in 1916. In the wild country of the upper Yangtze, not far from Kinsha, Edgar beheld a large white animal curled up in a great ball, asleep in the forks of a high oak tree. It was the *beishung*, as the Chinese call it—the "white bear." Today, having studied it closely, we know the giant panda is not a bear but rather the biggest member of the raccoon family.

The giant panda certainly is bearlike in its size and its shape, right down to its

stumpy little tail. About six feet long, the animal may weigh two hundred pounds or more. A handsome and amusingly coloured creature, it almost seems designed for a child's delight. The giant panda is creamy white, but it wears black stockings on its legs, and a yoke of black runs over the shoulders. The great white head has small black ears perched atop it and a black patch covers each eye, making this a funny-looking fellow indeed.

Perhaps these colours serve a serious purpose, however. As the white-and-black animal moves across the snow where rocks crop out and the trees cast dark shadows, it is often lost against the background.

Like the bear, the big panda is flat-footed (naturalists say "plantigrade") and moves overland with a similar lumbering gait. Still, it is a good climber and agile in the trees. Its food seems to be almost exclusively bamboo shoots. In its homeland the young shoots continue to grow from June to September and are white within and excellent eating. In the winter there are bamboo leaves and stalks to chew. Because the animal is so big, naturalists estimate it must eat for ten hours a night to keep itself going.

For feeding on the fibrous bamboo, the panda has developed exceedingly large and broad molar teeth, with tremendous grinding and crushing power. Strong jaw muscles also help out. But the teeth still show us this animal is a carnivore, and suggest that the pandas of ages past were substantial eaters of flesh. Those of today may now and then dine on the smaller animals in the forests of China. In a zoo, when bamboo is not available, the panda will feed on vegetables, cereals, cod-liver oil, and milk, and seem none the worse for the change to another diet.

On each of its front paws the panda has a pad—the animal's scientific title, *Ailuro-*

## Lesser Panda

*poda*, means "cat feet." The panda can use these pads like thumbs in bringing food to its mouth. Such equipment is an oddity among the carnivores. Interesting indeed is the way the animal eats. Sometimes it uses both hands like a squirrel, or lies on its back, heaping a pile of food on its belly before starting a meal. It will hold a stalk of celery in its fist and bite off a mouthful at a time. It is much handier with its paws than a bear.

There are too many animals whose life history is almost a closed book to us, and the rare giant panda is one of them. We have every reason to believe it does not hibernate or sleep through the colder months of the year. Its cubs number one or two, and are born in the winter. They weigh only a few pounds at birth, but by the end of their first year may reach sixty pounds or more. Because the pandas keep to themselves and are shy, quiet creatures in the wild, seldom wandering far from their chosen haunts, it is hard to find out much about them.

**The Lesser Panda, or "Cat Bear,"** *Ailurus*, sits up on its hind legs and strikes out with its forepaws like a bear. It climbs the way a bear does and, when irritated, it makes the same sudden rush as the bear. It even emits the same kind of cry. But how different this little Oriental is from a bear!

The lesser panda (we must call it that to distinguish it from its big relative, the giant panda) is only about two feet long—roughly the size of a large house cat. Long, luxuriant fur, ruby red or deep chestnut in colour, covers its lithe body. The watchful face, in which two lustrous little eyes shine, is white, but a narrow dark stripe runs from the eyes to the corners of the mouth, adding to the animal's wistful charm.

Nearly straight out behind it the lesser



**Giant Panda**

panda carries a handsome bushy tail, about sixteen inches long and ringed with bands, alternately dark and light, that put us in mind of the raccoon. There are short claws at the end of its rather stubby legs. The animal can partly draw these claws in, so they are known as "semi-retractile." With its good looks and friendly manner, the lesser panda is one of the most attractive and appealing members of the animal kingdom, especially when it has settled in a zoo and become accustomed to people.

We find the lesser panda in the forest-clad Himalayas of northern India and in western China, at elevations of seven thousand to twelve thousand feet. Slow and awkward on the ground, the animal is a first-class climber and spends much of its time in the trees. Although it may eat some insects, mice, and other small animals, its food consists mostly of vegetable matter like bamboo shoots, leaves, and fruits. The lesser panda prefers to make its den in a hollow tree, where it bears one or two young in a litter.



Carnivores: 4

## The Weasel and its relations

Few animal families are more important to us than this colourful group. It contains some of our most valuable fur-bearers—the marten, the sable, the mink, and the otter. All are beasts of prey that render man great service by keeping in check the rodents, his rivals for possession of the earth.

The mustelids, as we call the members of this family (Mustelidae), include the smallest of all flesh-eaters, the stoat. Symbol of furtiveness, this little animal is nonetheless one of the most ferocious mammals on the face of the earth.

Members of the weasel family are found all over the world, except in New Guinea and the Australian region. Many, like the weasel, stay on the ground. But some, such as the marten, have climbed into the trees, while others—the badger is an example—burrow in the earth. A number are good swimmers: the mink and the otter hunt in and along the watercourses. All these carnivores are medium or small in size and the female is not so large as the male. They have scent-producing glands, though not always so effective as the skunk's.

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### Weasels

**The Stoat or Ermine**, *Mustela erminea*, is the most sought after of all the weasels because of the soft and luxurious white coat it wears in winter. In the summer, however, it looks like a different animal. Then its garb varies from yellowish brown to chocolate brown. But warm season or cold, it always wears a black tip to its tail.

The stoat only changes its brown summer coat to a white one in winter in the northern parts of its wide range. A long autumn without snow may retard the change, and early snows hasten it. Although the transformation is a rapid one, it is no overnight affair: it may take from ten days to three weeks. The ermine does not merely alter in the pigment or colour of its hair, but gradually sheds, or moults, the old coat, whereupon new, denser fur comes in. (This white phase, we shall see, is typical of the northern weasels in general, which are then loosely called

“ermine” in the New World.)

Once the change is made, the ermine remains white until the spring moult; then it changes back to the brown coat. When a spell of warm weather in mid-winter melts the snow and leaves the ground bare, the white weasel's camouflage is no longer a help, but a dangerous handicap. The animal continues to move about on top of the ground as if it were quite confident that its white body did not stand out in sharp contrast to the brown background.

In their turn the weasels (of which the stoat is typical) take an almost unbelievable toll of animal life. They are without exception the most bloodthirsty, relentless slayers among the smaller mammals. A stoat kills not only to eat, but it literally kills for the sake of killing. It destroys not just smaller animals and animals its own size, but also some that



### Long-tailed Weasel

The common species found throughout enormous ranges of the New World, shown at the moment of killing its prey.

are many times larger.

So fierce a creature must inevitably play a major part in controlling the great hordes of rodents in its homeland, the Northern Hemisphere. The ever-multiplying ranks of the despoilers and disease carriers, the rats and mice, would quickly overrun the earth were it not for the insatiable, tireless weasel.

The stoat and other northern weasels usually mate in July or August, but the babies do not come until the following March or April. The den, or nursery, is a hole in the ground or under a rock (the former rat or rabbit occupant having been slain by the new tenants). There are from six to twelve young in a litter (seven or eight is average). Since each baby consumes more than half its weight in food every day, it would hardly be possible for the mother to supply the family needs without the aid of the father. Not only do both parents take an active part in caring for the young; we sometimes find a year-round association of the male and female.

The baby stoat, like so many other carnivores, is blind at birth. It weighs under two grammes, is flesh coloured, and has a fine, downy covering of white hair. It does not open its eyes until about

thirty-five days have passed. In another week it goes on a meat diet, but remains under parental care until August. Highly-strung animals, continually on the move, and apparently indefatigable, the stoat reaches old age in seven or eight years.

We have suggested that the underlying reason for the remarkable whitening of the winter coat of the ermine (or, for that matter, of the weasels that we generally find in the northern part of the world) is protective colouration. These weasels are always white where snow lies deep on the ground all winter and every winter.

Where there is never, or rarely, any snow, stoats are brown in winter. The colour change, where there is one, is effected by a moult in the autumn and one in the spring, we have seen. But even the weasels that are brown in winter undergo the same two annual moults. These animals change coats, although not colours.

The change from a brown summer to a white winter coat is hereditary. A brown weasel—from an area where no seasonal changes in colour take place—if kept in the north where there is deep snow, would still be brown, winter after winter. If a white weasel (one born and raised

in the north) is transferred to the south where there is no snow, it will continue to turn white every winter. The change, we perceive, is a calendar routine; neither snow nor temperature is the direct cause.

Until recently, the mechanism of the colour changes was a mystery. Now we know they are actually determined by the amount of light. As the days get shorter in the autumn, the weasel receives less light through its eyes. This causes the pituitary gland to stop producing a substance known as gonadotropic hormones. The lack of these hormones deprives the hair cells of pigment, and the new hair growing under such conditions is, of course, white.

In the spring, the story is exactly the opposite. The nights get shorter. The increasing amount of light coming through the eyes of the weasel now stimulates the pituitary gland and increases the pigment in the hair cells, which gives colour to the hair in the spring moult.

A white weasel kept in a dark place would have a tendency to stay white through lack of light, but because of heredity would change to brown with the spring moult or white in the autumn.

**The Long-tailed Weasel**, *Mustela frenata*, is the common species of the weasel and the one we usually see in most parts of the United States, where it takes the place of the stoat; its range extends from the Great Lakes in Canada to Ecuador and Peru in South America.

This animal's typical colour is deep reddish-brown, grading to almost black. The tropical American weasel has on its face a white marking in the form of a bridle—"bridled weasel" is actually the meaning of its scientific name. Only in the northern part of its range does the long-tailed weasel turn white in winter. Then people often refer to it as an ermine,

though it is really another species.

The long-tailed weasel seems to prefer more open country than its shorter-tailed, more northern cousin. We find it in regions where there is an abundance of small animal life upon which it can feed. In search of food it may cover several miles in a single day, but usually it moves about in an area of not more than fifteen acres.

The American weasel's home life is like that of the other weasels. It lives in a shallow burrow in the ground. The den is usually some six inches or so below the surface and the nest chamber about ten or twelve inches in diameter. It provides a fine warm lining for the nest—chiefly the fur of its victims.

June or July is the mating season for the long-tailed weasels, as a rule. There is a period of delayed development of the embryos as with all weasels, and babies are born from 220 to 337 days after mating time. The weasel mother finds from four to eight young in her litter. They will average about three grammes each when a day old—no substantial weight when you consider that a cigarette weighs about a gramme. In two weeks they are clothed in a silky white coat.

By the time the young weasels open their eyes (on the thirty-sixth or thirty-seventh day) they are well on the road to maturity: these "babies" are weaned when five or six weeks old and full grown at ten weeks. Naturalists who have studied the long-tailed weasel closely claim that both parents work together in caring for the young, and this would indicate pairing for life.

The weight of full-grown males may reach six ounces, while the head and body generally span round about ten inches. The tail may measure close to six inches in length. Is that really long? Only in comparison with other weasels' tails, and

## Common Weasel

so we call this one the long-tailed weasel.

- There are many forms of long-tailed weasels, including the well-known New York Weasel, but all are subspecies of
- *Mustela frenata*. The bridled weasel is the one you are most likely to encounter in South and Central America.

**The Common Weasel, *Mustela nivalis*,** is a common animal in Europe, much of Asia, and N. Africa. This short-tailed weasel feeds primarily on mice; it may also climb low scrubbery to stalk birds. It has larders in crevices and holes in trees in which it stores food. One such storehouse was found to contain three wrens, one goldcrest, one chaffinch, one mouse, two pigeon heads, one pigeon leg, and other remains unidentifiable.

Those who know this beast well, have many anecdotes to relate concerning its tenaciousness, courage, and rapacity. For example, more than one dog has retrieved a rabbit to which a short-tailed weasel was still clinging, unwilling to loosen its hold on the prey's throat. On one occasion an English kestrel was seen to rise a good thirty feet in the air and let something drop; it turned out to be a dead rat with a weasel grimly hanging to it. Few records of dauntlessness can equal these.

The common weasel is sometimes called the short-tailed weasel, and its tail (which lacks the black tip characteristic of many other species) is only two and a half inches long; the rest of the animal may be eight inches. This weasel is small enough to enter underground burrows. It has turned up in the author's mole traps, caught as it travelled along the runways of the garden mole in search of prey.

The short-tailed weasel makes its home in Great Britain (where it is called a weasel, as opposed to a stoat or ermine), Europe, and Asia. We encounter related

forms in Egypt and on the islands of the Mediterranean. The short-tail has brown fur, but, like its long-tailed relatives in the New World, it will wear a white winter coat in the northern part of its range.

**The Least or Pygmy Weasel, *Mustela rixosa*,** is the smallest of the weasel tribe. It is only about eight inches long, and has a one-inch tail with hardly a trace of the usual black tip. In summer this little



### Common Weasel

**One of the more common weasels, this rapacious animal turns white in winter only in the northern parts of its range.**

fellow is a uniform reddish brown on the upper parts, and white below; in winter it is an unbroken white.

No wide-roaming hunter is the pygmy weasel. It has a maximum home range of about two acres and seldom travels far from its burrow in the ground. However, having cleared one area of mice, it moves on to another.

When the pygmy settles in a new locality, it selects a mouse's nest in some concealed place either on the surface or, more often, under ground. It immediately starts to line the nest with hair plucked from its victims. The pygmy will carry mice into the den and consume them there. Sometimes it will store them in connecting galleries.

The pygmy differs from its relatives in that it has no fixed breeding season. Its young may be born in any month of

the year, but spring and winter seem to be the commonest times. The average litter contains four or five babies; however, there may be up to ten.

The homeland of the pygmy is the northern regions of the earth. We find the animal spread across Europe and east as far as Siberia. In North America it is present from Alaska south to Nebraska and, in the eastern United States, in the Allegheny Mountains of Pennsylvania.

**The Kolinsky**, *Mustela siberica*, the large, yellow weasel found in most of Asia, is perhaps better known dyed and made up into a fur coat than as a wild animal. It got its name from Kola, a district in north-eastern Russia, where the best pelts come from. Kolinsky also goes under such names as Shantung, China mink, Japanese mink, and yellow mink. For the living animal the natives of northern China have the most picturesque name of all—they call it *huang shu lang*, meaning "yellow rat wolf."

The author caught a number of the big yellow weasels along the banks of frozen rivers in Siberia. He found them still active at temperatures 60 degrees below zero, and was surprised at their resemblance to mink in all respects except colour—even their habits were like the mink's. Although the fur lacks the luxuriant lustre of our true mink, the kolinsky is still an important item in the trade.

## Minks

**The Mink**, *Mustela lutreola* and *Mustela vison*, looks like a weasel, only one grown large and robust. It has the same long, supple body and short limbs. It has the same murderous habits, too, with even greater power and skill to exercise them.

This weasel-like creature can and does

hunt fish. With a normal swimming rate of some two miles an hour, it catches the wily trout in fast-running streams. It can swim faster under water than a muskrat but not so far or so deep. No matter—it catches the muskrat often enough.

The mink wreaks terrific havoc among marsh birds, and young snapping turtles also fall prey to it. Like the weasel, the mink is fond of rats, mice, and rabbits, which it hunts in the woods and bushes. Unlike the weasel, it does not seem to practice killing so much for the sheer joy of it.

The mink is chiefly active at night, but you may see it about at any hour of the day. It makes its home near water-courses, on the margin between the dry land and deep water. Here an individual's territory covers an area about five miles in diameter, over which the animal ranges for its food supply. Its lair is a hollow tree, a crevice in the rocks, or a burrow dug in a river bank.

Often this carnivorous creature will carry its kill home and eat it. A mink's lair is always littered with the bones and scales of its victims. Where there is good hunting and fishing, a whole week's supply of dead fish and animals may be cached in the mink's storehouse. In one mink's den, for example, thirteen muskrats and three waterfowl were found.

The mink mates in February and March. About six weeks later, the litter comes, with four to eight sightless, almost naked kittens in it. They open their eyes when five weeks old, and at about this time they begin to eat solid food. The father helps the mother to find it for them.

During their adolescent age the young are very playful—in a savage sort of way. Their games are mostly of the rough-house type: they spring and jump at each other, lose their tempers and squeal,

## Common Polecat

hiss, or growl angrily. As they grow older, they begin to fight and quarrel in earnest. Now, too, they are getting big and strong enough to earn their own keep, and they follow their mother and father on hunting trips.

For most of the summer, the family remains together, hunting or frolicking. With autumn comes an end and a beginning. Each of the minks goes its own way to find a new territory in which to settle. At this time of the year they often travel a considerable distance from water, cutting across from one watershed to another.

An adult mink (male) weighs about two pounds. It is about two feet long, and its rather bushy tail is roughly a third as long again. The soft, thick underfur is overlaid with long black glistening guard hairs, which protect the animal's coat when there is swimming to be done. It may have white spots on its chin and throat. The female is smaller, but has the same colouring.

The mink is found over nearly all of North America from the Gulf of Mexico to the Arctic, and in the Old World from north-eastern Asia to Finland and from south-western France to eastern Rumania. There are a number of different geo-

graphical forms but only two living species: the **American Mink**, *Mustela vison*, and the **European Mink**, *Mustela lutreola*.

A larger species, the **Sea Mink**, *Mustela macrodon*, used to be found along the coast of Maine and the adjoining Canadian seashore, but it died out about one hundred years ago. Today the only relics of this animal are fragments of skulls from the Indian shell heaps at Brookline in the State of Maine.

## Polecats and Ferrets

**The Common Polecat or Fitch**, *Mustela putorius*, is the only member of the weasel family that has been truly domesticated. This famous animal is about the size of a domestic cat, with a bushy tail. The beautiful soft fur is uniformly buffy grey in colour, overshadowed with black-tipped hairs.

There seems to be some question, as to where the polecat got its name. It could be just plain "Polish cat" but more likely it was derived from the Gaelic for "pool cat," signifying a cat that lives in a hole in the ground. The French word *poule*—it means "fowl" or "hen"—is another possibility, as the polecat is noted for robbing chicken pens.

The popular word "polecat," signifying an evil-smelling animal, originated with this animal, but formerly the name had no such meaning. The American skunk is sometimes called a polecat because of its odour.

The polecat is a good housekeeper. Its den is usually a hole in a well-drained dry bank or among the rocks. There is an outside toilet, a warm nest chamber (the polecate loves comfort) and a connecting runway that leads to the larder, which is kept well stocked with good things to eat. Here one may find birds, rats, rabbits,



Mink

and reptiles. In one polecat's pantry were found fifty frogs and toads; all were alive, but each had been bitten through the brain and thus rendered helpless.

March and April is the time for courting, and both parents take an active interest in the family that comes forty days later. The kittens are born like so many other young animals—naked, without sight, and quite dependent. They open their eyes for the first time twenty-one days later.

Baby polecats make their first appearance in the outside world when six weeks old. They love to sport and play, and in the warm sunshine they dance around each other in a most amusing manner. At the first sign of danger, however, the little playfellows dive for home after colliding with, and falling over, each other in their terrified scramble to get safely underground. The life span of these animals is nine or ten years.

The polecat is at home in semi-wooded and open country in Europe, from Great Britain east to Siberia and Mongolia and south to the Himalayas. In North Africa it makes its home in the mountains of the western Rif, in Morocco.

**The Domesticated Polecat or Common Ferret, *Mustela furo*,** is well known in Europe but has scarcely been heard of in America. Because they possess long, slender bodies and a keen desire to kill, ferrets are used to drive rabbits and rats out of their holes so that they can be shot, or killed by dogs.

Ferretting has been a popular sport in Europe for several centuries, but it was practiced in Asia as early as the first century before Christ. The ancient tribes of that continent selected the smaller wild species, *Mustela eversmanni*, for their purpose. It has since been crossed with the larger European polecat, but in the



### Common Polecat

**This is a large, long-haired species,**

selective breeding of ferrets, the smaller polecats are used. Ferreting was also a common sport with the Romans. Strabo states that ferrets were originally brought from Africa to Spain; Pliny was familiar with the sport in his day and refers to it as being practiced in hunting rabbits.

**The Black-footed Ferret, *Mustela nigripes*,** resembles the ferret and the polecat in size and general appearance, yet in reality is an entirely different animal. This big, yellowish-buff weasel with the black feet is at home on the Great Plains and prairies of the United States, from North Dakota and Montana south to Texas, the region originally covered by the prairie dog towns. Since the dogs, its chief source of food, have all but disappeared on the western plains, the black-footed ferret is on the road to extinction.

In the Gobi Desert and the steppe country west to Rumania and Hungary dwells a very ornate little polecat, the **Marbled Polecat, *Vormela*.** The Afghans' name for it is "gorkhus" or "grave-digger," because they believe it frequents burial grounds. It is about thirteen inches long, plus a seven-inch tail, and is capable of emitting a disagreeable odour.

\* This animal's colour pattern is most unusual for a member of the weasel family. It is a deep reddish-brown, almost

## Marten

black, broken by numerous dots and dashes of reddish-brown colour.

## Martens

**The True Martens and Sables, *Martes*,** have the finest and most beautiful fur of all the carnivores—it is even more durable than that of the chinchillas. It is deep, soft, full, and generally rich golden brown in colour.

Indeed, these lords of the treetops have a most comely appearance. The head is well formed, and the ears are rather large and evenly rounded. A throat patch of creamy buff sets off the golden brown of the long body. The tail, about half the length of the cat-sized body, is bushy as a fox's.

The marten (or sable—the names are often interchanged) dwells among the thick forests of the Northern Hemisphere. An active and agile climber, it can chase up a tree like lightning. It easily outstrips the speedy squirrels, which then must pay with their lives. So many squirrels does the marten eat, that we may almost call it one of nature's checks upon the tribe of nut hoarders.

Possessed of the typical ferocity of the weasel family, the marten will sometimes fight animals many times its size. There is a remarkable instance where a marten attacked a cheviot sheep in Scotland. The sheep was found dead with its neck jammed against a rock. Underneath its neck lay the marten, killed, apparently, by the impact when the sheep, in the final struggle, had dashed against the rock. The sheep had died from loss of blood through a wound in its throat.

Normally, the little marten feeds on smaller animals. Prominent on its menu are grouse, mice, and rabbits. In the autumn, when the berries are ripe on the mountain ash, the marten grows fat on

this fruit.

So sharp are the marten's claws and wits, that few other creatures, outside man, can kill it. The great horned owl and the lynx are said to have occasional success. Unless its days are shortened by these animals or by trappers, the marten has a life span of seventeen years or so.

The mating of martens takes place in July and August. It is a long time before the young—usually four in a litter—are born. Not until April or May do they come into the world. Still, the kittens are naked, and without sight at birth. When they are five weeks old, their eyes open. Father isn't interested in the babies; their mother has complete charge until the autumn. At this time the young martens, with their long, sinuous bodies, look much like their parents and are ready to set up housekeeping on their own in the trees.

Except in the breeding season, the martens live alone and hunt alone. Squirrel-like, these animals bury excess food. Leaping from one branch to another, sometimes descending to the ground, they will hunt mile after mile, pursuing the hapless squirrels high and low, not giving up the chase until the prey has found safety in some hole too small for a marten to enter—or, more likely, has died from a sharp bite through the neck.

There are a number of different species and subspecies of martens and sables. Perhaps the most famous is the **Russian Sable, *Martes zibellina***, which ranges from European Russia across through Siberia to Japan. Its fur is exceedingly precious—so much so that the search for it lured men into the frozen wastes of Siberia long ago, and to no small degree laid the basis for the early development of that land, just as the hunt for the furs of other animals helped to open up Canada and the western United States.

Anyone who has ever seen Russian sable can appreciate why it is so highly valued. It is exquisitely soft, delicately textured fur; each hair is evenly tapered to a fine point. The general colour of the coat is grey-brown, with underfur varying from soft grey to light yellowish-brown (though some sable pelts are almost black, beautifully and evenly flecked with white hairs). The most esteemed grade of sable skins generally comes from the smaller animals.

**The Stone Marten or Beesh Marten,**

*Martes foina*, has fur which is not so fine as that of the more northern species. We find this animal in continental Europe and east to Mongolia and China. It is the common marten of central Eurasia but it never did occur in England. There, the **European Pine Marten,** *Martes martes*, is the usual species, though even in Scotland it is rare today. Its range covers the wooded regions of Europe from Britain across to Asia.

The European pine marten is dark brown with a cream-buff throat patch; it has a head and body length of nineteen inches and a tail half as long again. Hundreds of years ago, when the creature was more abundant in England, hunting it was a favourite sport. To distinguish this animal from its evil-smelling relative the European polecat, or foomart ("foul marten"), it is sometimes called the "sweet marten."

Similar is the **American Pine Marten,** or **Hudson Bay Sable,** *Martes americana*, which lives chiefly in Canada from the Great Lakes north to the timber line and west to Alaska. This marten possesses a handsomer fur; it is rather pale buff-brown in colour, and shadowed with the dark tips of the long guard hairs.

In the wooded mountainous country of eastern Asia dwells the **Yellow-throated**

**Marten,** *Charronia*. It is larger than the pine marten, growing up to two feet in length, and has a longer tail (about seventeen inches). Its general body colour is dark brown, almost black; the chin and throat are white, and the under parts are yellow or bright orange.

The Manchurians call the yellow-throated marten a *mi-kow*; or "honey dog," because it has a sweet tooth. This large, robust marten has been seen in China, now and again, sitting outside a beehive snapping at the honey bees going in and out; apparently it is attracted there by the smell of the honey.

The yellow-throated marten is also fond of fruit, berries, and nectar from flowers, and sometimes it will hang by its hind feet from one branch while reaching for fruit on another. But otherwise this animal is close to the pine marten in its ways.

**The Fisher,** *Martes pennanti*, is the terror of the American North Woods. When angry, it is the embodiment of unrestrained fury. Its eyes blazing with a green glow, it hisses, snarls, and screams its hatred at an aggressor. With its back arched and fur bristling, it presents a front that few animals would dare approach. It can whip any dog or coyote, or even a black bear in single combat, and send them scurrying off.

Though streamlined like its relative the weasel, the fisher has tremendous power. Every living thing it can master (and that includes all but the largest carnivores in its home range) is food for the fisher—fox, lynx, raccoon, as well as rabbits, mice, rats, squirrels, grouse, amphibians, and reptiles are preyed on by the whirlwind spitfire. According to reports, it will kill deer, and probably mountain sheep are hard put to defend themselves against it.

## Tayra

The fisher is the only carnivorous animal that habitually assaults the porcupine and suffers no ill effects from the spines: it swallows the barbed quills.

The fisher knows just how to get past the porcupine's guard without being clubbed by the needle-spiked tail. It speedily sinks its sharp teeth into the unprotected throat or the under side, and the porcupine is no more.

For the fisher, killing the porcupine in the snow is a much-relished pastime. Sometimes the porcupine hides its vulnerable head under a rock or a log and rattles its deadly tail, daring the fisher to come closer. The wily fisher has an answer for that one; it burrows under the snow and gets the porcupine from below.

What manner of savage beast is the fisher? In reality, the animal is a large marten. It looks a good deal like the pine marten, only its fur is dark and not so fine, and the ears are shorter and more rounded. From the tip of its nose to the end of its foot-long tail it may measure four feet (females are smaller). It weighs up to eighteen pounds.

Sometimes the fisher is known as the Pekan, Pennant's Marten, or the Black "Cat." Fisher seems to be the most popular name, though oddly enough the animal does not fish.

The fisher, if it is found at all, will be seen near watercourses in forested lowlands. It can swim across swift rivers and broad lakes. In the trees it is one of the swiftest of climbers, and even races down tree trunks head first (many other animals back down cautiously). Travelling on the ground, it bounds along, covering four feet at each leap.

This carnivore is a night prowler, and is active the year round. It may stay in its den during a severe storm, but ordinary snow and rain will not keep the fisher

home.

The fisher's breeding habits remind us of the marten's. Its favourite den is a hollow tree. It mates in April, and the young are not born until eleven months later.

The fisher family consists of about four babies. They see the light of day seven weeks after birth and do not venture outside the den until they are fully three months old. Throughout, they are exclusively under their mother's care. In the autumn, the young are ready to investigate distant fields and find a home for themselves. They reach full maturity when two years old, but females will breed within a year from birth.

## Tayras, Grisons and Zorillas

**The Tayra**, *Eira*, is a "weasel badger" which haunts the tropical forests and brush country from southern Mexico to Bolivia and Paraguay. The tayra measures two feet in length without the seventeen-inch tail, and is a long-bodied, short-legged animal, coal-black in colour except for the head and neck, which vary from almost black to nearly white.

Being a good climber, the tayra spends much of its time in the trees hunting for fruit, berries and birds' eggs, but almost anything edible is food for it. It is socially inclined and travels in family groups. This animal's bold and curious nature is often its undoing; it will fearlessly approach an armed man and learn too late he is no one to take lightly.

A much smaller animal, the **Grison**, *Grison*, is a neighbour of the tayra. It resembles a tiny grey badger and lives in the ground. We can distinguish it from yet another interesting "weasel badger," the **Quiqui** or **Huron**, *Grisonella*,

of Argentina and Chile, by the broad white line that extends across the face and back along the outside of the grison's neck. The quiqui is trained by the natives to drive the chinchillas out of their dens in the rocks.

**The Zorilla**, *Ictonyx*, known locally as the Striped Muishond ("mouse hound"), is the most familiar species in Africa. It ranges from the Cape north to the Isthmus of Suez and into Asia Minor. Its long, loose fur is marked with black and white lines that extend from the head to the lengthy white tail. This creature is not more than fifteen inches in head and body length. The zorilla, too, combines characteristics similar to both the weasels and the badgers.

In general the zorilla and its close relatives (among them there is a Striped "Weasel") are useful animals as they destroy large numbers of snakes, small rodents, and injurious insects (they will also kill birds up to the size of a guinea fowl). When attacked by dogs, the zorilla ejects a nauseating musky fluid in the face of the attacker and then feigns death until the coast is clear. Thus it combines in its defence the pacifist characteristic of the American opossum with the positive action of the skunk.

## Wolverines

**The Wolverine**, *Gulo*, is one of the most thievish, daring, and powerful animals in the world. It is the biggest member of the weasel family, and none exceeds it in ferocity and cunning.

Not many people know this shaggy, four-foot-long creature that prowls the northlands. But as it stalks along, the animals that glimpse the dark-brown bearlike form, with the tell-tale broad ribbon of pale brown fur on each side,

start up and look for refuge. Even the massive bear, the wolf, and the mountain lion, gorging themselves on their kill, will move off rather than contest its possession against the sharp claws and teeth of the wolverine.

The wolverine is a killer. When it fights, it fights to win; it neither asks nor gives quarter, and it does not know the meaning of fear.

Not fast on foot when compared to the caribou and mountain sheep, the wolverine captures both of these large animals by stalking them stealthily and craftily. It



### Wolverine

**Almost three feet long, these, the largest of the Weasels, are famous for their cunning and voracity.**

will climb into a tree or up on a high rock and leap upon them, sinking its teeth into their necks. Almost no four-footed mammal, including the bear and possibly the puma, is secure against its attack.

The wolverine got its name because of its supposed resemblance to the wolf, either in its looks or its habits or both. It is also known as the Carcajou or Skunk-Bear. Another common name, and well deserved at that, is "glutton." This animal indeed possesses a ravenous appetite. It appears always to be hungry. No other carnivore, we are sometimes told, can devour so much in a single meal.

Occasionally the wolverine will clean

## Common Badger

up a whole deer or a caribou in what may seem to be a continuous feast, but what is really a number of successive meals. Accordingly, there is a tradition that the wolverine consumes more than its own weight in food at one time. This is simply not true. An average wolverine weighs thirty- or thirty-five pounds; a big one, fifty. It never eats such a poundage in one repast. To understand this ferocious beast's hunger, you must realize that there are long gaps between its meals; sometimes its fasts may last a week or two.

The famous scientists Linnaeus and Pallas showed they were well acquainted with the wolverine's habits when they named one common species *Gulo luscus*. The first half of the name means "glutton"; the second half refers to the animal's poor eyesight, and could be translated as "half-blind." The wolverine gives marked evidence that it cannot see well. It will sit up on its haunches and shade its eyes with a fore paw in a most human manner. This curious habit has been witnessed on several occasions, and one of the animals frequently repeated the performance. Since the wolverine is subject to snow-blindness, we may suppose it shields its eyes to protect them from bright sunlight when peering into the distance.

The wolverine is solitary in its habits. After a brief courtship in February or early March, the male and female split up, each going its own way.

The female's den may be a hollow tree, a cavern among rocks, or any hideaway that is comfortable and sheltered. Here, during the warm days of June, when the sun never sets in the northland for four long weeks, the young—they rarely number more than two or three—are born. The babies are clad in thick woolly fur. Their mother takes good care of them, and by autumn they are half-grown.

When the first snow flies, they must forage for themselves.

Wolverine fur is not outstandingly valuable in the fur market, but it does have a unique use. It is the only type of fur that does not mat and freeze when the temperature drops to sixty or seventy degrees below zero. The Eskimos are well aware of this: they trim their parkas with wolverine fur around the hood and sleeves, where body moisture escapes. Any ordinary fur will freeze to the face and wrists under conditions of extreme cold, but wolverine fur remains unchanged.

The range of the wolverine in North America extends from the southern islands of the Arctic Ocean across the Barren Lands to southern Quebec in the east, and to Colorado and south-eastern California in the west. It is now practically gone from the United States; the last individual had disappeared from Michigan, the Wolverine State, long before any official record was made that the species had been exterminated there.

## Badgers

**The Common Badger**, *Meles*, was the subject of a bloody sport in England up to the early part of the last century. This tough, wedge-shaped little animal was placed in a barrel or a man-made hole inside a pit, and dogs were loosed upon it. With its long, sharp claws and its strong teeth, it fought back as best it could as the dogs tried to draw it from its hole.

This cruel pastime, ended by law in 1850, has left its mark in our language, but nowadays we are more likely to badger people than to badger the badger.

Upon its face the Eurasian badger wears the badge for which it is named. Each side of the white head is marked with a conspicuous black line that runs



**Common  
Badger**

from the nose over and surrounding the eye and over the ear. Its body looks grey to us for each hair is partly black and partly white. (Badger hair is used in the manufacture of the best shaving brushes; in fact, the French word *blaireau* means both "shaving brush" and "badger.")

This animal measures up to three feet long, and, with its short black legs and stump of a tail, suggests a small bear. It weighs about twenty-seven pounds, on an average.

Lacking the ferocity of the weasel and the wolverine, the badger prefers to use its claws for digging. A shy, cautious creature, it spends the daylight hours underground, in the home it has excavated for itself. Its burrow or sett is usually in a wooded hillside, at the end of tunnels, which may penetrate for a hundred yards or more. These subterranean tunnels form a winding labyrinth three (badger) stories deep. The entrances are always marked by huge piles of dirt, indicating that the animal is constantly at work enlarging and improving the "sett."

The badger likes to sleep on a bed of bracken, moss, and straw. But first it must collect them and bring them underground, and it goes about the job in a most painstaking way. To begin with, the badger gathers the bedding up into a small heap. Next it cuddles the bundle between its forepaws and nose. Taking

care that it does not lose any of its cargo, the badger shuffles backward to the entrance. Now it backs down into the hole, and so to the den.

It is not unusual for several families to occupy the same badger "setts" during August and September, but they separate before the winter sets in. Mating season for the badgers extends from July to mid-November. The sow normally has one litter a year, in February or March. Her usual number of babies is two but occasionally she bears triplets. The young grow rapidly, and are ready to leave the care of their parents in the autumn.

Badgers never depart from their setts before dark. Then they hunt for all manner of animals, including beetles, worms, hedgehogs, small rodents, and rabbits. They readily detect their prey by scent and dig them out of the ground if necessary. Fruits, nuts, and vegetables are also food for the badger, which may store them in its den in the autumn for winter use. It does not hibernate, but may sleep when the temperature drops to or below zero.

The badgers have few natural enemies, and many live out the normal life span of ten years. They probably die in an underground chamber, which is then sealed off by other tenants of the badger "earth."

The range of the Old World badgers reaches from the British Isles and Spain

## American Badger

across Europe and northern Asia to Japan. The southern limit in Asia is the Himalayas. The badgers of Eurasia are separable into four general groups: the typical or European Badger, the Siberian Badger, the Caucasian Badger, and the Japanese Badger.

**The American Badger**, *Taxidea*, is a superb digger, like its Old World kinsman. Using all four feet, it can sink underground in a matter of a few seconds. It is perhaps the fastest excavator in America; according to report, it can outdig both the pocket gopher and the mole, famous masters of the trade.

The badger makes the most of its long, powerful claws. It feeds to a large extent on ground squirrels, which it digs out of their burrows. By some ingenious method of calculation, known only to itself, the badger sinks a shaft straight down to the spot where the rodent is concealed. It rarely, if ever, misses the exact location, and so saves itself the almost impossible job of trying to catch its prey by entering and widening the squirrels' long tunnel from the entrance. When the victims are more than the badger has an appetite for, it will bury their carcasses against a leaner day.

Lizards, insects, gophers, rabbits, mice, and birds—these, also, the badger pursues. When larger animals pursue it in turn, it will fight back—unless they are just too large, like the coyote. Then the badger seeks safety underground.

We find the American badger in central North America from the Great Lakes region north through Alberta and British Columbia, and southwest through Nebraska to California and northern Mexico. (Wisconsin is known as the Badger State, but not simply because of its badgers. The allusion is to the early lead miners, who dug their winter homes

in its hillsides, we are told.)

The American badger is a creature of the open country, often making its home in plains, prairies, and deserts. Here it lives four or five feet below the surface in a cozy den which it lines with dry leaves or grass, like its Eurasian relatives. It reaches the den by means of a tunnel many feet in length. During the day, it remains indoors.

In the northern limits of its range the badger puts on fat during the autumn and then holes up for the winter, blocking the tunnel to its den with soil. It does not go into a true state of hibernation, but alternately drowns and wakens. Occasionally it will leave its den and go hunting across the snow, but it eats little during the food-scarce cold months. In the south it remains active the year round.

The American badger mates in the late autumn of the year or in the early winter. Apparently the development of the babies in the mother's body is delayed for the first two months in regions where it is really cold (this does not happen with the Eurasian badger) and the total period may take thirteen weeks.

Two to seven blind and hairless young are born as late as May or June in northern areas. They open their eyes when they are about five weeks old when they are half-grown and ready to be weaned. From this time until they are two-thirds grown, the mother brings food to them or (later) takes them on hunting trips.

By autumn the young badgers are big fellows, and move off in different directions, each to claim a domain of its own, as their mother enters a new breeding season.

Much like their relatives in Europe and Asia, the American badgers are flattened, stocky, short-legged animals, with very short tails. They stand about nine inches

at the shoulder, are two feet long or more, and weigh from twelve to twenty-four pounds, being somewhat smaller than the Eurasian badger.

The animal's general colour is silvery grey. The face is dark brown and marked with a narrow central white stripe; the cheeks are white, too. The "badge" is thus quite different from the Eurasian badger's.

**The Sand or Hog Badger, *Arctonyx*,** of south-eastern Asia, has a white tail that is comparatively long for a badger; on the islands of Java, Sumatra, and Borneo, dwells the **Teledu, *Mydaus*,** a small brown badger with a broad white band down its back. These white markings are the warning signals often carried by animals capable of discouraging possible enemies by discharging an offensive-smelling liquid musk.

**The Ratel.** Throughout Africa and in Asia Minor and southern Asia the Ratel, *Mellivora*, is as famous as the badger is in Europe and the New World. Enjoying the reputation of a fearless and desperate fighter, it is a powerful, thickset animal about the size of a badger, with tiny ears. In colour the ratel is usually grey or white on the back and jet black below. As you might suppose from its skunklike colour scheme, it is protected from many of its enemies by its fetid discharge.

The ratel is at home in the rocky hills, on the grassy plains, and in the forests (though it does not climb trees). Armed with powerful claws, it can tear down termite nests and anthills to get at the larvae. Reptiles, rodents, rabbits, and birds, as well as fruit, are also included in its diet.

The ratel's thick hide, which covers its body like a loose coat of rubber, is impervious alike to the fangs of venomous snakes, the quills of porcupines, and the

stings of bees. The animal is partial to honey in particular, and forms an interesting association with the little bird known as the Honey-Guide. On discovering a bees' nest, this bird emits a series of high-pitched notes that are recognized by the ratel. Following the cries of the bird, the animal soon discovers the bees' nest and proceeds to tear it apart, gorging itself on the young bees and honey. The bird, too, comes in for a share of the feast, which it could not have without the aid of the ratel.

Its hunger satisfied, the ratel lies up in a den among the rocks or in a hole in the ground. It is not a social creature and travels either singly or in pairs. The female gives birth to a litter of only two cubs six months after mating, which explains why the ratel is never very common anywhere. It does have a rather long life expectancy for a member of the weasel family: the ratel has been known to live over twenty-three years in captivity.

## Skunks

**The Common or Striped Skunk, *Mephitis*,** and its equally unpopular relatives, the **Hog-nosed Skunk** and the little **Spotted Skunk**, are American animals famous for the degree to which they have perfected the art of defensive chemical warfare.

Some Old World members of the weasel family, we have seen, can make themselves objectionable by ejecting a foul-smelling fluid, but the discharge they fire is mild and ineffective compared with the barrage set off by the skunks. (Most weasels and badgers cannot actually spray their odour, and we suspect that in many of these animals it is used primarily in the mating season.)

Not so with the skunk. Provoke it, and you will learn to your sorrow that it can

## Common Skunk

project a fine spray for a distance of nine feet or more. The fluid has a most distasteful and nauseating stench and produces intense smarting and burning if it comes in contact with the membranes of the eyes, nose, or mouth. If it penetrates clothing, the odour may not depart for weeks.

The skunk always carries two "guns" primed and ready to fire. They are really two large musk glands situated at the base of the tail. When the skunk becomes frightened or annoyed, it contracts the muscles surrounding the glands, forcing out the spray. With a good wind blowing, the smell may carry further than half-a-mile.

Not an animal that wastes its ammunition, the skunk uses it generally as a last resort only. Confronted with a formidable foe, the skunk first growls its displeasure and stamps its foot impatiently. If this is ineffective, its white striped tail, bristling with tension, is raised as a final warning, but fire is withheld so long as the very tip of the tail hangs limp. One step nearer by the intruder—up goes the tip of the tail—and the broadside is discharged with deadly accuracy at the head of the foe.

A direct hit at close range will cause tears to flow freely and produce temporary blindness. While the victim howls in pain, the skunk ambles off, as fragrant and pure as ever, for it is always careful not to defile itself with the evil-smelling liquid.

It is an odd and interesting fact that the malodorous oily yellow fluid produced by the skunk can be put to a pleasing use by man. He extracts it from the animal and refines it, removing the disagreeable smell. The liquid that remains has a great capacity to fix and retain aromas. It is blended with subtle and alluring scents, and the result is—fine perfume!

Perfectly aware of its power of defence, the skunk is slow and deliberate in its

actions. If unmolested, it strolls along good-naturedly. Now and then it will stop to dig up a nest of wasps with its sharp claws, and eat the grubs, for insects are staple in its diet. Or it may speed up to a trot and catch a fleeing mouse, snake, or frog. All kinds of creeping things are food for the skunk, as well as berries, fruits, and grain. People seldom see this hungry little carnivore on its foraging trips, however, for it is active mostly at night.

By day the skunk rests or sleeps. Its den is a hollow log or, more often, a burrow in the ground. During the very cold days in the winter the skunk stays at home; at this time it lives off the layers of fat it acquired in the autumn, but it does not hibernate.

Even before the winter snows start to melt, the male skunks travel far and wide to pay their respects to the females, which remain comfortably at home. Two suitors may fight bitterly for the possession of a female; they may even defile each other with their obnoxious sprays. The mating season lasts through February and March.

Some fifty days after mating time the young are born—there are four to eight of them, without sight or furry coats. The mother can nurse six babies at once. If there are more, they must wait their turn. The babies open their eyes when three weeks old, and fourteen days later they are out following their mother in single file. At the age of two months they are weaned, and depend on their own resources in early autumn.

The striped skunk is at home in Canada, the United States, and as far south as Honduras. About the size of a house cat, it stands seven inches at the shoulder, and is roughly eighteen inches long, plus a seven-inch tail.

Full grown, the animal may weigh from four to ten pounds. On the glossy

coat of long, limp hair, two broad white lines (united on the head) run backward down the sides of the body to the tip of the bushy tail. The face has a single stripe from the forehead to the middle of the nose. However, the amount of white varies with the animal, some skunks being almost completely black, and a fair number of subspecies have been named.

Skunks are not very wary when it comes to traps, and great numbers of these creatures are taken each year. Their pelts are in demand in the fur trade, which frequently sells them under the more pleasing names of "Alaska sable" or "black marten."

**The Spotted Skunk**, *Spilogale*, is a slender, weasel-like animal that weighs only one or two pounds. Its body colour is about equally divided between black and white, the white markings being a series of more or less broken narrow lines that give us the impression of spots. Only from ten to fourteen inches in head and body length, this little creature has a tail about five or six inches long, and quite bushy.

The spotted skunk has a habit of standing on its front paws and holding the rear end of its body in the air like a schoolboy showing off. This is often done in play, but it is also a warning signal. The little spotted skunk is so small that it has to raise its body up to get a good "shot" at a dog or a fox.

Sometimes called the "polecat" or "little striped skunk," in the southern states this small creature is also known as the "phoby cat," or "hydrophobia cat." During the mating season the actions of the little spotted skunk seem to border on insanity.

It is reported that in its mating madness the spotted skunk has entered a wolf's den, taken the cubs by the ears, and has

shaken and knocked them about generally; also it is said to have sprayed a bull in the face. But there is no scientific reason for thinking this small stench-bearer is more subject to hydrophobia than any other animal, and in other respects its habits are much the same as those of other members of the skunk tribe.

The little spotted skunk makes its home from southern British Columbia in the west and northern Virginia in the east through Mexico to Costa Rica. It is a creature of the plains and the dry desert regions. Its long, soft fur is known as "civet cat" in the fur trade. Civet cats, as such, are entirely different animals, of course, and are discussed in a later chapter.

**The Hog-nosed Skunk**, *Conepatus*, also makes its home through Mexico and as far south as Chile and Patagonia. A robust animal about the size of a striped skunk, it possesses a striking adaptation for getting its livelihood: the head is long and the muzzle naked, somewhat like a hog's snout. With this remarkable natural tool, the hog-nosed skunk roots in the ground for insects, which make up a good part of its diet.

Rather coarse black or brownish-black fur clothes this skunk, and, along its back, from the top of the head to the tip of the tail, there runs a broad white band, but this is variable—there may be two white lines or very little white indeed, particularly in the South American skunks.

We have already observed that poisonous animals or bad-tasting ones seem to advertise their nature to creatures that might otherwise make the mistake of attacking them. In the case of the skunks, the striking white marking, standing out against the black, provides an effective warning and—by no means incidentally—protects the bearers.

## Otters

**The North American Otter**, *Lutra canadensis*, is the fastest mammal in the fresh-water lakes and rivers of its homeland. There it cruises along at six miles per hour, but it can go much faster if need be. It can swim a quarter of a mile under water, remaining submerged four minutes and more without coming up for air.

Almost identical to this otter, in both appearance and behaviour, is the **Common Otter**, *Lutra lutra*, of Europe and Asia.

Above all else, otters are fishermen. They have been known to kill a fish up to twenty pounds in weight; usually, however, the quarry is much smaller. At times they take the cunning trout, but they are more inclined to hunt easier prey such as sunfish and other sluggish varieties. The otters catch the fish with their forepaws, then rip it apart with their teeth.

Except during the breeding season, otters are continually on the move and will travel a twenty-mile circuit of connecting lakes and rivers in two or three weeks. Where there is good fishing, they remain awhile, but not for long. When the water freezes over, they often travel overland, looking for rivers or rapids that are still flowing. Unlucky are the ducks, muskrats, and young beavers the otters encounter, for these fishermen like to vary their diet now and then. They are active both day and night.

The otter is streamlined for darting through water. It has a lithe, muscular body, a broad, flat head, small ears, and a long, powerful, tapering tail which serves as a rudder. Its limbs are short, but the strong hind feet are large and broadly webbed. Its oily coat is rich dark brown in colour, with very full and dense fur

that keeps the animal warm in the water.

Few animals will attack this water-loving member of the weasel family. When a large beast goes after it, the otter escapes by diving into the water or, in winter, alternately racing and sliding across the snow. Sometimes it will stand and fight. It can give a good account of itself, even against dogs.



In character the otter is above even the suspicion of having bad habits. It is gentle and friendly with all its associates, and likes to sport and play.

This animal's favourite pastime is to coast down a steep "slide" as children love to do; in the summer the bank of a stream is used. Taking turns, a family of otters will plunge down one after the other in quick succession, the water from their bodies greasing the slide and heightening the fun. In winter the highest snowbank in the vicinity is used for a slide, and the sport becomes fast and hilarious.

The otter's den is usually a hole in the bank of a stream or lake. This swimmer likes quick and easy access to its home, and so the main entrance is under water. There is a back door, too, used for ventilation, and this, for safety's sake, is hidden in the bushes on the bank. For comfort, soft moss and dry leaves line the floor of the den.

We are not sure exactly when the otter's mating season occurs, and there is some question as to whether or not both parents take part in raising the family. The baby otters are born in April or May and as a rule they are twins; occasionally there are three, but rarely more. It is a month before their eyes open; then the young are taught to swim.

For the first few trips in the water, the young otters ride on the mother's back. One day she submerges and leaves the kittens to struggle as best they can in the shallow water.

Otters raised in captivity can make fine pets, and in some countries do service as retrievers, particularly of waterfowl. With a normal life span of eight or nine years, otters may live up to the age of sixteen under favourable conditions. On an average, they weigh about twenty pounds and are some thirty inches in length, plus the foot-long tail.

**The Sea Otter**, *Enhydra*, is as much at home in the sea as a seal. The greatest of the otters, it was friendly and trusting when first discovered, but persistent, relentless hunting for its valuable fur has made it extremely shy of man, and whittled down its numbers. Today it rarely comes to land. Instead, it passes its life offshore in great beds of floating kelp, a type of brown seaweed. Its range is limited to the shores of the North Pacific.

The otters of our inland waterways, adept as they are in lakes and rivers, rate as mere landlubbers beside the salty sea otter. It is born in the water, it eats in the water, sleeps in the water, grows old and dies in the water.

The sea otter loves to float, and swims as easily as a fish. Generally it lies on its back and propels itself with its tail. For greater speed it turns right side up, and, its body undulating, it strikes out with both webbed hind feet. Sometimes it uses them in unison, sometimes alternately. Often it races along at a rate of ten miles an hour.

Though the sea otter takes some fish, it is not a confirmed fisherman. It may go down a hundred feet or more in search of its daily fare, dredging from the ocean floor sea urchins, crustaceans, cuttlefish, mussels, clams, abalone, and other shellfish. Bringing its victim back to the surface, the sea otter spreads the lunch out on its belly and chest, and leisurely eats as it floats on its back.

Like most mammals that live in the water, this one does not drink, though it consumes some salt water with its food.

Sea otters are scarce, and we lack complete knowledge of their life history. We believe, however, that they breed throughout the year and that the parents mate for life. Nine months after mating time a single pup is born—not in a nest or den but on a thick bed of floating kelp.

## Giant Otter

The place is usually a sheltered natural harbour. Sometimes, though, it is a rocky island, but one that is bare of human habitation and a safe distance offshore. Unlike so many of the weasel's cousins, the pup is born with its eyes wide open.

Nursing her baby, watching over it, and giving it good care take up a large part of the mother sea otter's time for six months or even a year. Doing all of these things in the water is an art. The mother suckles the pup as she floats on her back in the water. (Sea otters normally spend their resting and sleeping hours floating in this fashion among beds of kelp.) In a playful mood, often she tosses it in the air and catches it again.

Travelling with baby, the female sea otter lies on her back in the water and paddles along with her webbed hind feet, clutching the pup to her breast with her tiny but strong front paws. When she must go off for food, she leaves her little one floating hidden in the kelp.

We have said that the sea otter is the largest of the otters. What little it may lose in length when compared with one of its big relatives, the giant river otter of Brazil, it more than gains in bulk. A big sea otter may weigh up to eighty pounds. Its head and body length varies from three to four feet, and the tail adds another foot. A heavy, thickset animal, it is much less sleek and graceful in appearance than the river otters. The pelt is very full, soft, and deep; it is brownish black in colour and more or less finely grizzled.

With the exception of the lurking killer whale, the sea otter has few natural enemies. Even at its slow rate of reproduction it maintained a fair population. However when its fur became commercially valuable, overhunting became the rule, and the species was well-nigh exterminated.

Fortunately, conservationists took an interest in the matter: today the sea otter enjoys full protection in accordance with an international code that provides refuge and outlaws the sale of pelts. Over a period of years strict enforcement of this code has saved the animal from being wiped out altogether. In time we may glimpse the fascinating sea otter more and more, playing and hunting in its favourite haunts off the shores of the Pacific, from southern California to the Kurile Islands.

Otters are much alike, wherever we find them. The South and Central American otters differ from the North American species only in size and certain minor features. Perhaps the most noteworthy is the **Giant Otter, Saro**, or **Flat-tailed Otter** of Brazil, *Pteronura*. A native of the waters of the Amazon River basin, it is one of the largest river otters, measuring five feet in length.

In Australia, Madagascar, and on the islands of the South Pacific we do not encounter the otters, but they are common throughout the Old World. Some have marked peculiarities. In the **Clawless Otter, Paraonyx**, an African animal, the forefeet are small, with five naked fingers without claws; only the third and fourth fingers on the hind feet bear minute claws. Its big cousin, the **Giant African Otter, Aonyx**, weighs sixty pounds and may be longer than five feet. Dark brown in colour, it is often tinted with white and has a broad splash of white on its throat and chin. This otter's claws, too, are rudimentary or absent altogether, so that it lacks adequate defences against its dreaded enemy, the crocodile.

In Asia and Sumatra we even find the **Hairy-nosed Otter, Lutra sumatrana**. The nose pad, naked in most species, is covered with fine hair, but whether this has any special use as an adaptation cannot be said.

## Carnivores: 5

# The Genets, Civets and Mongooses

Combine the long, slender body of the weasel—a rough representation of the head of the fox—the short limbs of the marten—and the tail and disposition of the cat—and there you have the “weasel cats,” as we may call this group. In the warmer parts of the Old World they have taken the place occupied by the weasels in the north.

Many of the weasel cats have scent glands, like the weasel family. Some of these creatures—in this they resemble the members of the cat family—possess sharp claws, which they carry sheathed in their feet when there is no need to slash or climb. (Others have nail-like claws that cannot be moved in and out.) Again like their cousins the cats, the genets, civets, and mongooses walk softly and spring swiftly upon their prey.

There is a large army of weasel cats, and they control the many small animals

that breed at high speed all the year round in tropical regions. Beasts of prey, they are nevertheless ready to compromise with hard times. When rodents and small game abound, these resourceful little carnivores live by killing. However, a dearth of animal life is no major catastrophe for them, as it would be for the cats or the weasels proper; the weasel cats supplement their flesh diet with insects, fruit, and even vegetables and over herbivorous matter.

The weasel cats are not considered high-class fur-bearers, though the pelts of some species are used. Often the coats they wear are quite handsome. The fur of many is ornately or even gaily marked with spots and stripes, while a good number of these creatures are brightly coloured. All make up a family called the Viverridae, a name which comes from the Latin word for “ferret.”

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## Genets

**The Genet** is not a large animal; the several species range between eighteen and twenty-three inches in head and body length. The tapering tail, about as long again, is ornately banded with dark brown or black rings. The pointed face, with prominent ears, sits gracefully on a long, slender body with short legs. The animal's sharp hooked claws may be drawn in or extended, like a cat's; they are not only well suited for climbing trees but also for striking down fast-moving prey. Running down the genet's back there is a line of stiff hairs which stand erect when the beast is excited.

The genet, in its various forms, has an enormous range: it is found all the way from Spain in southern Europe to western Asia, and south through East Africa to the Cape. (It is commonest in Africa.) For some strange reason the creature has bypassed the greater part of Asia in establishing itself in its present domain.

The question of why animals penetrate certain regions and not others near by poses a fascinating problem for the naturalists. Barriers are chiefly climatic or physical. When they are impassable—like the edges of oceans—accidents or factors outside the “laws of nature”



**Genet**

**This small, lithe, agile animal of Africa is mainly aboreal and nocturnal.**

may eventually permit some species to pass across. (Thus, for example, the wild dogs known as dingoes appear to have reached Australia in the boats of ancient man.) The genet, on the other hand, has, or seems to have, a full passport to Asia—yet somewhere there is a taboo around most of that continent, keeping the animal out. Possibly the competition of native species is the decisive element here, but it is not obviously so.

All the genets are night prowlers, lying up during daylight hours in hollow trees, a crevice in the rocks, or a burrow in the ground. After nightfall the long, lithe body weaves through tall grass and thickets like a snake. More often the animal is glimpsed in the trees. Once in a while it may be seen before the sun has actually set, travelling either singly or in pairs. It moves cautiously, preferring dark, shady places where rocks and bushes provide cover. A home-loving creature, the genet returns daily to the same hide-away.

The genet is above all a small-game hunter. It seeks out rats and mice that prowl about the jungle floor. It will devour any reptiles or insects that cross its path, and climbs about in the trees and thickets in search of small birds roosting there. Remains of hares and guinea fowl have

been found outside its den and it is well known as a raider of chicken pens. On occasion it goes for bigger game.

When cornered, a genet will put up a good fight, growling and spitting like a house cat. It can slash out with its claws faster than the eye can follow. Still, it is no match for a dog. It has a reasonably long life expectancy, and has been known to reach twelve years of age.

There is no fixed breeding season among the genets, nor do they bear large families. Two or three is about the average for a litter. Almost any kind of retreat will serve as a nursery, so long as it is safe, warm and dry.

As we find in most other kinds of animals, there are several species. Africa has a number of varieties such as the **Leopard Genet**, the **Tiger Genet**, and the **Crested Genet**. All are more or less conspicuously marked and coloured as the popular names indicate. They are variations of the **European Genet**, *Genetta*. The genet of southern Europe was used as a domestic cat by the ancient Greeks and as late as the sixteenth century was common and tame in such cities as Constantinople.

**The Linsangs** are the most catlike of all the weasel cats. These creatures of tropical Asia and the East Indies rather resemble the genets in general form, only they are somewhat smaller—about fifteen or sixteen inches is the average length, plus a tail almost as long again. They are handsome fellows, too—the **Spotted Linsang's** slender body and superb tail are golden brown with a bold pattern of large black spots. The **Banded Linsang** has five broad bands running across its body, and the tail is banded with alternating dark and light markings.

Linsangs live by hunting live game, and will disdain any food except meat.

Though appearing to be better suited for travel on the ground, like the genets they are extremely active in the trees. They breed twice a year—once in February and again in August. The babies come two to the litter as a rule, and are born in a hollow tree, so far as we know.

The linsangs received their name from the Javanese. These animals make up the genus *Prionodon*, which means "saw-tooth"; the teeth really do look jagged and sawlike. The so-called **African Linsang**, *Poiana*, of the Congo, is in reality a small genet with a spotted coat like the rest of the genets.

## Civets

The Civet Cats are important for two chief reasons. First of all, they unwittingly serve as foresters, being instrumental in the planting of trees. In addition to flesh, civets eat fruits and berries. They do not digest the seeds. These are distributed over a considerable distance, where they germinate and eventually grow into trees.

But this helpful work is not the main source of the civets' value to mankind. The animals' name comes from an Arabic word, *zabad*, which refers to a scent—civet—extracted from the musk glands. A good commercial price is set upon civet, this substance being used extensively in the Orient as a basis for perfume and as a drug.

There is nothing mysterious about the civet or secretion. It is made up of free ammonia, resin, fat, and volatile oil, and is located in a double-pocket pouch under the skin of the animal's abdomen, with an opening near the tail. The natives insert a spoon in this opening and extract the jelly-like dark yellow substance. This sounds easy to do, yet requires much skill. The civet cat not only possesses sharp teeth but it is strong and agile as

well, and can inflict nasty scratches with its claws. (The animals, of course, are kept in cages.) The musk is extracted every fourteen or twenty days.

In nature, the civet cat uses its musk glands for scenting tree trunks, the ground, and similar objects, as a means of communication, so that members of a species will be able to find each other at night in a dark forest. Like most night-prowling animals, the civet cats—so far as we know—are generally silent and might have a difficult time keeping in touch with one another if they lacked the scent.

The larger carnivores occasionally attack civet cats. In such an emergency, some of them will suddenly and unexpectedly discharge their evil-smelling, burning secretion into the face of the foe. This frustrates the attacker long enough for the civet to escape.

One of the best known of these weasel cats—and an excellent producer of civet—is the **Civet Cat** of India and the Orient. This big creature (it has a head and body length of two feet, plus a tail one and one-half feet long) is easy to identify: it has a full, black-and-white-ringed tail, many ill-defined dark markings on its grizzled body, and across the throat there runs a broad black band, set off by areas of white. A prominent crest of long erectile hairs extends down the middle of the back. To complete this striking picture, the feet are black. The fur of this heavy-bodied animal (the oriental civet may weigh twenty-five pounds) is thick and soft, making it of considerable importance to the fur trade.

All the civet cats have well-developed musk glands, and the **Rasse**, *Viverricula*, a smaller species of eastern Asia, has been introduced into Madagascar, Socotra, and other islands for the sake of its scent. The **African Civet**, *Civettictis*, is much

## Water Civet

like the large oriental species both in size and markings but its fur is coarse and limp—it is used commercially only for trimming cloth coats. This animal is probably the “sentoivane” of African folklore—the mysterious creature whose hairs are said to be used by witch doctors to dye milk red.

There is a fisherman among the civets, a beautiful species with a dark chestnut-brown body, white lips and throat, and a bushy reddish tail. The **Water Civet**, *Osbornictis*, catches fish in the rivers and streams that thread through the jungles of the Congo. It has sharp teeth for holding its slippery finny prey and the soles of the feet are naked for easy travel on mud flats. (In other civets the soles are more or less hairy.)

So far we have had the civets that live on the ground and feed largely by hunting small animal life. The palm civets (there are several kinds in Asia and Africa) live in the trees and subsist largely on fruit. One, the **Asiatic Palm Civet**, *Paradoxurus*, is known throughout India and Ceylon as the “toddy cat”—it is especially fond of toddy, the juice of the palm tree, which it drinks from the vessels attached to the trees by the natives to receive the liquid.

Like all the palm civets, this one is a creature of the night, and lies up during the day curled in a ball among the fronds of palm trees. Mango groves are also one of its favourite resorts. It not infrequently haunts human habitations and sleeps in thatched roofs.

The **Otter Civet** or **Mampalon**, *Cynogale*, of the Malay region, is the only civet that has really taken to the water while retaining its tree-climbing habits. It has the flat head, broad toes and feet, and thick, dense fur of an aquatic animal. It swims and fishes like an otter and is as much at home in the water as on dry land.

Most remarkable of the Asiatic civets is the **Binturong**, *Arctictis*. This lop-eared creature resembles a large palm civet—it is over two feet long, with a tail of almost the same length—and wears a black, shaggy coat. But its most outstanding peculiarity is the lengthy, powerful tail. Like the monkeys of South America, the binturong can hang by its tail or possibly use it as a fifth hand, a great convenience for an animal that lives in the trees.

The binturong is at home in the forests of Assam and west to the Philippines, including Sumatra and Borneo. It appears to be the only noisy member of the civet group. Its loud howls, we are told, will often shatter the relative quiet of the jungle night.

Madagascar is noted for its many strange, primitive forms of animal life (the lemurs and tenrecs are other primitive Madagascan animals) and not the least curious among them are the local weasel cats. Several are exceedingly graceful animals, no larger than rats. One, the agile little **Vontsira**, *Galidia*, has a bright reddish-brown coat and a bushy tail and bounds about in the trees just like a squirrel during the daytime. The **Striped Madagascar Civet**, *Galidictis*, is ornately marked with six or eight black stripes down the back. There are several species, with narrow or broad stripes, and these animals are of some economic value as mouse-catchers.

There are still other civet oddities in Madagascar. One of the most interesting is the **Falanouc**, *Eupleres*. This creature offers a remarkable instance of a carnivorous animal that has given up a flesh diet and taken to eating insects and soft fruit. Its teeth and jaws are extremely small and weak. For the rest, it is a large, brown, fuzzy-haired animal about the size of a house cat, with a bottle-brush of

## Common Mongoose

(In the battle the mongoose carries the stiff hairs of its body and tail at right angles, which makes the animal appear larger; presumably this is a factor in causing the snake to strike short.)

Each time the reptile drops to the ground fully extended at the end of its strike, the mongoose springs in and attempts to sink its teeth into the back of its enemy's head. Finally it inflicts a fatal wound, and the mongoose eats the snake, head first, including the poison glands. When fully gorged, it lies down to sleep; it resumes the feast on awakening.

The mongoose is capable of killing any creature up to its own size. Besides reptiles, it feeds on birds, insects, rats, and similar animals. More active by day than by night, it usually hunts in the early mornings and late evenings, though it may be about during the midday heat and at any hour of the night.

Mongoosees in a general way resemble the civets and genets but their claws cannot be drawn in like a cat's. Possessing a comparatively lengthy and hairy tail, a pointed face, and low rounded ears, they do not, like the civets, have scent glands. The fur is usually a grizzled brown or black.

**The Common Mongoose, *Herpestes***, is the only kind of mongoose that lives in



**African Grey Mongoose**



### Falanouc

Sometimes called the **Anteater-Civet**, this civet is found only on the island of Madagascar.

a tail.

The **Foussa, *Foussa***, is another strange Malagasy civet. A robust animal with four black lines down the back, it feeds on insects and lizards. It should not be confused with the fossa, which is described later.

## Mongoosees

**The Mongoose**, a long-bodied, weasel-like animal with a lengthy, bushy tail, is famed as a killer of snakes. Although no larger than a house cat, it will engage even a seven-foot foe. It does not generally seek combat with reptiles, but, when hungry, it needs no other incentive to attack them. In southern Asia and in Africa, where poisonous snakes abound, the mongoose is one of the commonest of carnivores.

An experienced old mongoose will quickly kill a cobra. Like a clever boxer, it provokes the deadly snake to strike—but the uncanny expert judgment and sharp reflexes of the mongoose enable it to dance away unharmed. Time and again the snake lashes out and misses.

## Crab-eating Mongoose

Europe—southern Spain to be exact. A slender animal, it measures close to two feet in head and body; its tapered tail is several inches shorter. It has short legs, with large feet, and its head is rather small and pointed. The woolly coat is a uniform mixture of pale buff and black, except for the tip of the tail, which is all black.

In Asia we find the **Crab-eating Mongoose**, *Herpestes urva*, a large creature with long, thick fur like that of a woodchuck or badger. Grey in colour, it has a horizontal white stripe on each side of the neck and its feet are blackish brown. It weighs up to six pounds. The crab-eating mongoose frequents watercourses, where it feeds on crabs, frogs, and small rodents, and sometimes goes fishing in the water.

**The Indian Mongoose.** In India, Assam, and Afghanistan dwells a smaller species, the Indian Mongoose, *Herpestes edwardsii*. It weighs about three pounds, and its colour is iron grey. The young, three or four in number, are born in holes dug in the ground by the adults. It is the Indian mongoose that was introduced into many of the West Indies Islands.

**Africa's Mongooses.** One of the largest of the mongooses is the **Grey Mongoose**, or **Ichneumon**, *Herpestes ichneumon*, found pretty much throughout Africa. Its overall length is forty-four inches; about half of this is the black-tipped tail. The grey mongoose normally travels about singly or in pairs, but as many as fourteen have been seen hunting in a pack.

This large mongoose preys on small mammals, reptiles, frogs, fish, and freshwater crustaceans. It got its name "ichneumon" ("the tracker") because it was believed to be especially fond of crocodile eggs, hunting them assiduously. Revered

by the ancient Egyptians, it was frequently mummified.

**The White-tailed Mongoose**, *Ichneumia*, of the central and southern regions of Africa, does not always have on its tail the white tip for which the animal is named; but may be quite blackish all over. It spends the day in its hole in the ground, coming out at night to prey upon birds and small mammals. The **Marsh Mongoose**, *Atilax*, a large, brownish creature, swims and dives well in the lakes and marshes it frequents, and feeds upon much the same kind of food as the ichneumon.

Striped mongooses exist in many forms, and the **Banded or Zebra Mongoose**, *Mungos mungo*, can readily be recognized by the numerous thin bands of alternating light buff and dark brown that cross its lower back and fade into finely mixed buff and black on its shoulders. This is a rather small creature that prefers to roam abroad during daylight. It goes about in troops of six or more and is most abundant near rivers and marshes. Its typical diet consists principally of insect life such as termites, beetles, and cockroaches.

When nature permits a creature to multiply greatly, as it has the mongoose, we often find it in many different sizes, some considerably smaller than others. The **Dwarf Mongoose**, *Helogale*, measures ten inches or less from nose to rump, and the tail is about eight inches long. This animal is coloured dark brown finely mixed with yellow. The dwarf mongoose travels about during the day, hunting in packs of fifteen or more. Largely an eater of insects, it varies its diet with fruit and small mammals.

A pretty little South African creature is the **Suricate**, or **Slender-tailed Meerkat**, *Suricata*. It is light grey or pale buff,

with broken dark bands crossing its lower back. This inhabitant of the grassveld and arid plains dwells sociably in burrows, from which it emerges in the daytime to sit up on its haunches like a ground squirrel, and look curiously about. Insects make up the greater part of its diet.

## Fossas

The **Fossa**, *Cryptoprocta*, once enjoyed a reputation for great ferocity—so much so that the single species in existence was named *Cryptoprocta ferax*. Occasionally there are reports that this sharp-clawed catlike animal attacks sheep and young cattle, and it is well known to the natives of Madagascar because of its raids on their chickens. But the old tales that ascribed to the fossa the bloodthirstiness of the lion and tiger are nowadays taken with a generous sprinkling of salt.

The fossa is a curiosity among the carnivores. This one species comprises a whole subfamily in the animal kingdom

and appears to represent a bridge between the weasel-cat family and the true cats. Harsh short fur, reddish brown or brownish grey in hue, covers its slender body. The legs are short and the body appears very long because it is so slender. (As a rule, the animal may reach a total length of five feet, with the well-haired tail almost half of this.) The claws are needle-sharp and hooked like those of a cat; the fossa can draw them in and out, too. On the ground it walks on the soles of its feet, whereas the cats, as we shall soon see, move about on their toes.

The trees are home to the agile fossa, which inhabits the rain forests of eastern Madagascar as well as the drier forests of the west. Here it preys upon birds and lemurs. It is most active at night, but is sometimes seen abroad in the early morning or late evening. Mostly it keeps to itself.

The fossa is the largest carnivore in Madagascar, where it takes the place of the big cats.

## Carnivores: 6

# Hyenas and Aardwolves

Hyenas scour the plains throughout Africa, Palestine, Arabia, and India in search of animal remains. These sturdy, unhandsome beasts are the bone-crunchers of the animal kingdom. Their teeth are massive and their jaws powerful enough to crack and crush the thigh bones of large animals like the zebra and even the buffalo.

Such eating equipment has its uses. Most people believe that hyenas are exclusively eaters of carrion. As a rule, however, few dead animals ever reach the actual putrefying carrion stage on the plains of Africa; often the best a hyena

can expect is a feast of bones.

Equipped with a keen sense of smell, the hyena can detect a carcass many miles away. It makes for any spot over which vultures are flying, being assured of the presence of a dead animal. To a large extent it depends on the kills left by lions and troops of wild dogs. Lack of speed prevents the hyena from becoming a habitual game destroyer but it will kill domestic stock.

Despite its powerful jaws and teeth, the hyena rarely attempts to defend itself. When cornered, it will try to escape rather than fight for its freedom. If escape is not

## Laughing Hyena

possible, it will play dead until its attackers drop their guard. Then it springs to its feet and dashes off.

Most hunters consider the hyena one of the most degraded of animals. That the hyena is reluctant to devour its own kind seems to indicate that it does have a moral standard. It is surprisingly free from body odours, and sniffs much

sweeter than a lion or a jackal. In fact, the natives readily eat the meat of the hyena and are keen to get the heart, believing that it will bring them courage. This is rather strange, since, as we have seen, the hyena seldom puts up a fight when the odds are against it, and is generally referred to as a coward. Not every animal can be a lion, however.

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## Hyenas

**The Spotted Hyena, or Laughing Hyena, *Crocuta crocuta***, is the largest and strongest of the scavengers. A full-grown spotted hyena may stand from two and a half to three feet at the shoulders and measure as much as five and a half feet in head and body length. Some weigh up to 175 pounds.

This robust carnivore is as hideous as its reputation. It has a broad, ugly face, large, rounded ears, a short tail, and heavy limbs. The coarse, scanty fur is grey or buff in colour, with a good many irregular blotches of brown or black. Even the posture of the hyena is ungraceful: the animal's front limbs are longer than its hind ones, and the body slopes downward from the high neck and shoulders to the foot-long coarse-haired tail.

The peculiarities of the hyena do not end here. Unlike most four-footed creatures, it does not trot, but paces—that is, the fore and hind limbs on each side of the body move forward together, producing a rolling gait much like that of the camel.

Under normal conditions the hyena does not hunt living healthy game but follows great herds of zebra and antelope and attacks the sick, the weak, the maimed, the aged, and the young. Where civilization has driven big game from large areas and the hyena is left without its natural prey, it will attack domestic sheep and cattle, but only when driven by extreme

hunger. Possessed of extraordinary vitality, it can drag a two-hundred-pound carcass as much as one hundred yards.

The hyena's gluttony, like its strength, is proverbial. Theodore Roosevelt tells of finding a hyena trapped inside a dead elephant. It had crept inside the carcass and gorged itself with so much flesh from the walls of the elephant's stomach that it was too fat to get out the way it had entered.

Daytime is for slumber, so far as the hyena is concerned. Its home is a burrow in the ground or a dark cave in the rocks. It is a heavy sleeper, and can be approached quite closely without being disturbed. Usually it lives in hilly territory on the margins of desert country, and descends to the plains to look for food at sunset, but first it visits a nearby pool to drink. Then the hunt begins.

Scarcely a night passes on the African veld when a traveller will not hear the strange cry of the prowling bone-crusher. Its voice is extraordinary and the sounds it produces are legion.

The hyena's characteristic howl is a crescendo beginning on a low, mournful tone and ending with a shrill, high-pitched note. When the animal approaches a carcass it utters an entirely different cry, the weirdest of all. It is a chilling, diabolical caricature of the human laugh, a hysterical cackle, which has earned the

African Elephant

Indian Elephant



Tree Hyrax

Mountain Zebra

R.P.

## Striped Hyena

name of "laughing hyena" for this beast. The hyena is a ventriloquist, and the sound offers little clue as to the exact whereabouts of the animal.

Although the hyena is solitary in its habits, when a kill is made or found, as many as nineteen or twenty of the animals may gather. Their loud quarrelling over the food carries far through the night.

The nursery for the young hyenas is a large hole in the ground. The pups, numbering two to four in a litter, are born in March or April, about three months after mating time. They are seal brown in colour, without any spots or stripes. After a month or two the fur becomes lighter in patches, leaving the characteristic dark spots. It is questionable whether the male plays an active part in raising the family.

Under natural conditions the spotted hyena has practically no enemies and has a long life expectancy.

The spotted hyena is found throughout Africa from Ethiopia and Senegal south

to the Cape of Good Hope. There is only one species, but six varying forms occur in different regions.

**The Striped Hyena, *Hyaena hyaena*,** is encountered in India, Palestine, Arabia, and from North Africa to Tanganyika. It is smaller than the spotted hyena, its head and body length being about three and a half feet, and its tail one and a half feet long; the average weight is about seventy-four pounds. This animal is soiled greyish in colour with narrow tawny and blackish stripes running across the body and legs. Its life habits are much the same as those of the spotted hyena.

An interesting example of how an animal takes up a specialized kind of existence is shown by the **Brown Hyena, *Hyaena brunnea*,** also known as the **Strand Wolf** or **Strandjut**. This South African species (it does not range north of the Zambesi River) haunts the beaches and shore lines, where it feeds on marine refuse. It is more timid and retiring than

## Spotted Hyena

**This, the largest of the hyenas, ranges over much of the African continent.**



## Aardwolf

the spotted hyena, and is not likely to attack human beings. Although best known as a haunter of seashores, it also occurs far inland.

The brown hyena is a little smaller and more lightly built than the spotted hyena. Nevertheless, it is a powerful brute, and one of its kind caught in a trap lugged away the sixty-pound log to which the mechanism was attached, dragging it four miles during one night.

For a hyena, this one has extremely long hair (about ten inches long) on its back. It has a coarse blackish-grey coat, and stripes only on the legs.

## Aardwolves

**The Aardwolf**, *Proteles cristatus*, looks like a small hyena, but it is very mild and inoffensive in its character. Common through South and East Africa, and north to Somaliland, it lives in open sandy plains, scrubby brush country, and rocky hills.

For the aardwolf, a hole in the ground is home. This "earth" is sometimes dug by the animal itself, but more often it moves into a deserted ant-bear's den. Now and then a number of aardwolves may dwell in the same burrow. It was because of the animal's habit of living in the ground that it acquired its Dutch name, aardwolf ("earth wolf"). It is not a wolf but, as its appearance and posture suggest, a close relative of the hyena.

Because the aardwolf spends the day underground, it is frequently overlooked in places where it is quite abundant in numbers. It has a pointed muzzle and large, erect ears. Its long fur is coarse in texture; it is light grey or buff in colour, with bands of dark brown running across the back.

The word *cristatus*, in the aardwolf's scientific name, means "crested," and this

creature has a sort of mane—a distinct crest of long hairs running down the back. When attacked, the aardwolf erects its mane. This gives the animal a formidable appearance that belies its essentially timid nature. Under provocation, the aardwolf also emits a malodorous fluid from its anal glands.

An animal's teeth will tell you much about how it gains its livelihood. The aardwolf's mouth is quite unlike the hyena's: the jaws are weak, the teeth small. This is hardly the equipment for a tearer of flesh, much less a cruncher of bones, and in fact the aardwolf is rather specialized to an insect diet. When the aardwolf sets forth on its nightly hunts, much of the food it seeks is white ants, which it consumes in great masses. Other insects and scraps from kills left by the larger carnivores complete the aardwolf's diet.

Aardwolves bear their young in a burrow in November or December. There are two to four babies in one litter, and more than one female and her young may occupy the same den. The aardwolf is fairly sociable, and packs of half a dozen or more may travel about in search of food, though pairs of hunters or single hunters are equally common. The aardwolf's cry is much like the hyena's.

The aardwolf, or maanhaar-jackall as it is sometimes called, has lived up to thirteen years. Only one species exists, with six geographical forms. The animal is a little more than two feet long and it has a bushy tail some six inches in length. At the shoulders it stands about twenty inches. The genus name, *Proteles*, means "forward perfect"—the aardwolf's forefeet, following the basic mammal pattern, have five toes, whereas the hyena only has four on each foot. With the hyenas, the aardwolves make up the family Hyaenidae.

## Carnivores: 7

# The Cats

Cats are springers. Just as dogs are runners, relying upon sustained speed to overtake and bring down their prey, cats are masters of the art of leaping. From a running, walking, standing, or sitting position, they can suddenly catapult themselves into the air and hit their quarry with a stunning impact. They land with claws extended and jaws wide open, teeth bared ready to sink into the victim's throat.

In the world of flesh-eaters, the cats (family Felidae) are the masters of their trade. They have the longest and sharpest canine teeth of all the carnivores. In cutting through flesh and sinew, the side teeth operate like shears: the knifelike edges in each jaw slice up and down, cut past each other, but do not meet. (There are, in the mouth of a cat, no bone-crushing teeth such as we find in a dog or a bear.) The tongue is wonderfully fitted to help out. Its upper surface is rasplike, and the largest cats will draw blood by merely licking the surface of the skin.

Cats have the sharpest claws of all the mammals. Perfect cutting tools, they are compressed on each side and hooked. With the exception of the cheetah's, the claws of the cats are retractile—that is, they can be withdrawn at will into sheaths in the paws, or they can be extended for action. Thus the animals can trot along silently on their foot pads, keeping the claws safely protected, then bring them out as sharp as ever when there is work for them to do. A dog's claws are always extended.

All this marvellous equipment for

getting their livelihood would be worth little to the cats, which hunt mostly at night, if they could not detect their prey at a distance. Here, too, they are well provided. They have moist noses, like dogs, and can smell and hear extremely well.

In a cat's ears there are hairs that catch minute vibrations in the air and tell the animal of movements it has not even seen. Its whiskers are also sensitive feelers that work in much the same way, registering the slightest contact at the tip, and transmitting the sensation to the nerves at the root.

Everyone knows that cats—tame or wild—can see in the dark. But just how do they do it? What, too, is the cause of the familiar green glare in the eyes of cats at night?

This glare is known as eyeshine. The lining at the back of a cat's eye is coated with masses of minute particles called guanin, which have a metallic lustre of silver or gold. When light strikes the guanin, the particles amplify and brighten the dimly lighted picture focused on the mirror or retina inside the eye, for better visibility. The slightest trace of light is caught by the guanin, and a glow is created by it.

The purpose of guanin is not to reflect light and illuminate the outside world. It is only when bright artificial light is suddenly directed into the eyes of a cat at night that the overabundance or surplus of light is reflected back. Given time, the luminative particles will retreat into their cells and the eyeshine will stop.

## Wild Cats

The dark pupils of the cat's eyes dilate at night, to allow all possible light to enter. It is interesting to note that these

hunters of the gloom have the largest eyes of all the carnivores. Small wonder that you rarely catch a cat really napping!

### The Lesser Cats

**The European Wild Cat, *Felis silvestris*,** has retreated as civilization has moved forward. Today this savage creature still may be seen in Scotland and across Central Europe into Asia Minor and northern Asia. It resembles a tabby cat in size and general colour (perhaps it is one of its ancestors) but is more heavily built and more powerful. The wild cat of Scotland is about two feet long, with the tail half as long again.

The European wild cat chooses for its home rocky and densely wooded regions. Its den is hidden in a thicket or crevice in the rocks or under an old tree stump. A fierce, ill-tempered beast, it haunts the shores of lakes and rivers at night, searching for rabbits, grouse, mountain hares, small birds, and, occasionally, fish. It stalks its game by sight until within a short distance. Then the wild cat puts on tremendous speed, making the final attack as unexpected as possible.



**The Jungle Cat or African Wild Cat, *Felis chaus*,** is one of the most familiar cats of India and North Africa. It ranges through southern Asia as far east as Thailand and Yunnan China. This feline haunts the brush jungles, tall grass, and reed beds near rivers and lakes but mostly in areas that are comparatively dry. The author found it common in the arid regions near the Caspian Sea in Persia and saw several asleep on dry mud banks in broken country.

About the size of a large house cat, the jungle cat is coloured grey to tawny and has a distinct crest of hairs along its back. It has long legs and is very swift and strong for its size. Its food is mainly small mammals and birds up to the size of the peacock. The discovery of the quills of the porcupine in its feet indicates that it occasionally attacks this animal. An African subspecies, the **Egyptian Fettered Cat**, or the **Swamp Cat**, was tamed by the ancient Egyptians, and mummified cats of this type are found in the Egyptian tombs.

**The Kaffir Cat, or Grey Wild Cat, *Felis lybica*,** is the common wild cat of Africa, from Egypt to the Cape of Good Hope. It looks like a tabby cat, its fur being tawny or light buff in colour as a rule.

The kaffir, like almost all the cats, keeps to itself, remaining under cover in dense brush or tall grass. It is, however, a husky creature and can defend itself against almost any dog. When at bay, it erects the ruff around its neck and presents a most formidable appearance to its

### Scottish Wild Cat

foes, however large they may be.

**The Black-footed Cat, or Sebala Cat,** *Felis (Microfelis) nigripes*, is the smallest of the wild cats. It is only fourteen inches long, plus a six-inch tail. Native to the arid plains of the Kalahari Desert region and South Africa, it lies up during the day in the hole of the spring-hare or some other burrowing animal.

A shy creature, the black-footed cat usually remains savage in captivity, though it will live on amicable terms with other cats. It breeds readily with domestic cats and other small wild species of typical cats. The black-footed cat's litter, like that of many others in this group, contains two or three kittens.

**The Ocelot,** *Felis (Leopardus) pardalis*, is an American jungle cat that loves darkness. At home in the gloom of dense forests, it never leaves its lair until the evening light is gone and the dusk has turned to darkness. The darker the night the further the ocelot will prowl. Even moonlight nights impede its activities.

Usually the ocelot spends its time on the ground, in dense cover on brush-laden hillsides. But it is also fond of climbing in the trees: it often goes aloft to rifle nests and may even sleep there during daylight hours. That it can find its prey in the branches of the dark forest is a tribute to its keen senses. It can climb easily and quickly enough for its own purpose, though it is not in a class with the squirrels and monkeys.

This long, lithe animal will seek refuge in a tree when danger threatens. However, it does not leave the ground at the first yap of a pack of hounds. It can run like a fox and knows how to backtrack and double-cross its trail.

The ocelot feeds on almost any kind of animal life that it can master, including—



#### Ocelot

**A wild jungle cat found through much of South and Central America.**

besides birds—rodents, snakes, lizards, and opossums. On one occasion an ocelot killed a large boa, six or seven feet long, and, when discovered, had eaten the head and neck. An ocelot will consume from three to five pounds of meat a night.

For its den the ocelot nearly always selects a rocky cave or, failing this, a hollow tree. The home, wherever it is, is lined with great care. The animal chooses a bedding of dry grass, twigs, and the like, and chews it till it is soft and pliable, for this creature likes its comfort.

The mating season is probably about June. The kittens, nearly always twins, are born in September or October, with their eyes tightly closed. From the tip of its nose to the end of its tail the animal is three or four feet long.

**The Serval,** *Felis (Leptailurus) serval*, a beautiful thirty-four-pound golden buff-coloured cat, marked profusely with bold black spots, is found over most of Africa south of the Sahara. Its long legs are a superb adaptation for an animal that lives by running on the ground. This creature haunts the reed-fringed lakes and rivers where waterfowl and hares are to be had. There are two distinct

## Yaguarundi

species, the **Large Spotted Serval** and the **Small Spotted Serval**.

**The Flat-headed Cat**, *Felis (Ictailurus) bianiceps*, smallest of the wild cats in tropical eastern Asia, actually prefers eating juicy fruit to catching rats and mice. (Lions often devour ripe watermelons in the Kalahari Desert, but this they seem to do more to obtain liquid than to satisfy their appetites.)

**The Fishing Cat**, *Felis (Zibethailurus) viverrina*, has turned from the hereditary feline practice of hunting and has gone a-fishing. Having a cat's dislike of getting wet, it does not enter the water. Instead, it crouches on overhanging banks and with a sweep of its paw scoops up fish as they sail unsuspectingly by. Fresh-water molluscs are also eaten by this short-limbed, sturdy, spotted cat (it is about two and a half feet long). It will resort to killing animals and birds where fishing does not fill its needs, and has been known to carry off dogs.

**The Marbled Cat**. The superb long tail of the Marbled Cat, *Felis (Pardofelis) marmorata*, tells us that this handsome creature lives in tall trees; the large irregularly spaced dark blotches that mark its coat are indiscernible against the tracery of dark forests. The marbled cat travels the dense jungles from the Himalayas east to Borneo, where it becomes a mahogany red and is known as the Bay Cat.

**The Golden Cat**. Among the rock-bound wastes of south-eastern Asia, from Tibet to Malaya, lives one of the largest and most attractive of the medium-sized cats, the Golden Cat, *Felis (Profelis) temminckii*. The bright reddish brown coat of this creature blends perfectly with the

rocky background of its home. It is an important animal to the Chinese, who call it *huang pao*—"yellow leopard"—and pay a high price for its bones in medicine shops. A related species of golden cat ranges the forests of West Africa.

**The Rusty Spotted Cat**. In the broken bush country of southern India and western Ghats is the home of the Rusty Spotted Cat, *Felis rubiginosus*. Its rust-coloured spots are arranged in rows or stripes that make this cat almost invisible as it steals silently through the fields of tall grass.

**The Desert Cat**. At night on the great deserts of western India that stretch westward to northern Africa, the gerbils and numerous other rodents are out to feast on the few blades of grass and seeds that are thinly scattered over the sandy wastes. Here the Desert Cat, *Felis constantina*, a house-cat-sized species with pale sandy-coloured fur, marked with numerous small black spots, keeps their number in check.

**The Rock-Dweller**. The **Manul** or **Pallas Cat**, *Felis (Otocolobus) manul*, is a small spotted cat that dwells in the high mountains of Tibet and northward into Siberia. Its eyes, placed high in the face, and the low-set ears give it a most ferocious appearance. So far as we may gather, the position of the eyes is an adaptation for peering over edges of rocks in search of prey, thus exposing the smallest amount of the head possible.

**The Yaguarundi or Eyra**, *Felis (Herpailurus) eyra*. This short-legged, long-bodied cat with a lengthy tail resembles a weasel more than a cat and fills much the same position in tropical America

that the weasel cats do in the Old World. In Mexico it is known as the Otter Cat in tribute to its readiness to take to the water.

The yaguarundi is only two feet long but it is a ferocious, untamable creature. Its home is in the tangled thickets and dense brush of the plains as well as the forested country from Texas south to Argentina. It is one of the few species that come in two distinct colour phases (that is, it may have a coat of one or the other of two colours): one a speckled grey or black and the other a bright, rusty red.

**The Andean Highland Cat**, *Felis (Oreailurus) jacobita*, of South America, takes the place of the snow leopard in the New World; it is pale grey in colour and more or less marked with the ocelot's stripes. It is a big cat, too, nearly three feet long without its lengthy tail.

On the upland grass plains that stretch from Patagonia to northern Argentina is the **Pampas Cat**, *Felis (Dendrailurus) pajeros*, a large yellowish cat with rather coarse fur. In the extreme southern part of South America there is **Geoffroy's Spotted Cat**, *Felis (Oncifelis) geoffroyi*, while the **Margay**, *Felis (Noctifelis) wiedii*, a much smaller cat liberally marked with black stripes and spots, lives in the forests of Paraguay and north to Texas. A cat with small spots—the **Tiger Cat**, *Felis pardinoides*—is the smallest of the American wild cats. It haunts the forests from Costa Rica to Chile.

## Lynxes

**The Canadian Lynx**, *Felis (Lynx) canadensis*, dwells in the evergreen forests of the north country of Canada, where fallen timber and dense windfalls present an almost impenetrable barrier to man.

A black-barred side-ruff and ears heavily

tufted and edged with black frame this feline's solemn-eyed face and give it a handsome, almost regal appearance. But gaunt, lanky hindquarters, bobtail, and exceptionally long hind legs and oversized feet are incongruous with the elegance of the animal's mien. Although the large, padded feet make the going across the snow easier, the lynx is an awkward animal when it speeds up to a gallop.

Despite its name, the Canadian lynx ranges as far south as Colorado and Oregon in the west, northern New York in the east. It is much sought by trappers and hunters for its long, soft fur, which is grizzled or greyish brown in colour and spotted with black. The pelt is highly valued in the fur trade, and is warm as well as handsome.

Famous for the sharpness of its sight, the lynx usually hunts at night. It feeds largely on the snowshoe rabbit, but when the supply of these animals fails, as happens from time to time, many of the cats die of starvation. Sometimes the lynx ekes out its diet with beaver, and it is a deadly enemy of the fox. It will prey on deer, but these swift, massive animals are no easy quarry for the three-foot-long lynx. It prefers to creep up on them while they are lying down, and then spring at the neck, holding on till the victim is dead. The lynx can strike with unbelievable swiftness at the crucial moment.

Oddly enough for a cat, the lynx is not averse to getting itself wet. Those who have watched it say that it takes to the water without being in any sense driven, and that it swims as well as a dog. One lynx was seen crossing the arm of a lake two miles wide.

During the mating season—in late winter or early spring—there is considerable caterwauling as the tom lynxes fight for a mate, but usually there is

## Bobcat

more sound than actual struggle. About two months after mating time a litter of kittens—generally four—is born in the shelter of a thick windfall or under an overhanging ledge. Blind at birth, they open their eyes for the first time when ten days old. Their mother suckles them for two or three months, when they are old enough to travel with her on her hunting trips.

By midsummer the kittens are weaned, and begin the task of hunting for themselves. The family stays together until the autumn, and may continue together until the end of the year, by which time the kittens are fully grown. But when the mating season rolls around again, all family ties are broken and the young are ready to seek their own mates.

Life in the wild is hard for the lynx. Although it does not have many enemies, food is often scarce and the animal may have to risk its life to get it. Under favourable circumstances it might live fifteen years, but that would be a record.

Much like the Canadian lynx, but smaller, is the **Bay Lynx, Bobcat, or Wild Cat, *Lynx rufus*** ("red lynx"), as it is variously known. This creature has brown fur, indistinctly marked with darker spots and lines, but its feet are more normal than the Canadian lynx's. Its range is not so northerly, extending from southern Canada into Mexico. Varying from this animal in size and colour are many North American bobcats that all belong in the genus *Lynx* but dwell in restricted localities.

The bobcats have a reputation for ferocity that is more a matter of seeming than of reality. Their usual fare is rats, mice, rabbits, and snakes, and they are most unlikely to attack man. Sometimes they prey on small domestic stock and poultry.

Bobcat hunting is a popular sport in the



### Canadian Lynx

**Lynxes are identified by their stubby tails, cheek whiskers and ear tufts.**

south-eastern United States. The animal is not easy to tree; it will give a pack of fast foxhounds a good run for their money, sometimes eluding them for hours. When the bobcat can no longer escape, it strikes out ferociously at the dogs. Though they generally put it out of action, they have wounds to nurse and lick.

Most of the bobcats appear to have no fixed breeding season. The mother bears two to four babies at a time in her den, which may be in a cave, dense shrubbery, or a hollow log.

**Old World Lynxes.** The Old World has its lynxes, too, though man, the hunter, has made them much scarcer than they used to be. The **European Lynx, *Lynx lynx***, closely resembling the Canadian lynx, is found throughout the wooded portions of Europe and Asia from the extreme north to the Alps, the Pyrenees,

and Tibet, and from the Atlantic coast east to the Pacific coast in Siberia. There are a number of regional lynxes that vary in colour from a Chinese variety that is reddish brown with dark spots, to yellowish brown or brownish grey in the typical European lynx.

**The Caracal**, *Felis (Caracal) caracal*, is among the most active of the feline tribe. Except for the cheetah, it is the least catlike of all in its movements.

The natives of India often train this animal for hunting because of its remarkable speed and its skill in jumping. Trained caracals are let loose amongst pigeons feeding on the ground and one cat may strike down ten or twelve before they can escape by flight. The cat will spring five or six feet in the air to knock down a pigeon.

"Caracal" means "black ears" in Turkish, and this slender, lynx-like animal does indeed have large, blackish ears that are tufted at the tip. Its fur is rather short and tawny brown in colour. The tail is not long (nine inches) compared to the body (about two and a half feet). The animal may weigh up to forty pounds and stands high on its long limbs. This handsome cat has eyes that shine like bright emeralds, due to the lustre of the enlarged pupils; the iris is an amber yellow.

The caracal is essentially a creature of hot, dry country. In Asia it is found over the greater part of Arabia, as well as in Turkey, Syria, Iraq, and the Peninsula of India. In Africa it ranges from the Mediterranean Sea to the Cape of Good Hope, in all types of country but the thick tropical coastal forests. Its den may be a hollow tree, a crevice in the rocks, or a hole in the ground (a porcupine or aardvark burrow), and here it bears its two to five young. The caracal preys on

peacocks, cranes, partridges, hares, and occasionally gazelles.

## The Big Cats

**The Cougar or Puma**, *Felis concolor*, is a fear-inspiring sight to the traveller who glimpses this great, powerful beast crouching in the branches of a tree in a deep forest. Its eyes seem to glow like fire in its small, round head. The lithe six-foot body, covered with short, tawny or greyish-brown fur, and the long, heavy tail are vibrant with deadly energy. Those who have heard this feline's weird drawn-out shriek declare it to be the wildest and most hair-raising sound that ever broke the stillness of the American wilderness.

The cougar is a big-game hunter. Usually it spends the day sleeping in some rocky cavern or sunning itself on a high, warm ledge. After dark the cougar leaves its lair and sets forth on a silent hunt. More than once it has been seen swimming across rivers at least a mile wide. It may range twenty miles through the night.

This big cat's natural prey are the deer and sometimes the elk, but it will track down other animals like the skunk, and its victims often include domestic stock—cattle, sheep, horses, and pigs. Stalking the doomed animal in the shadows, the cougar approaches soundlessly for the final rush. Now it gathers its feet under its body and humps its back. The taut muscles burst into action. In one, two, or three quick bounds, the cougar is upon its quarry, hurling it to the ground and piercing its throat or neck with long, murderous fangs.

The cougar is no mean jumper; it can spring twenty feet in one leap. It has no fear of dropping from a height, and has been known to jump from a perch sixty feet high without doing itself injury.

This animal, we see, has enormous

## Leopard

power concealed in its graceful body. It can drag a victim that weighs five times its own 160 pounds for a good one hundred yards. If the kill is large, the cougar will eat its fill, then cover the remnants with brush. Later it will come back and make a second or a third meal of the carcass.

Except for the jaguar, the cougar is the largest of the New World cats. The two are almost irreconcilable foes. The jaguar is bigger and more powerful, but it cannot match the cougar's remarkable agility. The odds are naturally in the jaguar's favour, yet frequently it loses the bout.

Ferocious the cougar certainly is, but not when it comes up against man. Authentic accounts of attacks upon human beings by this big cat are scarce. It evinces considerable curiosity about people and their actions and will prowls about an abandoned camp or dwelling. But let somebody appear on the scene and the cougar moves off into the woods.

Because of the damage it does to domestic stock, this big cat is extensively hunted. The hunters use dogs to corner the cougar. When it sees no other way out, the animal takes to a tree. Such a move is likely to be fatal for the cougar; a well-placed shot will quickly finish the hunt.

The mating season of the cougar is very irregular; this cat breeds at almost any time of the year. About three kittens are born some ninety days after a brief courtship.

At birth, a kitten measures about twelve inches and weighs one pound; it is blind and covered with fine yellowish fur spotted with black. The kitten opens its eyes on the eighth or ninth day and cuts its first teeth about ten days later. The spots usually fade from the fur when the animal is six months of age. The kittens stay with their mother until they

are a year or sometimes two years old. A long life among the cougars is twenty years.

**The Leopard, Panther, or Golden Cash**  
**Leopard**, *Panthera pardus*, outstrips both the lion and the tiger in pure malevolence and savagery. The smallest of the three, this cat is barely inferior to its two big cousins in fighting ability. The natives of Africa often say they would rather face a lion than a leopard any time.

This wary, treacherous beast is much more given to climbing and lurking in the trees than either the lion or tiger. It can leap more than ten feet in the air and run up the side of a tree with astonishing speed. Sometimes it drags its prey up into the branches with it, so that it can dine in peace, away from other marauders.

Although the leopard may be about in the daytime, it is most active in the darkness. A clever tracker, a patient waiter in ambush, it preys on domestic cattle and sheep, deer, antelope, monkeys, and small wildlife. It knows better than to attack a pack of baboons, for these can defend themselves; a single baboon, however, might not be so fortunate.

The panther will spring after its quarry, overtaking it in a few long leaps. It can subdue its smaller victims in a few instants by breaking their spines, strangling them, or tearing open their throats.

In intelligence the leopard ranks high; it is quick to learn, and retains anything that is to its advantage. One thing it learns early is ruse, and it occasionally resorts to the subtlest and wiliest subterfuge to make a kill.

With a deer in the neighbourhood, the leopard has been observed to roll on the ground and to indulge in various other playful antics. The deer, its curiosity aroused, moves closer, but remains suspicious. Still the cat carries on, and the

## Clouded Leopard

deer, in wonderment draws nearer in order to see better. Those last few steps are the ones the trickster has been waiting for—they bring the intended victim within easy striking distance.

In the warmer and some of the colder parts of the Old World, the leopard is far commoner than the lion or the tiger. It ranges from the Black Sea in Europe east to Burma and the Malay Peninsula, including all of India and Ceylon, and north into Amurland, Siberia. In Africa it is found almost everywhere except in the Sahara.

Leopards vary greatly in size. Some are as long as nine feet, including the extensive tail; others are seven feet in total length or smaller. Their average weight is about one hundred pounds. Twenty years is as long as a leopard is likely to live. It bears two to five young in a litter.

Originally people believed that the leopard and the panther were two different animals. However, the difference proved to be only one of size or sex: the male, the larger of the species, was the so-called "panther" and the female the "leopard."

The entire body of a typical leopard is profusely covered with large and small black spots, evenly scattered over the pale yellowish-buff fur. The spots are arranged in groups of four or five in a circle, or rosette, about a centre of somewhat darker shade than the main body colour. But we find many variations among the leopards, the most striking being a jet-coloured creature known as the Black Panther, which is fairly common in Ethiopia and the East Indies.

The kind of coat a leopard wears will depend very much upon the climate of its native land. Leopards in hot countries have short, close fur, while, in the colder regions, especially Siberia, the hair is long, thick, soft, and deep.

It is in Siberia that we meet the handsomest of all these cats, the **Siberian Leopard**, a magnificent creature with bluish-grey eyes and long-haired spotted fur almost pearl grey in colour.

**The Clouded Leopard.** Two of the most attractive of all the cats are called leopards but are not leopards at all. One of these is the Clouded Leopard, *Panthera (Neofelis) nebulosa*, of south-eastern Asia. It has thick, soft, and full fur, beautifully decorated with spots and stripes. A savage and extremely wary creature, it inhabits the densest of forests and is active only at night, so that it is rarely seen.

Although only about three feet long, this beast is powerfully built and has relatively longer canine teeth than other cats, so that it is capable of killing fair-sized game, including deer, though generally it preys on smaller mammals and birds.

The clouded leopard is not apt to attack man unprovoked, but there is an instance where a clouded leopard that had



Leopard

## Lion

killed several head of cattle started to stalk a native boy; fortunately the boy was able to split the skull of the spotted greyish-brown cat with his knife.

**The Snow Leopard.** The other "leopard", that is not a leopard is known by various names: Snow Leopard, Ounce, or Irbis, *Panthera (Uncia) uncia*. It is often looked for by men who brave the cold, high altitudes from the Himalayas north to the Altai Mountains, where it dwells. Its superb coat of deep, soft fur, pale grey or creamy buff, ornamented with large rosettes, or broken black rings, is a grand reward for the efforts of any hunter.

The snow leopard is about the size of an average leopard but less powerful. It preys on mountain sheep, goats, hares, and other small game.

**The Lion, or Simba,** *Panthera (Leo) leo*, has for a long time been known as the King of Beasts. It certainly looks the part: it has size, a dignified and noble face, and what would seem great pride. Then, of course, it wears a long, stately mane around its neck, which adds to the beast's air of majesty.

But if the lion is a king, it is not one by virtue of savagery. On the contrary, this animal usually has a friendly nature. All other cats travel alone or in pairs; the lion is the only one that moves about in a group or "pride." Occasionally you may see a lion by itself, but these creatures love company, and more often there are five or six together.

The lions will not fight over prey. As many as six male lions have been observed feeding on one kill, and other than a resentful growl when two got hold of the same chunk of meat, there was no display of ill-feeling. At one time, on the Serengeti Plains of East Africa, the author had twenty-five lions, including lionesses and

cubs, feeding around him, some not ten feet away. They all got up and left peacefully, without haste, when he stood up.

The lion favours open broken country and grassy plains rather than dense tropical forests. In southern Asia today it is a rarity, but it is still found throughout most of Africa south of the Sahara Desert, being more or less plentiful where there is an abundance of big game. During the day lions often lie up in clumps of tall elephant grass or tangled brush. On the open veldt they are seen resting without any cover in broad daylight, for the royal family of the carnivores has few natural enemies to fear.

Although these great beasts may be active by day, their working hours are chiefly at night. The lion hunts the larger game such as waterbuck, wildebeest, and kudu, but it seems to prefer the zebra.

Frequently, the big cat lies in wait for its prey near water holes and grazing grounds. In attacking, the lion creeps stealthily on its quarry, coming up from the side or rear. Its head down and its tail erect, it utters low growls. It may be one hundred feet off when it breaks into the final rush, and it dashes toward its prey at a speed of about forty miles an hour or more.

In its attack on a zebra, an experienced lion will gallop alongside the animal and slap it on the neck with its mighty paw. Then the king of beasts slows down and waits for the zebra to fall. The lion's blow may not cut the skin, but it is delivered with such accuracy that it will dislocate the zebra's neck. More often, the lion sinks its teeth into the neck of its prey. With one paw hooked on to the victim's shoulder, it reaches with the other around the animal's head and twists it back, throwing the zebra to the

## Lion

ground and breaking its neck.

Not nearly so bloodthirsty as some of the other big cats, the lion never destroys other animals for the fun of it. A lion kills to live: it kills only when it must eat, and then only one animal at a time. A single carcass will satisfy a lion's hunger for several days.

Normally when a lion has brought down a victim, it feeds on the spot. Afterward it sits close by to guard the carcass from thieves. In a nearby tree, vultures will settle and wait patiently for the lion to leave. But the lion remains until it has made a number of meals off the kill. Then the vultures and the hyenas close in.

The lion is often said to take a single mate. So far as we know, its state of wedded bliss may last a year or longer. The animals definitely do not mate for life, and some males are polygamous.

The lions have a variable breeding season. About 108 days after the mating, four cubs (the average number in a litter—though six are not unusual) are born. They are striped and thickly spotted, but their markings fade as the animals mature. Some, it has been said, have their eyes open at birth, but usually they are closed until the sixth day. In size the newborn babies resemble adult house cats.

The cubs are nursed until they are three months of age. Teething is a painful experience, and they may die in the process if separated from the parents. The cubs are not able to kill for themselves until they are a year old (at this time they are big enough to be on their own), and the mane does not begin to show until the male is three. Often the lion will supply the lioness with food while she is nursing newborn cubs, and will bring game to feed the growing family.

When half-grown, the whelps are expert climbers. They lose this skill as



they grow older and heavier. Occasionally one may see a full-grown lion climb into the lower branches of a tree, but this is unusual.

When five or six years of age, a lion is in its prime. The average lion has a life span of fifteen years, but a long-lived one may reach the age of twenty-five.

Lions are big fellows. A large male may weigh five hundred pounds and stand about three feet or more at the shoulder; such a beast measures seven feet in length, exclusive of its three-foot tail. The lioness, smaller and less powerful than her mate, will weigh up to three hundred pounds.

The coat of a lion is short haired and coarse, and uniformly tawny or pale sandy-brown in colour. The tip of the tail is tufted with dark-brown or black hairs, and completely hidden in it is the so-called "spur" or "claw," a naked, horny patch of skin.

A lioness almost never has a mane. In the males, this growth of long hair is quite variable. Most wild lions possess only a scant, ragged, and straggly shock of hair. In menageries, particularly, in northern climates, they are more likely to show the full, luxuriant ruff we com-

## Tiger

monly associate with them.

Although the lion is famous for its roar, the sound is almost never heard during daylight hours. But every evening after sunset, and throughout the night, the big cat periodically utters its ferocious, sounding grunts. "Uuummph-uuupf-mmmff" comes close to recording a typical, less forceful roar in words—if you want to give a realistic imitation, try producing these sounds from deep down in your throat.

**The Tiger,** *Panthera (Tigris) tigris*, outdoes the lion in acts of brutal savagery and feats of power. Or that, in any event, is the conviction of men who have hunted or trained these two beasts. Still, both are almost of a size, and the tiger more nearly resembles the lion than any other member of the cat family.

The most striking differences between the two animals are the striped coat the tiger wears, and its lack of a mane. An old tiger will grow a rich ruff of long hair on its cheeks, but never a mane. Never, that is, unless it is half a lion. So closely related are the lion and the tiger that they may crossbreed in captivity.

You may have seen the interesting offspring of such a match in a zoo: the cross usually has stripes and will sometimes, when it reaches adulthood, sport a mane. A cross between a male lion and a female tiger is known as a liger; vice versa, it is a tigon (or tiglon). These hybrids are not common, however, for the tiger will rarely breed in captivity.

The tiger is the typical big cat of Asia. It lives as far north as Amurland, in Siberia, as far south as India and the Malay Peninsula. It is not native to Africa, and the closest it gets to Europe is the Caucasus, where people still report encountering it from time to time in the Elburz Mountains south of the Caspian

Sea. Thus it is quite correct to picture the tiger as a giant cat slinking through the bush and the tangled growths of the steaming tropics—but remember that not all tigers will conform to this image. In its snow-covered winter homeland the Siberian Tiger must face very low temperatures.

A born climber, the tiger is a creature of the forests, preferring dense underbrush to big timber. Here its stripes seem to serve as camouflage, blending in with the alternating dark and light of the woodland. The stripes also harmonize neatly with the dark and the dry grass on which the tiger rests. Crouching in the shade of the foliage, where it seeks to avoid the heat of the tropical day, the animal is not easy to detect. It favours places where there is good cover, and where it may find water without travelling far.

The more things an animal can do, the better is it equipped to survive. To its considerable advantage, the tiger is one of the cats that can swim. (So are the lion, the lynx, and a few others.) It shows no qualms about leaping into a stream. If it observes prey on the other bank or on an island in midstream, it will swim across at a good rate. With hunters at its heels, it often saves its life by taking to the water. The animal is an extraordinarily good jumper, too—it can cover fifteen feet in a single bound.

The tiger has no fixed mating season. The young—two to four make up the average birth—come into the world about one hundred days after the courtship. Newly born, the kittens weigh some two or three pounds, and their eyes are sightless; the little cats cannot see before they are two weeks old. A thoroughly devoted parent, their mother watches over them with great tenderness, nursing them on her milk until they are capable of devouring meat. Anyone who tries to

take the kittens from her will have to fight for his life. What role the father plays is not clearly known.

When the kittens are about six weeks old, they may begin to travel with the mother as she goes about her duties as flesh-winner for the family. On hunts or at rest, they pass a sportive kittenhood, playing and chasing their tails like cats the world over.

But by the time they have reached the age of six months or so, the little cats must look to putting aside kittenish ways; now they are big enough and strong enough to apply the tiger techniques of hunting they have learned from their parent. The kittens start with smaller game, like young pigs, and become increasingly adept at springing upon their prey from ambush and slaying it with a quick bite in the neck. They are a year old before they are able to shift for themselves. Although tigers are not social at other times, the family may stay together until the young are nearly two years old.

Tigers slow down as they get on in years, and they do not kill so readily. Their teeth wear down and their power diminishes in time; they must learn to content themselves with less. But a young tiger is supercharged with vitality; it appears to take a special delight in killing and at times exhibits a nature that is extremely bloodthirsty. If the occasion presents itself, the animal will slay as many victims as it finds available, without regard for its needs. And those needs are not small, as witnessed by the fact that a zoo tiger requires ten pounds of meat daily to keep its great body pacing back and forth in confinement each day.

For many generations tigers have bedevilled the poor farmers of India. In that traditionally hungry land, all it takes to undo a village is the presence of a tiger in the neighbouring woods.

Under cover of darkness, the animal will steal forth and kill and carry off a treasured sheep, cow, or calf. If the carcass is of good size, the tiger may not be heard of again for several days. It rests in some hidden place, and then repeats the kill. But when nothing remains of the kill, hunger drives the great beast out again, and the village suffers another loss. This may go on for some time, since the peasants regard the tiger with superstitious dread, and are often slow to take action against it. In a single year the Bengal tiger is reported to have killed sixty thousand sheep, horses and other livestock. Tigers also prey upon deer, antelopes, and wild pigs, but in such instances the big cats actually do man a service, since these vegetable-eaters often cause serious damage to crops.

Although tigers are not man-killers by nature, now and then they, like lions, acquire a taste for human flesh. This is especially true of tigers that are old, infirm, or crippled. Lacking the strength to cope with their natural prey—some intended victims, like the buffalo, have powerful horns, and are quite capable of killing the big cats—these older animals may discover that man is a helpless creature, relatively speaking.

When once a tiger takes to killing man, it usually becomes a persistent menace to the local population. In India, in some districts, between two and three hundred natives have been slain in a single year, close to a thousand in the whole country. Many villages have been deserted entirely because of the large numbers of deaths caused by these fearful man-eaters.

Although tigers are not found over nearly so wide a range as lions, they show much more variation from place to place. The typical **Indian** or **Bengal Tiger** weighs about four hundred pounds. It may measure nine feet or longer (one-

## Jaguar

third of this is the tail). Long, narrow black stripes mark its limbs and body, which are tawny yellow in colour, fading to whitish on the under parts. The **Caucasian Tiger** has brownish stripes, while the fur of the **Siberian Tiger** is lighter in colour and, in keeping with the climate, the hair is longer, thicker, and more luxuriant. Occasionally, a completely black or white tiger is born in an average litter.

The tigers of India and the more northern parts of the range are the largest and strongest of all. The Siberian tiger, giant of the species, reaches a total length of over thirteen feet and, if good and fat, will weigh over 650 pounds. The average male stands three feet at the shoulder, and weighs some 500 pounds. The smallest is the Bali tiger.

**The Jaguar**, *Panthera (Jaguaris) onca*, is the New World's biggest cat. A sturdy, powerful creature, it may be six or eight feet long, and weigh up to 250 pounds. No wonder the people of Mexico and Central America call the jaguar *el tigre*, and make a hasty retreat when they glimpse its tawny, black-spotted form in some dense jungle thicket. Among the cats, only the lion and tiger are larger than the jaguar.

Although this great, dangerous beast has disappeared from many of the places it once haunted, it is still found from Patagonia all the way through South and Central America, and as far north as Texas, New Mexico, and Arizona in the United States. Commonest in the tropical lowlands, where it often dwells in the marshes, it will make its home in arid and mountainous regions as well.

At night, the jaguar's deep, throaty roar wakes the jungle and fills its inhabitants with terror. No living creature is secure from the big cat's savage assault.

Along the rivers it will tackle the alligator or the huge capybara, giant of the rodent race. It will pounce upon the turtle, turn it over, and rip it out of its shell. A strong swimmer, the jaguar often will not abandon the intended victim that seeks safety in the water. Even the monkeys in the trees sense imminent danger when they hear the cat snarl, for they know it can climb and leap from branch to branch with impressive agility. The peccaries, wild pigs of the jungle, are a special favourite of the jaguar's, and domestic stock, too, frequently falls prey to it.

There is, however, sufficient evidence to prove that the jaguar does on occasion attack man. It is the only American animal that becomes a man-eater by habit. Not every jaguar will kill people—only certain individuals are guilty. Instances of such attacks are becoming less common; the cats seem to be learning to avoid the man with the gun.

One of the handsomest of all cats, the jaguar has a coat that is rich yellow or tawny in colour, marked with a chain of black spots down the back, bordered by five rows of black rosettes, running lengthwise on the sides. Its tail, limbs, and head are heavily spotted and lined with black. The larger head, stocky and more robust in form, shorter tail, and larger rosettes serve to distinguish it from the leopard. At least a dozen subspecies are known. Black jaguars are not unusual, especially in the valley of the Amazon. There are spots present even on these, but only a good light will reveal them.

The jaguar may mate at any time of the year. About one hundred days later, two to four kittens are born. They are more heavily spotted than the adults, but lack rosettes. The male appears to be a permanent member of the family; a good husband and a providing father, he is

ready to feed and protect his young at all times. But when the kittens are a year old, they are capable of shifting for themselves, and when they reach three years they are old enough to breed. Their life span is twenty years.

**The Cheetah, Guepard, or Hunting Leopard, *Acinonyx jubatus*,** of Asia and Africa, is the fastest land animal on earth. Leaping from a position of rest, it can reach a speed of forty-five miles an hour in two seconds. But that is not even the top rate of this lightning-swift cat; timed by a stop watch, it has actually raced along at seventy miles an hour!

Although the cheetah is able to outrun a greyhound, it cannot keep up this extraordinary pace for long. Four or five hundred yards would be its limit, and then it is pretty well winded. But still it is evident that so speedy and big a cat—it is as large as the leopard—can, if trained, be a remarkable help to hunters.

Long ago the rajahs of India recognized the cheetah's remarkable abilities and put them to use. They found that the cat, if taken too young, was not aggressive enough. What was needed was a cheetah that had learned the savage ways of its kind, yet could be trained to respond to its masters' cues.

The Indian hunters learned there were certain trees to which the wild cheetahs came to whet their claws. Here the men would lie in wait for the unsuspecting animals. They snared the beasts with nooses, carried them off despite their savage resistance, and put them through a rigid course of training. The result? Cats that hunted like dogs.

The most like a dog of all the cats, the cheetah is superbly equipped for running. It has long, slender legs, so that it stands two and a half feet high at the shoulder. Its feet are narrow but large. The claws

in particular remind us of the dog's—they are stout and always unsheathed, for the cheetah cannot draw them back completely like other cats.

Its body, admirably muscled but lithe, is streamlined, so that it offers little resistance to the air as the animal makes its headlong dashes. The long tail aids it in turning.

The cheetah is becoming a rarity in Asia, although it was once found in many



### Cheetah

**With a top speed of 75 m.p.h., the cheetah is the fastest land animal.**

places, from the Caspian Sea to Sumatra. In Africa, too, it is disappearing, along with the big game, as man encroaches on its ancient domain, but you may still glimpse it in East Africa, Senegal, the Sudan, Transvaal, Bechuanaland, and Rhodesia.

This feline spends its resting hours in tall grass or lairs among the rocks. Departing from the habits of many of its kind, it is abroad during daylight hours, even in the hot season. It hunts by sight rather than smell, and bright moonlit nights will bring it out of its hideout. Usually two or three animals travel in company; occasionally parties of four or five have been seen together, but we believe these are family groups.

## The Sea Lions and Seals

Whenever we watch seals, we cannot help marvelling at the difference between the way they move in the water and the way they travel on land. In the water, they are all amazing speed and grace, scarcely raising a ripple on the surface as they streak forward. On land, they are clumsy, awkward waddlers.

This contrast is typical of all the creatures in the order Pinnipedia—the sea lions, walruses, and true seals. We call them pinnipeds, or—if you prefer a more recognizable term—finfeet. They are land-and-water animals with finned flippers; warm-blooded mammals specially adapted for life in the water. Unlike the whales and porpoises, the pinnipeds are not entirely independent of land; they spend part of their existence on the seashore or on floating ice. As for speedy travel in the water, these finfeet are hardly the equals of the whales. On the other hand, seals and walruses have greater agility in the water—they can manoeuvre with perfect safety in the pounding surf around ragged rocks.

Distant ages ago the ancestors of these animals were exclusively creatures of the land. No doubt they hunted along the

shores and beaches for food left by the receding tides.

How long do you think it took the ancestral finfeet to change from land-bound animals to seafaring mariners? A great span of time indeed, it must have been—probably more than several million years. Gradually, little by little, the ancient pinnipeds went further and further into the water. By degrees they became streamlined and fashioned for a life in the deep.

Today, the finfeet as a group are at their most abundant in northern waters; however, we find them in all seas except the warmer parts of the Indian Ocean. As we have seen, these creatures have streamlined bodies to cut down water resistance as much as possible, and their fore and hind limbs have been modified into flippers. The animals are usually covered with hair or fur to keep them warm in their Arctic home, but we notice this difference among them—the walruses and true seals are more thoroughly insulated with a heavy layer of blubber than the sea lions. Consequently, the walruses and true seals are less dependent on a warm coat of hair.

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## Eared Seals or Sea Lions

Perhaps you have been wondering about such terms as “true seals,” “eared seals,” “sea lions,” and the like. How are they similar, how do they differ? The true seals are the ones most highly specialized for life in the water. As part of this more

advanced adaptation, they do not have outside ears.

But there are other creatures that look very much like these true seals, with one noticeable difference—they have external ears, and are called eared seals. Another

name for eared seals is "sea lions." The hallmark, then, of the eared seals or sea lions is that they are less highly adapted for life in the sea. Not only do they have a small external ear; they are superior to the true seals when it comes to moving about on land. The eared seals are able to rotate their hind limbs forward to support the body as they progress on land; their front flippers are large, long, and for the most part naked.

The sea lions have short, sleek hair and tight-fitting fur which varies in colour from species to species—generally some shade of grey or brown. These animals—they make up the family Otariidae—are particularly given to living in herds; they are even more sociable than other kinds of seals. The adults are, of course, thoroughly at home in the water, but the young, born on land, must learn how to swim. It is rather strange that though there are sea lions in the North and South Pacific, the South Atlantic and other southern waters, they have never reached the North Atlantic.

Before we turn to some of the different kinds of sea lions, it will be interesting to get some notion of what seals in general eat and how they eat. They are all great fish-eaters—fish is their staple food. But, depending on the species, they add crustaceans, squids, and even shellfish to their daily rations. Each side of both jaws is lined with interlocking rows of sharp-pointed teeth—ideal weapons for seizing and holding their finny prey.

The seal has no broad-crowned molars for crushing and grinding food. Consequently the animal must swallow food whole—generally the prey is eaten while it is still alive. Many seals also bolt quantities of stones and gravel, not, as some sailors more or less jocularly suggest, for ballast, but to help mill their food. This habit reminds us of certain grain-

eating birds which need gravel to grind the hard corn in the gizzard. Of course, the quantity of stone or gravel that most birds will take is trifling compared to what the seals require. On the average, about sixteen pounds of stones—some as large as a hen's eggs—are taken from a sea lion's stomach.

Examination of the stomach contents of the seals that travel in great herds yields another interesting piece of information: herring is the mainstay of their diet. The **Leopard Seal** of the Antarctic is the only species that feeds on warm-blooded animal life. It has large, vicious-looking teeth for cutting and tearing flesh; but even this seal lacks crushing molars, and it must bolt penguins and other sea birds more or less in big chunks. Still, it cannot digest the feathers and must get rid of them through the mouth after the meat has been dissolved.

**The Northern Fur Seal, or Sea Bear,** *Callorhinus alascanus*, also known as the **Alaska Fur Seal**, has the finest fur of all the seal tribe. (The term "sea bear" is merely a popular name. The northern fur seal is an eared seal.) Of medium size, the northern fur seal is about six feet long, with a weight of five hundred to seven hundred pounds. These figures apply to grown bulls; females are much smaller.

The northern fur seal is famous for the thick, soft fur that underlies the longer, glistening guard hairs. Fur processors remove the coarse outer hairs, leaving the silky plush of the inner coat—the commercially valuable sealskin. The bull is black, with a cape of grey hair on the shoulders and a swollen neck. The female is mainly grey.

Every spring since time immemorial the northern fur seals have left their Pacific haunts to converge on the small,

## Northern Fur Seal

bleak Pribilof Islands in the North Pacific to breed. Nothing keeps them from following this inexorable routine; though the animals were slaughtered in many thousands for their fur, those that escaped always returned to the islands to mate.

Once the breeding season is over and the pups are raised, the fur seal puts out to sea again and does not go ashore until the following spring. The fur seal winters in southern waters at latitudes roughly parallel with California.

The northern fur seal is a herd animal. The bulls have large harems usually numbering forty or fifty cows—though this figure may be as large as a hundred cows. In April or May the bulls push ahead of the main herd, clamber on land, and take up their positions on the island shores. The first-comers get the best places—but they must fight to hold them. Each station covers an area of seventy-five to a hundred square feet. The choice locations are naturally those near the water's edge.

From the middle of June to mid-July, the mature females, now heavy with young, begin to arrive; they are met by the nearest bull and escorted to his station. The cows give birth to a single pup within a few hours of their arrival—or within a day or two at most. The biggest and strongest bulls get the most females; the weaker move into "idle-bull" position behind the main harems and take what opportunity offers them. The "bachelors," too young to mate, congregate in small, solitary groups.

Once a bull has established his position, he never leaves his harem until it is time to depart from the island. He trusts neither his "wives" nor his neighbours; so, from two to three months he goes without food, continually uttering threatening bellows as warnings to any bull that might challenge his proprietary rights or dally with any notions of conjugal

poaching.

By August all the pups are born, and the females have mated again. The old bulls, gaunt from their prolonged and self-imposed fasting, brawling, and guarding, abandon their truculence and assume their more normal group mode of life for another year. However, the mating season is not quite over for all the members of the colony. About this time thousands of virgin females, which begin to breed at two years of age, come ashore to mate and are excitedly met by idle-bulls that have more or less patiently bided their time.

The pups, born with wide-open blue eyes, learn to swim by the time they are six to eight weeks old. They are weaned in three or four months, about the time when the main body of the colony puts out to sea. On their winter cruise, seals travel some six thousand miles and are subject to attack by the killer whale, which may swallow as many as twenty or more seals in quick succession. The mortality rate among seals is particularly high during their first three years; nearly fifty per cent of the pups never reach



**Fur Seal**

Like all Eared Seals, this seal has well developed fore limbs.

maturity. There are many deaths from accidents on the breeding grounds, and aside from the losses inflicted by sharks and killer whales, some animals perish during severe storms.

The life span of fur seals is about twenty years, but few of them ever attain this. Still, twenty-one-year-old females have occasionally been seen with pups, and some bulls have lived to be twenty-two years old.

**The Southern Fur Seal, *Arctocephalus*** ("bear-headed"), varies in size from about five and a half feet in length and 450 pounds in weight for the **Townsend Fur Seal**, one of the rarest forms, to approximately seven feet in length and eight hundred pounds in weight for the **South African Cape Seal**.

Once widely and liberally distributed along the Pacific shores of Mexico and the coastal waters of South America, Africa, and Australia, the southern fur seal is similar in appearance to its northern cousin. The southern variety differs in skeletal structure and in its fur, which is of somewhat inferior grade. There are seven geographical species, all of them reduced to the border of extinction.

**The California Sea Lion, *Zalophus californianus***, is the trained seal of the stage and the one frequently seen in zoological gardens and circuses. A moderately large, dark-brown seal with thick, close hair and a poor grade of short under fur, it is found along the Pacific coast of North America from southern Mexico to northern California. Males measure eight feet long and weigh up to six hundred pounds.

The life history of California sea lions is much like that of the northern fur seal. Less jealous of their harems, the bulls even take time out for feeding. Though fond

of fish, the sea lion is even more partial to squids and is thus no serious menace to food fishes.

**Steller's or the Northern Sea Lion,**

*Eumetopias jubata*, an enormous brownish creature, is the largest of all sea lions. Steller, the German scientist who first discovered this animal, named it *Leo marinus* ("lion of the sea"), as he noted the greatly swollen neck of the males and the leonine eyes with their golden pupil and white iris. Full-grown males may reach a length of thirteen feet and weigh as much as fifteen hundred to two thousand pounds. The female is less than half the size of the bull.

This great sea lion has much the same habits as the fur seal, though the colonies and harems are not so large. The bull is not jealous and does not fight so desperately over his harem as a fur seal bull; in fact, there is more fidelity among the females. When a battle does ensue, the fighters pay no attention to the pups underfoot who may be mercilessly crushed to death.

The baby sea lion comes into the world with its big blue eyes open—at least they are wide open almost immediately after birth. It soon gains control of its limbs and romps among the yellow hulks of adults. In a few days it can move swiftly—as indeed it must if it is to escape being crushed by the battling bulls. Weighing between thirty-five and fifty pounds at birth, the pups will weigh about one hundred pounds two months later. The front part of the animal develops more rapidly than the rest of the body; an adult male sea lion has a large, swollen neck and enormous shoulders.

Familiar as we are with the sea lions' gracefulness in the water, it seems incredible that they have to be taught to swim. The baby sea lion does have to

## Walrus

learn to swim; we are told that the mother picks up the pup by the back of the neck and carries it to the water for its introductory swimming lesson. At first the baby struggles in the surf—but by the time it is two months old, it ploughs proudly through the breakers and rides the waves like a veteran.

With the end of summer and the close of the breeding season, the big brown animal leaves the cold, damp, icy coast of Alaska and travels south to the warmer waters of Mexico. Its summer range is the rocky coast of Alaska north to the Bering Strait.

This large sea lion was hunted extensively for its blubber; the hide and intestines were used for a number of purposes, including the manufacture of raincoats. Present laws prohibit indiscriminate killing of sea lions, but fishermen may destroy them when they interfere with fishing activities.

**The Japanese Sea Lion** is now believed to be extinct, and has been relegated to museum status. The **South American Sea Lion**, also known as *lobo del mar* (Spanish for "wolf of the sea"), is found on both sides of the South American continent; it has maintained itself better than other seals in South American waters. The male **Australian Sea Lion** differs from other sea lions in having a patch of yellow on the crown of the head and back of the neck. The little-known **Hooker's Sea Lion**, of the Auckland Islands south of New Zealand, has a flattened head and a comparatively long muzzle.

## Walruses

**The Walrus**, *Odebenus*, lives in the loneliest and most desolate kingdom in the world. Its days, spent on floating ice, are

beset with bitter cold, raging snowstorms, and fierce blizzards. Strangely enough—from our point of view—the walrus seems to enjoy this kind of existence. Few other creatures could maintain themselves amidst such drastic conditions.

Not many mammals are so grotesquely ungainly as the walrus, with its crude, wrinkled exterior, yet it has a majestic grandeur all the same. It was born on a cake of ice, covered with a blanket of late-spring snow, and rocked to sleep by stormy winds, with the sound of the grinding ice pack in its ears. Though fat and pudgy, its little pug face has an appealing beauty to the two-thousand-pound mother walrus; awkwardly but lovingly she tucks her baby's little body between her flippers with her long, gleaming tusks.

The bitter-cold winter storms are of little consequence to the walrus mother—they are all part of her life. Her eyesight is not of the best, but she has a sharp sense of smell and is ever on the alert for the prowling polar bear.

As one of these marauders approaches, she rises to her full height, and her neck bulges as she utters a deep, guttural, challenging bellow of defiance. She swings around to follow the circling bear; one step too close, and with a flash down comes the full force of her tusks. Not so easily dismayed, the bear continues his attack. Occasionally, by dint of persistent harassing, the bear will manage to rob the mother of her child; but the chances are that he will crawl away to lick his wounds, a sadder and perhaps wiser animal.

But it is really the killer whale that is the deadly foe of the walrus. Caught in the sea away from the friendly shelter of the ice, a mother walrus will wage a desperate struggle with a school of these tigers of the sea to protect her young. But as fast as she sinks her harpoonlike tusks into a

### California Sea Lions



whale, another swings into action and it becomes doubtful whether she can save her own life.

The walrus is easily recognized by its long ivory tusks. They may reach a length of thirty inches—in fact, the extra-large ones measure up to thirty-eight inches and weigh a good eleven pounds. Both male and female have tusks, but they are heavier in the bulls. An enormous creature, the walrus has a practically hairless skin which is wrinkled and roughened like the bark of an old oak tree. Large males are ten to eleven feet long and weigh between two thousand and three thousand pounds.

The walruses, which make up the family *Odobenidae*, are like the sea lions in some ways, different in other ways. Walruses have the same kind of flippers, for example—they can rotate the rear flippers in order to get about more easily on land. However, the walruses, unlike the sea lions, have no outside ears.

Though this animal is a slow, clumsy swimmer, it is big enough to protect itself from most natural enemies with the

exception of the killer whale. Feeding on the ocean bottom, it uses its tusks to dig up clams and other shellfish. It cracks the shells with its back teeth but then swallows the shells along with the meat. Crushed by action of the stomach and small stones, the meat is then digested and the empty shells are ejected through the mouth.

The walruses enjoy a family life that is more peaceful than the sea lions'. Bulls, calves, and cows mingle together, albeit in a somewhat quarrelsome manner. Discord arises chiefly from their dislike of being disturbed when sleeping. One walrus may accidentally nudge another, whereupon the offended sleeper wakes up with a mighty, trumpet-like roar and takes a prodigious slap at its nearest neighbour. The latter, in turn, utters an ear-splitting bellow and passes the blow on to the accompaniment of similar deafening sounds of protest—until the whole colony is in a turmoil.

The cow walrus has but one calf at a time, giving birth on the ice floes in May or June, nearly a year after mating.

## Harbour Seal

During its early life, the baby walrus rides on its mother's back in the water and holds fast with its flippers when she submerges for food. The young walrus is dependent on its mother for nourishment until it is two years old, when its tusks are long enough for digging clams. Until this time it must live on the mother's milk.

The walrus is generally restricted to the ice floes and rocky coast of the Arctic Ocean, although it has been recorded as far south as Newfoundland and northern

Scotland. There are two named forms of walrus: the **Atlantic Walrus** and the **Pacific Walrus**. At one time walrus were hunted extensively for their blubber; but nowadays there are so few left that such ventures are no longer worth while commercially. The Eskimos use the hide, which is from half an inch to three inches thick, to make their shelters and cover their boats. The meat and fat serve for food, and the ivory tusks are made into tools and carved ornaments. And so it is that Eskimos can exist in the Arctic.

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## The True Seals

The true seals are strongly adapted for a water-dwelling existence. To begin with, they lack an external ear. The hind limbs are modified into flippers for swimming, but they extend straight out behind; the seal cannot rotate them forward for greater support on land. As for the forelimbs, they have developed into short paddles used mainly for balancing and turning in the water. The entire animal, including the limbs, flippers, and the short tail, is covered with short, coarse hair, without any trace of underfur. The true seals (they make up the family Phocidae) are sometimes called "hair seals."

Seals must leave the water to breed, and to bear their young, which remain on land for several weeks before being taught to swim. The true seals have spread to all the oceans of the world; yet, despite the fact that they are primarily ocean-dwellers, they have ascended many large rivers and even entered inland lakes. Swimming on the surface and breathing normally, the animals have an average heartbeat rate of one hundred per minute; when they dive the heart action slows

down to ten beats per minute.

Seal meat and blubber are the Eskimo's chief sources of food during the cold winter months, and he uses the seal skin to make clothing. It is in the northern regions that seals are found in the greatest abundance. Commercial sealers now plunder the great herds of seal in the North Atlantic and annually slaughter many thousands for leather and oil.

**The Harbour Seal**, *Phoca vitulina*, is the common seal of the temperate and colder regions of the Northern Hemisphere. This small species is frequently seen along the reefs, coastal islands, and in sheltered harbours. Never straying far from land, it ascends large rivers, often beyond the influence of the tide, and occasionally makes its appearance in inland lakes. A harbour seal is capable of travelling at twelve or fifteen miles an hour—but it cannot keep up this speed for more than half a mile.

The colour pattern varies quite a lot. The normal shade is yellowish grey spotted with dark brown, but the fur may integrate to black spotted with white. The

full-grown male easily measures five feet long and weighs one hundred pounds or more. The first coat of the harbour seal is white and woolly, but this is shed immediately after—or even before—birth in the spring. The newborn pup, which is nursed for four or five weeks, has a cry that reminds us of a lamb bleating.

While the harbour seal does not congregate in large colonies, it is nevertheless fond of company. Family groups of two or three females with their young and a male or two are not uncommon. Apparently unable to sleep in the water, this seal comes ashore regularly to rest and sun itself on the rocks.

Having experienced man's assaults through many generations, the harbour seal is understandably shy and elusive. Yet it soon responds to kind treatment and protection, making a surprisingly affectionate pet for those living at the water's edge.

The harbour seal has a varied diet, feeding on cod, flounder, herring, pollack, and other fish as well as squid and octopus.

Experts now recognize six forms of harbour seal. The local subspecies dwell on the European and American sides of the Atlantic from Labrador to Maine and occasionally as far south as North Carolina, and in Asiatic and American coastal waters of the Pacific as far south as Baja California.

**The Ringed Seal, *Phoca hispida***, ranges north probably farther than any other mammal; it is the common seal of the polar region, and we rarely find it south of the Arctic Ocean. Though similar in size and colour to the harbour seal, it is quite a different animal. The ringed seal's markings are a number of rings, or white spots with dark centers. In the Hudson Bay area it is most common along the east coast, where the Eskimos call it *netcheck*.

The ringed seal is able to submerge for about seven to nine minutes; in case of need, it can stay under water for twenty minutes without coming up for air. The seal needs about forty-five seconds to change the air in its lungs between normal submersions.

This seal is not a migrator; in northern waters, when the shore ice creeps out to sea, the animal keeps a breathing hole open, visiting it periodically to rest and breathe. This habit sometimes means death for the seal—it is here that the Eskimo lies in wait to harpoon it when it makes its routine visit.

Before the spring thaw in March or April, either single or twin pups are born. The nursery is a burrow in the hard snow and has a tunnel connecting it with the breathing-hole in the ice. The newborn ringed seal is covered with soft, white, woolly fur, although even yearlings may still be whitish along the back.

**The Harp Seal, Saddle-backed or Greenland Seal, *Phoca groenlandica***, is bigger than the harbour seal. Large bulls measure up to six feet in length and weigh between six hundred and eight hundred pounds. Despite persistent commercial hunting, the harp seal still occurs in large herds in the North Atlantic. It migrates with the seasons and in winter follows the floes of the open ice as far south as Newfoundland.

Thousands of young, each weighing about nine pounds, are born in March off the Grand Banks of Newfoundland; there is usually one in a litter, and twins are rare. Coarse, pale-grey hair replaces the white, woolly birthday coat in about four weeks, when the pups are ready to enter the water. Sealers call the baby seals "white-coats."

If we stop to think about it, we realize that this colour change has protective

## Grey Seal

value. The newborn and those not yet able to swim are white, inconspicuous against the snow-covered ice packs on which they lie; the grey fur of the young that have taken to the water is far less noticeable than white would be in the sea. Incidentally, the harps or saddle stripes of the male (described later) are not completed until the fourth year.

During the early stages of infancy the young are left on the drifting ice while the parents go forth daily to fish. Since there may be several thousand offspring in a group, it is remarkable indeed that each mother should find her own pup at the close of day. Soon after the end of April the young "harps" have learned to swim and are catching fish for themselves. The herd now moves north and eventually reaches the coast of Greenland.

The harp seal feeds on whitefish, cod, and in part on crustaceans. Descending to a depth of two hundred feet, it may stay under water twenty minutes at a time. This fast seal can cruise along at a maximum of twenty miles an hour, but its average speed is much less. In the autumn migrations the great herds at one time numbered as many as five hundred thousand head. More than one hundred thousand harp seals are still taken every year in the Arctic. Oil and leather are the chief products.

The male harp seal is light grey or yellowish white in colour, with characteristic bands of brown extending from the neck over the shoulders and down each side in the form of a saddle, or harp. The female differs from the male in size and colouring; she is smaller, and the dull-white or straw-coloured fur has indistinct back markings or lacks them completely.

**The Grey Seal, *Halichoerus grypus*,** is a relatively rare member of the northern seals.



## Immature Grey Seal

One of the more common northern sea

Late in August or September the grey seal bulls crawl out on the rocky beach where their ancestors have appeared for centuries. Here they sprawl in the sun and shine. A week or so later the females drift ashore, and are greeted by the males. There is, as we might expect, considerable bellowing and competition between the males for possession of the females. Often fierce battles take place. Rolling from side to side, the bulls show their white teeth to competitors, and frequently inflict deep gashes in the necks of their adversaries.

Within a few hours after landing, the females give birth to a single calf clothed in long white fur. At birth a calf will weigh about thirty pounds. Two weeks later, its weight has increased to eighty-four pounds. The cows mate ten or twelve days after the calves are born.

Each bull has its own domain, which covers about one-tenth of an acre. When the males fight furiously for their territorial rights, they do not dominate the females. In fact, females are granted equal rights with the males and are not harassed together by a jealous bull, as in the case of the sea lions. If a cow lands on a bull's domain and stays there, she is his—but she chooses to cross over into another

field, he raises no objection and shows no further interest in her.

By November, peace reigns once more. The fighting and bellowing have ceased. The males live together in perfect harmony. A passing female does not attract even an uninterested glance.

Grey seals, especially the pups, are almost human in appearance. Their big, round eyes seem to stare out of a comely round face with a most appealing expression. During its early days the pup gets full-time attention from the mother seal. She nurses it on milk, rich and yellow with butter fat, for two or three weeks. During this time the devoted mother stays home without food in order to guard and fondle her baby and even to scratch its back. With a little tummy full of rich milk, the pup may yawn, put the tip of a flipper in its mouth, murmuring contentedly like a child, and fall fast asleep.

It is curious that at first the calves can use their hind feet to propel themselves along and flip them alternately like regular land mammals. Two or three days later they have lost this trait and never use the hind limbs again for progress on land. Many scientists hold that baby seals must be taught to swim. This is not exactly true. Young grey seals are born with a thick, woolly, white coat. They can swim from the very first, but the heavy swaddling clothes of the newborn infants are too absorbent to permit them to remain afloat long in the water.

The baby seals change their warm white clothes for the regular adult grey coats between the second and fourth week. They are weaned during the third week, when the cows are ready to go to sea, and they must feed themselves. For the next two weeks they live on their accumulated fat, but soon hunger drives them to sea, where they quickly learn to find

food and swim in the shallow water.

Within a few days the young seals are out in the deep, fishing like veterans. They soon learn to catch molluscs and crustaceans; when grown, they will also feed on rock fish and even six-foot conger eels. In this respect they are beneficial to commercial fisheries, as they destroy predatory fish.

The grey seal is limited to a narrow belt across the North Atlantic. It does not range as far as the ice fields of the north, nor, on the other hand, does it continue south into the milder temperate regions. Instead, it haunts the rock-bound coasts and outlying islands on both sides of the Atlantic at latitudes of southern Canada and Great Britain, where the sea is deep and the rough, troubled waters are rarely still.

Grey is, of course, the dominant colour of this species, but individuals may vary from almost black to pale tints, often blotched with irregular splashes of darker tones. The grey seal is about the size of a harp seal; large males measure a good eight feet and weigh about six hundred pounds.

Though the grey seal may make extended cruises at sea, it generally remains in the neighbourhood of the ancestral breeding grounds; in fact, a few members of the colony stay close by those rocky places the year round.

**The Bearded Seal, *Erignathus barbatus*,** gets its name from the festoons of coarse, flattened bristles that hang from each side of its mouth. (Sealers have another name for this species—they call it the "square flipper," after the characteristic shape of the limbs.) The animal is one of the largest of the northern varieties: the male bearded seal is ten or twelve feet long and weighs about eight hundred pounds. Now and then we come across a

## Leopard Seal



## Elephant Seal

**Strangest of all the True Seals, this species possesses an inflatable trunk.**

giant that may reach fifteen hundred pounds. Females are about seven feet in length and weigh much less than the males.

Dwelling on the shore ice in the North Atlantic and Arctic regions, the bearded seal is more or less solitary, often living alone or in small family groups. The pelt is of little value in the fur trade but is esteemed by the Eskimos for the extra-thick hide, which they cut up for harpoon lines and other heavy-duty gear.

**The Leopard Seal, *Hydrurga leptonyx*,** is among the best known of the Antarctic seals. A ferocious creature, it preys on other seals as well as fish. Many seals have teeth that are mere pegs for catching and holding fish—not so the leopard seal, which is equipped with large molars well adapted for rending and tearing the flesh of the animal devoured by this carnivorous finfoot.

The leopard seal is large—males reach a length of ten to twelve feet, females

about seven feet. The coarse coat of yellowish-grey hair is dappled with numerous black spots and sometimes with light blotches on the back.

**The Elephant Seal, *Mirounga*,** is not only the largest of the seals but also the ugliest and clumsiest. Its name is derived from its enormous size—also from the peculiar, apparently useless, elongated snout of cavernous tissue. In the relaxed state this appendage hangs eight or nine inches below the mouth. When a bull utters its deep, ventriloquial roar, this snout swells up with air and the tip curls into the seal's mouth.

Large males reach a length of eighteen or twenty feet, weighing a fantastic five thousand pounds or more. The females are about ten feet long. When one of these ponderous and grotesque leviathans is on shore, its huge body settles into an almost formless heap, its coarse skin wrinkled, furrowed, and cracked. When



### Hooded Seal

Only the males have the hood on the head, which swells in the mating season.

the time comes to shed the bleached brown coat, the cuticle peels off in large blisters along with the hair, looking as if it had been severely burned by the sun.

The elephant seal has very simple tastes—it lives to sleep and eat. Let a rude jolt break its slumber and its mighty front flipper drives a stinging shower of sand and small stones—very accurately, by the way—at the cause of the disturbance. This done, the seal promptly goes back to sleep.

In the water the elephant seal moves gracefully and rhythmically, and is capable of cruising along at a fair speed. It descends to considerable depths to feed, consuming slow-moving fishes—ratfish, dogfish, and the like—as well as small sharks and squids. The sea elephant's stomach, like that of other seals, contains a quantity of stones and pebbles that mill the food for digestion.

The breeding pattern is much the same as among the other seals. The males come

ashore about the middle of August, and some time later they select their harems from among the newly arriving females. There follows the characteristic brawling and commotion for the rest of the breeding season. Some time between February and June the female gives birth to one black pup on the beach, some distance away from the main herd.

The elephant seal has been killed for its fat and oil for many generations. Formerly the herds numbered in the thousands; today they have become so scarce that commercial hunting is no longer profitable.

The **Northern Sea Elephant**, reduced to a few individuals on Guadalupe Island off Baja California, was saved from extinction by the Mexican government in 1911. A garrison was posted on the island with orders to shoot poachers and other molesters of the herds. Formerly found on islands of the South Atlantic, South Pacific, Indian, and Antarctic Oceans,

## Southern Elephant Seal

this seal has few if any survivors.

The **Southern Elephant Seal** is responding to protection on Campbell Island, three hundred miles south of New Zealand; but, like its northern cousin, this species has become all but extinct.

**The Ribbon Seal**, a rare variety that dwells along the coasts of Alaska, the Aleutian Islands, and the Kurile Islands, is the most ornately marked of the seal tribe. It is highly prized by the Eskimos. The **Crab-eating Seal** of the Antarctic ice packs is a much larger animal with an interesting peculiarity—it has lobes in its teeth. Water passes out of the lobes when the jaws are closed, but crustaceans cannot pass through these strainers; thus the victims are held back and swallowed. The **Ross Seal**, another Antarctic denizen, is small and seldom encountered.

Much more common is **Weddell's Seal**, which lives in the same region.

**The Monk Seal** favours warm climates—we find it in the Mediterranean, the Caribbean, and in the Pacific, in the neighbourhood of the Hawaiian Islands and Midway Island. **The Hooded Seal**, on the other hand, prefers pretty much the same surroundings as the harp seal—the ice floes of the North Atlantic and Arctic waters. The “hood” is an inflatable bag of muscular tissue extending from the muzzle over the top of the head. Only the males have this feature. When they are excited, especially during the mating season, the bladder swells up, giving them a most sinister appearance. The males fight savagely during the mating season, and the roars of the spring battle can be heard at a great distance.

## Sea Cows

If you have ever seen these massive, grotesque creatures, you can relish how fantastically inappropriate it would be to call them “sirens.” Yet sirens they used to be called—even the scientists gravely endorsed the use of this incongruous name by placing these unromantic animals in the order Sirenia.

How did this come about? Centuries ago, when the animal kingdom was by no means so thoroughly explored as it is today, sailors returning from the Red Sea and Indian Ocean brought back tales of flying fishes, of gold, pearls, precious stones—and strange creatures.

What kind of strange creatures? Well, they were supposed to be half fish and half human, and they were glimpsed

frolicking about close to land. To the sailors, at first they suggested mermaids. It was a faintly plausible illusion to at least this extent, that a female dugong carries her baby in her arms and nurses it at her breast in much the same way that a human mother does.

The Japanese capitalized on the tradition. There was a “factory” in Japan which prepared so-called stuffed “mermaids” that were sold as the real thing. The famous Fejee Mermaid, which Barnum exhibited at his Museum in 1842, very likely originated in Japan. Thousands flocked to see this hoax, the great showman's gate receipts swelled mightily.

The sirenians, timid animals with a

vegetarian diet, are adapted for life in the water. They never leave it—not even to breed. On land they would be completely helpless, unable to propel themselves or to secure food. Scientists conjecture that the Sirenians—like the whales in similar straits—might even collapse their lungs by the sheer weight of their bodies.

Sirenians occupy the shallower waters between the deep sea and dry land, frequenting sheltered harbours, bays, lagoons, and estuaries; some even ascend large rivers. In the shallow water they are safe from attack by such raiders of the high seas as the killer whale and shark. We find sirenians in both the New World and the Old; they favour the warmer regions, though in past ages they were not unknown in the Bering Sea.

The sirenians are massive. But they are also spindle shaped, tapering in front to a round head with small eyes and a blunt, sometimes jowly muzzle. The body is

rounded in outline and narrows down toward the tail, which in turn flares out horizontally to form a broad, flat paddle. Sirenians have a greyish-coloured skin; some are sparsely bristled all over, others only on the muzzle. We find no trace of hind limbs in present-day sirenians, but they do have paddle-like forelimbs. These animals need to be able to submerge quickly, and their exceptionally dense and heavy bones make this fairly easy.

Sirenians feed on seaweed and other plants which they find in salt and brackish water. As such fodder is none too plentiful, the animals are never very common anywhere. Grazing like cattle, they have no occasion for speed in getting a living. There are two kinds of sirenians in existence, the Dugong (family Dugongidae) and the Manatee (family Trichechidae). The Sea Cow (family Hydrodamalidae) has been extinct for almost two centuries.

## Dugongs and Manatees

**The Dugong, or Halicore,** *Dugong dugon*. The Australian aborigines have an accomplished technique for hunting the dugong. They use a harpoon fitted with a detachable wooden handle, fastened to a line. When the harpoon strikes the dugong, it is anchored by the barbed tip and the shaft floats free except for the attached line. By following the floating shaft, the hunters can trail the dugong until it is tired out—this takes about half an hour. Then the hunters draw their canoe alongside the exhausted quarry and close its nostrils with wooden plugs. Apparently unable to breathe through the mouth, the dugong suffocates.

The dugong is by no means limited to Australian waters. We find it in the warm coastal waters of the East, in the shallow bays and estuaries from the Red Sea to the

Indian Ocean, east to the Solomon and Marshall Islands and south to northern Australia.

A full-grown male may reach a length of nine feet; the female is smaller. The dugong's body is covered with blubber and a thick hide—together, they are about an inch in thickness; the hide is hairless except around the mouth. (It is believed, by the way, that the Israelites covered the ark of the Covenant with skins of the dugong.) The animal's looks are not improved by the downward bend of the jaw that accommodates a pair of incisor teeth developed over the ages into sharp-edged tusks. These continue to grow throughout the life of the dugong. The tail has two lobes, and is rather like a whale's.

While these creatures are not given to

## Manatee

living in groups, several may graze in one place on their favoured foods—green seaweed and other water plants. When feeding, the dugong comes up for air every five or ten minutes; the nostrils are opened to take in fresh air but are closed like valves when the animal submerges. Dugongs have poor eyesight, but their hearing is good, despite their lack of an outside ear. The female gives birth to one young at a time, twelve months after mating. She carries the baby about in her flippers.

**The Northern or Steller's Sea Cow,** *Hydrodamalis stelleri*, is extinct. It took man until 1741 to discover the sea cow, but from then he needed only twenty-seven years to destroy the entire race. It was Vitus Bering and George Wilhelm Steller, the naturalist that sailed with him, who first found the sea cow on their arrival at Bering Island.

Where Steller's sea cow came from and how it reached its shallow offshore home are among the unfathomed mysteries of bygone ages. The animal was virtually a prisoner, for any attempt to leave the protection of the islands where it dwelled meant certain death; fierce killer whales patrolled the neighbouring waters. The chances are that there were less than fifteen hundred animals in the isolated colony where they were discovered, and that they would have become extinct in the course of time even without man's efficient assistance.

The sea cow, one of the strangest-looking animals of modern times, reached a length of twenty-five or thirty feet and weighed over four tons. It was covered with a rough, coarse hide cracked and wrinkled like the bark of a gnarled old oak tree. It had no teeth; instead, two pairs of grooved, horny plates ground the seaweed on which it fed. Lacking any

trace whatever of hind limbs, the sea cow had curiously clublike forelimbs doubled under in the form of a hook. These were used not for swimming but to haul the huge body along in shallow water.

Steller tells us that the sea cows lived cattle-wise in herds offshore. In resting or sleeping, sea cows would roll over on their back in quiet waters and allow themselves to drift like logs. Occupied with little else but the search for food, they tore seaweed from rocks and ate incessantly.

**The Manatee,** *Trichechus*, is a large, robust, water-dwelling mammal. It averages about seven feet in length and some 450 pounds in weight. Exceptional manatees may measure twelve feet, with an estimated weight of two thousand pounds.

The people of tropical America have been eating the flesh of the manatee for centuries. It is rich red meat, and is quite palatable. The oil or fat is sweet, and is used by the natives for cooking. At first taken for a fish, the manatee could be eaten on meatless fast days. Later on, religion caught up with science and the manatee disappeared from Friday and Lenten menus.

As for the eating habits of the manatee itself, it is a strict vegetarian, consuming anywhere from sixty to a hundred pounds of seaweed in a single day. Usually it has six teeth on each side of the upper and lower jaws. As worn-out teeth fall out in front, the whole line pushes forward and a new tooth comes in place at the rear.

The manatee has valvelike nostrils; the eyes are small and sunken. Its head is blunt, with thick, pendulous lips. An interesting feature of the upper lip is that it is split lengthwise in two lobes that move independently as the animal feeds. Stubby hairs are scattered over the body, while on the muzzle we find larger stiff

## Manatee

bristles. The forelimbs are modified into broad flippers with rudimentary nails, while the tail is broad, flat, and rounded like a huge paddle.

Fifteen minutes is usually the maximum that a manatee will stay submerged. However, in an emergency an adult can stay down for nearly half an hour. When resting, the manatee floats in the water with its back humped up, the head and tail dangling. In shallow water it curls its tail under, with the upper side resting on the bottom. Breathing normally, the animal has a heart rate of fifty beats a minute, and thirty when diving.

The manatees are sociable and peaceful in their ways of life; we find very little quarreling among them. Life, however, is not always tranquil for the manatees in the wild state. There is a constant threat of death in the crocodile-infested waters, while lurking sharks prevent the manatees from escaping to deep waters. If they managed to reach greater depths, they would meet added peril from killer whales. The basic condition of the manatee's existence is that it is not equipped for defence.

We divide the manatees into four species: the **African Manatee**, found

along the west coast from Senegal to the Cuanza River in Angola; the **West Indies Manatee**, of the Caribbean; the **Florida Manatee**, dwelling in the coastal waters of eastern North America from North Carolina to Florida and Central America; and **Natrerer's Manatee**, living in the rivers of north-eastern South America. In the northern part of the manatee's range there is some seasonal migration.

The young, generally one or two, come into the world in April or May and weigh about sixty pounds. Born under water, they are immediately raised to the surface by the mother. Like all mammals, the manatee is a warm-blooded, air-breathing creature that would suffocate if it could not get air. Every three or four minutes, night and day, mother and baby must come to the surface to breathe. The mammary glands are located on the chest, and the pup is clasped in the mother's flippers as it nurses with its head above water.

A youngster remains with the parents until it is half grown. Once the offspring are able to get about by themselves, the manatees gather in groups of fifteen or twenty. They are surprisingly active as they sport and play.

### Manatee

This creature may well have been the origin of the mermaid legend. The two shown here are having their daily scrub at the London Zoo.



# Elephants

More than any other living creature, the elephant challenges and fires our imaginations. A unique combination of huge size, strange appearance, tremendous power, unexpected gracefulness and smoothly rhythmical action, it is perpetually on the move.

Seeing a herd of these gigantic pachyderms in their native haunts at close range seems to take us back to some faraway geological time, into an eerie and mysterious age when such mighty mammals were the greatest power on the earth.

The Asiatic and two African species of today are all that remain of a once great elephant population that roamed over most of the Northern Hemisphere. Not more than fifteen thousand years ago—only yesterday in geological time—woolly mammoths were plentiful on the grassy tundra of the polar region of the North. They had gigantic curling tusks and a winter coat of thick hair that almost reached the ground. Some of them, like the Columbia and Imperial mammoths of North America and the straight-tusked varieties of Italy, stood thirteen feet and over at the shoulder. On Cyprus and other Mediterranean islands, on the other hand, there were dwarf elephants no bigger than a pony. Mastodons were common in Europe, Asia, and North America.

Elephants are the largest and most powerful land animals alive in the world today. These monsters of the tropical jungles and grassy plains of Asia and Africa are mighty enough to command impunity from attack by any other living wild creature.

The elephant is covered with a thick

grey hide, leathery and tough in texture. Though this hide is a good inch thick, an elephant is very sensitive to cold. Even a slight frost will give it a severe case of cramps.

Like the typical mammal, the elephant possesses hair, though this statement is rather academic—the short, stiff, sparsely distributed bristles can be better felt than seen. As for the elephant's superbly thick and bushy eyelashes, they are over five inches long, a detail most of us are apt to overlook. The long, ropelike tail has a wiry tuft at the tip. Indian craftsmen wrap the tail hairs with narrow bands of gold and fashion them into bracelets and rings.

The head is massive, the eyes small, the ears large and fanlike. The heavily muscled neck is short, which rather limits the elephant's ability to turn its head. The brain is small in proportion to the size of the body.

The elephant's teeth include the notable second pair of upper incisors that develop into picturesque ivory tusks and continue to grow throughout the life of the animal. We find these tusks foreshadowed in the ancestor of all the elephants—an animal that lived in North Africa during the late Eocene period, in the neighbourhood of forty-five million years ago. In this prehistoric creature the rudimentary upper tusks were quite prominent and directed sharply downward, while the tusks in the lower jaw extended nearly straight ahead and were directed slightly upward.

In the elephant of today, the molar teeth (the only kind it has, aside from the tusks) are huge blocks, coming into place one at a time on each side of the upper

## Elephant

and lower jaws. At no time does an elephant have more than twelve teeth in use. As a tooth wears out, it is gradually pushed forward and falls out, and another moves in from the back to take its place. In its lifetime the animal has twenty-four molars in all; in addition to four milk teeth.

Much of the sense of wonderment we feel when we see an elephant is due to its amazing trunk. This "proboscis," as the scientists call it, impresses not only little children but savants as well. (We can gather as much from the scientific name of the elephant order, which is Proboscidea.) The long, flexible, and muscular trunk is really the elephant's lengthened nose and upper lip. (The name "trunk," by the way, appears to be based on a misunderstanding, the word having been confused with the French *trompe*, which means "trumpet" or "proboscis." But, whether the term was originally right or wrong, we all know what is meant by the elephant's trunk.)

Thick and well protected on the outside, the elephant's trunk is delicate and sensitive inside; the animal is careful to guard it from heavy, smashing blows. The margin of the free end is formed into a lobe or lobes used as "fingers" to pick up small objects. In feeding, the trunk serves as an arm and hand for grasping the food, which is then brought to the mouth to be chewed and swallowed.

The elephant does not, as many suppose, drink through the trunk. Instead, it sucks up water and squirts it into the mouth. The proboscis also serves as a spray gun when the animal bathes itself in either water or dust—both of which it habitually enjoys.

The elephant has poor eyesight and its hearing is only fair; hence its sense of smell is very important. It is probably the most acute sense of smell in the animal

kingdom, and it is located in the trunk. Watch the great creature, and you will observe that the trunk is constantly in motion, twisting and uncurling to catch the slightest taint of human or other contamination in the breeze.

Its wonderful trunk serves the elephant in many other ways. Not only is it used to test the wind—the animal examines suspicious objects and dangerous ground with it as well. The appendage is employed in lifting, and can hoist a weight of almost a ton; it has, on occasion, hurled a man a good forty yards.

The elephant even uses its trunk to express affection. During courtship, a cow elephant and a bull elephant caress each other with their trunks, and the cow is ever fondling her calf with her trunk.

In this multi-purpose organ, it has been said, there are 40,000-odd muscles. But whether there are more or fewer need concern us little—the trunk is a superb tool for elephant endeavours, and helps to make its possessor one of the wonders of the animal world.

The elephant is a herd animal. A big bull is the nominal leader, but in the field a wise old cow usually takes the lead. When on the march, the band travels in single file. Going down steep slopes, elephants slide on their bellies, with the back legs stretched out behind and the front legs extended forward.

As among all herd animals, the mature males are fierce rivals for supremacy. An old leader beaten in battle is not tolerated by his conqueror and is driven away. His wounded pride makes him irritable and bad-tempered. Such a solitary male usually turns "rogue"—a sulky, dangerous individual, looking for trouble and tearing trees out of the ground just to work off his tantrum.

There is no fixed mating season among elephants. From time to time the males

## Bush Elephant

carry on in an irresponsible and frenzied manner. This behaviour, which apparently coincides with breeding intervals, is known as "must" or "musth." At such times the animals are cross-grained, moody, and generally unreliable.

Twenty-one months or so after mating time, a single calf is born covered with coarse black hair. It stands about three feet at the shoulder and weighs approximately two hundred pounds. The calf sheds its milk tusks five or six months after birth, but it continues to suckle for another two years and remains under its

mother's care for two years longer.

An elephant is ready to mate at eleven or twelve years; it reaches maturity at fourteen, or thereabouts, though it continues to increase in size and weight for some time after. What we might call the wisdom tooth, the last tooth to make its appearance, is pushed into place when the animal is some forty years old. The life expectancy of elephants is somewhat less than is popularly supposed; the usual range probably is not more than fifty to sixty years. The maximum recorded life span of eighty-four lacks confirmation.

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## African Elephants

**The Bush Elephant**, *Loxodonta africana*, is the largest of present-day elephants. It reaches a maximum shoulder height of thirteen feet and weighs over six tons. However, bulls rarely exceed eleven feet, and cows are about seven feet at the shoulder. You can distinguish the bush elephant of Africa from the Asiatic species by the more blackish skin colour, the larger ears, and more rounded, sloping forehead. Another difference is that in the African type the back is highest at the shoulder; the Asiatic elephant's back is slightly hollowed out at the shoulder. These two forms are all that is left of the family Elephantidae today.

The favourite fastness of the African elephant is the dense, shadeless bush, little taller than itself, but it also haunts the mountain forests, the giant grass veld, the bamboo forests and the reed swamps. Despite its enormous size and ponderous build, an African elephant can move through the bush as silently as almost any other animal.

On one occasion, when stalking an enormous bull, the author and his party suddenly saw its great form, covered with red dust, wavering above him, less than

twenty-five yards away. Its trunk was extended straight out, waving gently to catch his scent. As he stood spell-bound at the apparition, it vanished in the thick bush so silently and quickly that he almost doubted what he had actually seen.

Backtracking the animal's trail, the writer found tracks that showed the elephant had circled to see who the intruders were and had stood within ten feet of them, watching them go by. From its point of vantage it could have killed the whole party with little effort, if it had so desired.

The enormous ears of the African elephant serve as fans, and are kept constantly in motion during the heat of the day to circulate the air. Each ear is about three and a half feet wide—over four feet wide and five feet long in large bulls. In these, the spread across the extended ears, including the head, is fully ten feet.

The trunk, which may measure up to ninety-eight inches for a large bull, has two finger-like extensions at the tip. There are three toes on the hind feet and five on the forefeet, but all we can see of the toes are the broad nails. The tail may

be as much as fifty-seven inches long, with a fifteen-inch tuft of bristles at the tip.

Both bulls and cows have tusks. In the female they are usually smaller and more slender, but some cow-elephant tusks have reached almost six feet in length. Records for African tusks vary considerably and average between ten feet and nearly eleven and a half feet in length and 220 and 290 pounds in weight.

From about the time an African elephant reaches maturity until the moment it dies, it never lies down. Amazing as it may seem, the African elephant generally sleeps standing up for the last thirty or forty years of its life! It appears to be able to enjoy enough repose while in a standing position. The fact that its legs are built like supporting columns may explain why this stance is restful for the beast.

Young elephants, and occasionally some full-grown ones, sleep stretched out on their side. With a calf elephant it is an easy matter to lie down; but as it grows older and heavier, the task of lowering its huge bulk to the ground and raising it again when the elephant gets up, becomes increasingly difficult. In going down, the animal bends the front legs forward at the elbows and the hind legs backward at the knees. The elephant then rolls over on its side and stretches out. (The elephant's height, by the way, is approximately twice the circumference of the forefoot; often this measurement turns out to be remarkably accurate.)

Ordinarily an elephant walks at a fast shuffle; a rate of six to eight miles an hour is common. When enraged, this ponderous beast can charge for fifty yards at a speed of twenty-five miles an hour. Normally it cannot jump even a narrow ditch—its huge body must have support fore and aft at all times. However, a charging bull has been known to clear a wide ditch, though it was lame for some

time afterwards.

Elephants know—and follow—the best routes through the forests and mountains. Many of the highways in Africa today proceed along the routes originally laid out by elephants. They can climb steep embankments and slide down them or walk along a narrow ledge three feet wide. In some instances, they grasp roots or branches to lever themselves up and over rocks.

African elephants are fond of bathing, but they are fastidious about the kind of water they drink. In Kenya the author found that they came a long way to dig holes in the sand of a dry river bed to get clean water after passing by a fast-flowing river with chocolate-coloured water. The water pit is not dug with the tusks; about two feet deep, it is sunk by scraping with the forefeet and sending the sand and gravel flying.

The African elephant is generally conceded to be less tractable than its Indian cousin, though just as intelligent. Despite its more independent character, the African variety can be domesticated and trained for clearing land and other labourious farm work. The bush elephant was once common over most of the continent and frequented all types of country from plains and jungles to mountains of ten-thousand-foot elevation. It is still holding its own in some parts of equatorial Africa, where three subspecies are known to exist.

**The Forest Elephant**, *Loxodonta cyclotis*, makes its home in the rain forests of West Africa from Sierra Leone to Angola and east to the basin of the Congo River. On a comparative basis we can call it "little," as it rarely exceeds eight feet at the shoulder. Its ears, too, are relatively small and rounded for an African species. As for the hind feet, they usually have four

## Asiatic Elephant

toes instead of three. Immature forest elephants have been mistaken for pygmy elephants, but, given time, they always grow up unless artificially stunted.

## Asiatic Elephants

**The Asiatic or Indian Elephant**, *Elephas maximus*, dwells in India, Ceylon, Burma, Indo-China, and the Malay Peninsula. After the cow the elephant is the second most venerated beast of the Hindus; the Hindu god Ganesh had the head of an elephant. The Buddhists class the elephant with the dove of peace. One of their legends tells of an elephant in "musth" that was sent to kill the Lord Buddha. They met, but when Buddha touched the beast on the forehead, it bowed low before him.

The Asiatic elephant, unlike its African cousin, lies down to rest. When it is ready to go to sleep, it stands motionless in the forest like a statue. After about an hour, when the world is fast asleep, the elephant goes down so suddenly and quietly that in a flash of the eyelids its dark shadow seems to vanish in the air. It usually sleeps in two "shifts"—one from about ten in the morning to three in the afternoon, and the other from eleven at night to three in the morning.

Elephants do not readily breed in captivity, though captive animals will breed normally in natural surroundings.

Normally a male and female elephant go through several days and even weeks of courtship. Then, for a month more the pair will graze and live together. Once the honeymoon is over, a female seeks the close friendship of another female and they remain inseparable until some time after the calf is born. It takes the watchful care of both to protect the calf from tigers. Most females first mate between the ages of eighteen and twenty-one.

In the natural state, most elephant calves are born in the spring, between March and April. The coming into the world of a baby elephant is quite an event in a herd of wild elephants. Calves are usually born during the night. There is a constant bellowing and trumpeting among the elders to herald the occasion. This terrifying din doubtless serves the purpose of scaring away marauders—especially tigers. For the first few weeks after the arrival of a calf, a herd will stay put in one locality and more or less keep a closed circle around the mother and her calf, particularly at night.

During the early days of the baby's life the mother, if disturbed, will pick up her calf with her trunk and carry it away to safety.

A baby elephant follows at its mother's heels for at least three or four years and is suckled at the breasts between her forelegs.

Up to the age of five, the elephant's trunk is of little use to it; but at this time the youngster begins to gather fodder and gradually ceases to depend on its mother's milk. Females average four or five calves during a lifetime. Twins are occasionally born, and it is not uncommon for two calves of different ages to be following one mother. Occasionally a female will have as many as eight calves in a lifetime; one female reportedly gave birth to a calf on her sixty-first birthday.

At sixteen, young elephants have reached the adolescent stage and males begin flirting with females; but the bulls exhibit no sign of "musth" until they are over twenty-one. "Musth" is shown by a discharge of a strong-smelling waxy substance or fluid from glands near the <sup>sub</sup>nostrils, just above the mouth. <sup>eyes.</sup> It normally occurs during hot weather and may last two weeks. From the age of thirty-five to forty-five the discharge is greatest and

## Asiatic Elephant

marks the period in which an elephant is in its prime; "musth" is usually connected with sexual excitement.

During "musth" the bull goes on a rampage and cannot be trusted. Often the fluid drips down on to his mouth, which makes him even more ferocious. At the age of fifty, the discharge of fluid from the "musth" glands has subsided and finally disappears.

Animals in "musth" are not to be confused with rogue elephants that plunder and destroy. It is the social outcast that in some way has broken the laws of the herd and been expelled that becomes a savage, brooding rogue. Rogues that have been wounded and caused to suffer by man may also become a menace to all and everything they encounter. In ancient days a rogue elephant filled the office of public executioner in India. Occasionally there are female rogues.

Though Asiatic elephants are smaller than the African variety, they are anything but small.

The Asiatic elephant reaches a shoulder height of about nine feet—very large bulls may stand ten feet. The average weight of

an Asiatic elephant is approximately three and a half tons, with a maximum of six tons. The skin is grey, lighter in tone and somewhat smoother in texture than the hide of the African varieties.

Once in a while we come across a "white" Asiatic elephant—not really snow-white but rather clouded by a slate-grey cast. The experts distinguish three subspecies of Asiatic elephants, although for the most part the differences are not too clearly marked. There is one clear-cut distinction in the case of the Sumatra elephant—it has no tusks.

The Asiatic elephant has a bulging, protuberant forehead, but its ears are relatively small as compared with those of the African elephant. The tusks of the male reach a length of about eight feet—ten at most. Figures for maximum weight vary between 126 pounds and 161 pounds! In the female, tusks are either lacking or else so reduced in size that they rarely project beyond the lips. The trunk has only one finger-like lobe at the margin of the tip. There are five toes on the front feet and four toes on the hind feet.

### Asiatic Elephant

An elephant in Ceylon showing one of the many ways the trunk is utilised.



# Hyraxes

Picture, if you can, a rabbit without a tail, and with short legs and small ears. This will give you some idea of what a hyrax looks like. Hyraxes, also known as "dassies" or "conies," are rock-dwellers for the most part, though a few live in trees. Excellent climbers, they can scale the face of an almost perpendicular rock or tree trunk. They are very active, timid little creatures, always on the alert, ready to dive for safety in the rocks on the least provocation.

Limited to the Old World, the hyraxes are spread over most of Africa, and have a range that extends north through the Arab countries to Asia.

These strange little animals have such marked peculiarities that scientists have placed them in an order all by themselves (Hyracoidea). Hyraxes are vegetarians, and their teeth are of the kind we see in certain hoofed mammals, particularly rhinoceroses. From their foot structure, we can tell that somewhere along the line in past history there was probably a connection between these little fellows and the lordly elephants. The four-toed feet of hyraxes end in blunt claws resembling miniature hoofs. As for the soles of the feet, they are naked but cushioned with well-developed footpads.

The family Procaviidae, which takes in all the hyraxes, is divided into three groups. The species making up these groups are all very similar in size, appearance, and general structure.

**The Grey Hyrax, or Rock Hyrax, *Heterohyrax*,** lives among rocks in colonies ranging from half a dozen to fifty animals.

They feed on green vegetation during daylight hours but may continue feeding into the night. The young—there are two or three in a litter—are fully clothed and have their eyes open at birth.

These sociable creatures have a shrill communicating cry. When a hyrax looks outside its den and finds no imminent danger, it gives the all-clear signal. This



## Grey Hyrax

**This hyrax makes its home in many parts of Africa and Asia.**

is relayed by other members of the colony until the rocks resound with their cheerful voices.

**The Tree Hyrax, *Dendrohyrax*,** has longer and softer fur than the rock hyrax and is a little larger in size. A native of the heavily forested regions of Central and South Africa, especially of the Congo, the tree hyrax is a solitary creature. Usually a single animal makes its home in a hollow trunk or in the thick foliage of a tree. Frequenting only the tallest of forest trees, it feeds on the leaves of the uppermost branches. It restricts its wanderings

## Big-toothed Hyrax

to the night, never leaving its roost until after sunset.

However, you must not conclude that the tree hyrax lives an exclusively "lone-wolf" existence, for it carries on a continual discourse with its neighbours. Its cry is a long-drawn-out howl or roar, swelling in volume. This goes on for half an hour, almost without interruption. It is only the males that howl, usually one at a time. These performances may last from soon after sunset until two o'clock in the morning.

Families are not large; occasionally there are twins, rarely more. The young—as among the rock hyraxes—are horn fully furred and with eyes wide open.

**The Big-toothed Hyrax**, *Procavia*, the common African type that lives in colonies, is found almost anywhere on the continent where there are sizable outcrops of rock. Its head and body length is about twenty inches; the tail is a mere stub, less than an inch long. The rather coarse fur is brownish grey, though the shade varies quite a bit.

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# The Odd-toed Hoofed Mammals

The horse family is made up of asses and zebras in addition to horses. But the horse family is only part of a larger group, the order of odd-toed hoofed mammals. This order, known as Perissodactyla ("odd-fingered"), also includes tapirs and rhinoceroses. The order has no representatives in Europe, in the Americas north of southern Mexico, or in Australia. The tapir, the only member of the order alive today in the New World, is not found in Africa.

Representatives of this order are not "ruminants"—they do not chew their cud. They have front teeth in both upper and lower jaws and, with the exception of the rhinoceros, do not have antlers or horns.

An interesting point about the odd-toed hoofed mammals is this: when scientists gave the animals this name, they used the term "odd-toed" to refer to the *structure* of the foot, not the *number* of toes. These mammals have an enlarged third toe, which extends up into the main leg-bone and bears all or a large portion of the weight of the body. This is especially true of the horse family, which has only one toe, and also applies to the other animals of the order, which have more than one toe. (Of course, whatever the number of toes, they are encased in a hoof.) As you will see later, there are other hoofed mammals that rest the weight of the body on *two* toes. We call them even-toed hoofed mammals.

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## Odd-toed Hoofed Mammals: I

### The Wild Horses

When scientists want to explain how the strange animals of the past—the weird-looking creatures whose bones we see in museums—developed into our familiar

modern mammals, they often take the horse as an example. And with good reason—what could be more remarkable and clearer than the development of the

## Wild Horses

"Dawn Horse" (*Eohippus*), a little, fox-like creature only eleven inches high, into the tall and stately horse that we know so well today?

The origin of the horse dates back some sixty million years to the Eocene period—the "Dawn Age" of mammals. The early horses appeared almost simultaneously in Europe and America. These small creatures had four toes on the front feet and three toes on the hind feet.

It was in America that the horses passed through the greater part of their evolution. Having neither horns nor claws to protect themselves with, they had to depend on speed. In the course of millions of years, the centre toes, which bore most of the animals' weight, grew larger and larger, while the outside toes became smaller and smaller. What was left in the end was one vastly enlarged "toe"—the hoof. This was naturally much more suitable for swift running on hard, dry land than the original toes which it replaced. At the same time, horses grew in size; their weight increased from the hundred pounds or so of the Dawn Horse to the thousand pounds and more of later horses.

The horse seems to have had a chequered career—after all, a lot can happen in sixty million years. We possess good evidence that the horse died out in Europe at an early date; as for Asia, its supply of horses was restocked from America by way of a land bridge that once joined Siberia with Alaska.

Man has been breeding horses for centuries. He has many uses for these animals. Sometimes he needs a large, powerful creature; again, he may require speed. Temperament also matters, just as it does among humans: some kinds of horses must be placid, others mettlesome. The prizewinner at the horse show and the pit pony in the coal mine each have their clearly defined roles.

Horses are either purebred or crossbred. If both its parents are of the same breed, a horse is said to be purebred. A crossbred horse, then, is one with parents of different breeds. Purebreeding will intensify a given quality, possibly at the expense of others; crossbreeding, under favourable conditions, has brought about desirable combinations of good qualities.

People are prone to confuse purebred horses with Thoroughbred horses. The distinction is clear-cut and important. A purebred horse may be of any breed, as long as its parents also belonged to that breed. A Thoroughbred is a *specific* breed of horse. Every Thoroughbred is necessarily a purebred horse; but many purebred horses are not Thoroughbreds.

The horse family is made up of asses and zebras as well as horses. Named after the horse—*equus* in Latin—this family (Equidae) is remarkable for the development of the foot. In all these animals, the foot has been reduced to a single digit, originally the third toe. This toe is enclosed in a compact, horny hoof.

The ankle and wrist have been raised high off the ground, becoming the so-called "knee" and hock of a horse. Such animals are adapted for high speed on hard, solid ground. Their teeth, with high crowns that gradually push upward with wear, are specialized for grazing and grinding close, coarse grass.

These animals have a long tail of whip-like hair. They use it to disperse the usual host of house flies and green horse flies—and also the more serious pests like the gadfly, which punctures the skin and deposits its eggs under the surface.

The equines are sociable creatures, living in herds that may contain hundreds of animals. They breed about every other year. Mares usually have a single foal, born in an advanced stage of development. Its eyes are open and it is able to stand

unsupported a few minutes after birth.

**Przewalski's Horse**, *Equus przewalskii*, is the only wild horse left on earth today. True there are many so-called "wild" horses in different parts of the world. However, excepting Przewalski's horse, they are all descendants of domestic animals that have escaped from captivity.

Przewalski's horse first came to the notice of zoologists when the explorer for whom it is named brought back a skin and skull from his Asiatic journeys. The animal is a sturdy, comparatively small pony that stands about four feet at the shoulder. It has a rather large head, small ears, and heavy jaws and teeth. The mane is short and erect, but the tail is long-haired all the way. The summer coat is reddish brown with some white about the muzzle; in winter, the coat is longer and paler.



**Przewalski's Horse**

This species is the only truly wild horse now in existence.

The range of Przewalski's horse is limited to the plains of the Altai Mountain region and extreme western Mongolia. In April or May, probably eleven months after mating time, the mares are ready to foal. At this time they retreat to quiet places where food and water are plentiful. Przewalski's horse interbreeds freely with "wild" ponies of the region, and hybrids are not uncommon.

**The Donkey** has an honourable history—the animal has served man well for many thousands of years. Derived from the Abyssinian or Somali Wild Ass, which is still in existence, the donkey was probably domesticated in the New Stone Age, some twelve thousand years ago. The name "ass" probably stems from the word *athôn*, which is Hebrew for she-ass. "Donkey" is a nickname derived from the animal's supposed dun colour.

The ass has a shorter mane and shorter tail hair than the horse, and only the end half is provided with a brush. Of course its ears are much longer than those of a horse. Superior to the horse when it comes to carrying loads, the donkey is famous for its sure-footed negotiation of dangerously narrow mountain trails. Man has employed the donkey since time immemorial as a pack and draft animal. The Egyptians used it extensively in their monument-building as far back as 3,000 B.C.; they do not seem to have had horses until 1,900 B.C.

Despite its reputation for stubbornness and stupidity, the donkey has accomplished much of man's "dirty work" under singularly unrewarding conditions and often savage treatment. A patient and long-suffering creature, it outlives the horse; the donkey has a life expectancy of from twenty-five to forty-seven years. There is usually one foal at a time, about nine months after mating.

## Mule

**The Mule** is a cross between a male donkey and a female horse. Both sexes of the mule are almost always sterile. These hybrids rarely gallop and have a feeble bray unlike the voice of either an ass or horse. The cross between a male horse and a female donkey is known as a "hinny." It is smaller and inferior to the mule.

Man has bred mules since prehistoric times. They are now used largely for military transport, being particularly valuable in mountain warfare. Darwin tells us that troops of mules in South American mountain regions are led by steady old mares. These *madrinas* ("grandmothers") carry a bell. The mules show great affection for the *madrina* and it is almost impossible to separate them from her.

**The African Wild Donkey, or Somali Wild Ass, *Equus asinus somalicus***, is probably the stock from which the domesticated donkey was derived. A handsome, strongly built animal, it stands about four feet six inches at the shoulder. Unlike the Asiatic wild asses, it has very large, long ears and narrow feet. The African wild ass gives voice to the loud bray of the familiar donkey—a very different sound from the squeals and guttural blowing of the Asiatic asses. The general body colour is grey with white under parts, relieved by a white muzzle, a white patch around the eye, a black stripe down the back and another across the shoulders.

Both the Nubian wild ass and the related Algerian wild ass are now extinct in the wild state. However, several local variants—the Sudan, Somali, and Red Sea wild asses—still exist in limited numbers. These African wild asses frequent low, stony hill country and bleak wastes. They have a reputation for great speed and sure-footedness in rough country.

**The Mongolian Wild Ass, *Equus hemionus***, also known as the Chigetal or Dzigitai, is a typical desert animal, slightly smaller than its North African cousins and with smaller ears. It dwells in the arid regions east of the Altai Mountains to Lake Baikal and the central Gobi Desert. The general colour of the body is chestnut, varying from a greyish tone in the long winter coat to a more reddish shade as summer comes on.

**The Onager, or Persian Wild Ass, *Equus onager***, known as the Ghorkhar in India, is somewhat smaller and more slender than the Mongolian wild ass. Its general colour varies from cinnamon brown in the summer coat to yellow brown in the winter coat. This animal lives in the desert regions from Persia and Syria to north-western India. It has a close relative in the wild ass of Baluchistan and western India, a comparatively light-coloured creature.

**The Kiang, or Tibetan Wild Ass, *Equus kiang***, the largest and most handsome of the Asiatic wild asses, ranges over the high mountain plateaus of Tibet at altitudes up to sixteen thousand feet.



Except for its larger size and slightly different colour pattern it is much the same as the Mongolian wild ass.

**The Zebra.** The reader is doubtless familiar with the classic question about the zebra—is it a light-coloured animal with dark stripes, or a dark-coloured animal with light stripes? Here is the verdict of science: the colour pattern of the zebra consists of dark or black stripes on a light background. The animal, therefore, is white—or nearly white—with black stripes.

The attractively striped horselike animals that come under the popular name of zebra are the representatives of the horse family in eastern and southern Africa. Zebras resemble asses in having a short, erect mane, large ears, and a large head. In most zebras, the hoof is narrower than a horse's hoof, but broader and more rounded than an ass's hoof. The Mountain Zebra has the large ears of the Somali wild ass and similar small narrow feet.

The zebra is choice food for the lion—wherever zebras are present in abundance, there you will find lions as well. Once struck down by a lion a zebra makes little show of resistance and succumbs quickly,

resigned to the inevitable.

Ordinarily quick with its heels, the zebra also has important offensive weapons in its teeth. Wild dogs and other flesh-eaters seldom attack it—always with the important exception of the lion. Luckily the zebra possesses several defences against the lion. It has a good sense of smell and excellent eyesight. The famous striped coat is helpful, for the stripes blend well with the shadows of branches against sunlight or moonlight.

Zebras drink regularly and are rarely more than five miles away from water. On their way to drink they are always on the alert for lions. They have no fixed time for drinking, but generally they approach a water hole late in the evening or early in the morning. However, the author has seen zebras at a water hole in the middle of the day.

A herd of zebras on their way to water are usually led by an old stallion; first galloping ahead, he pulls up short of the water hole to look for lurking lions. Satisfied that the approach is safe, he gives the "all clear"—a low neigh—and the herd moves in to drink. They are always nervous and alert when drinking, as if expecting lions—and seem relieved when they get away from the water on to the open plains.

There are three kinds of zebras living today, and one extinct variety. **Grevy's Zebra**, *Equus grevyi*, is the largest and one of the most elegant of the striped ponies. It stands four feet six inches at the shoulder and weighs between five hundred and seven hundred pounds. The entire head and body are finely lined. Grevy's zebra lives in the open brush-covered plains and in the lowlands of Abyssinia, Somaliland, and northern Kenya. The mare is just as big as the stallion.

**Burchell's Zebra, or Bontequagga,**

**Mountain Zebra**



## Quagga

*Equus burchelli*, the common broad-striped zebra of Africa, dwells in most of the southern and eastern parts of the continent, where it frequents open plains, hills, and lightly forested country. This small-eared animal stands four feet two inches at the shoulder. The **Mountain Zebra**, the smallest of the stripped ponies, is the most asslike of all, and perhaps the most attractively marked. It is confined to the mountains of South Africa.

The **Quagga** is now extinct; the last living individual died in 1872 in the London Zoo. Originally found in herds on the open plains of the Cape Colony, the quagga differed greatly in colour and pattern of marking from Burchell's zebra. Nevertheless, the two animals are believed to have been closely related.

Essentially grass-eaters, zebras are fond of lightly forested country. They reach their maximum in brilliance and colour

pattern in the wooded portions of Central and East Africa. South and westward, as the forests thin out and the region becomes more arid, there is a gradual weakening of the striping. In the quagga of the south the stripes were dark brown and restricted to the neck and head. Zebras love to take dust baths and sand baths, and zebra country is full of well-worn rolling grounds.

The zebra's first burst of speed is remarkable; for more sustained running, it is credited with a speed of forty miles per hour, as timed by a car speedometer. The zebra has been domesticated and run in harness for exhibition purposes, but it is not to be trusted. It is stubborn and tires quickly when put to work.

Life expectancy for zebras in the natural state is about fifteen years, but they have lived as much as twenty-nine years in captivity. There appears to be no fixed breeding season, and the young are born about a year after mating.

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## Odd-toed Hoofed Mammals: 2

### The Tapirs

When you compare it with the highly specialized mammals of the modern age, you can see that the tapir is a strange, primitive creature. Its snout and upper lip are lengthened into a short, thick, flexible trunk that is used to draw twigs and branches into the mouth. It is a stockily built animal, with short legs and a plump, thick-skinned body covered with short, close hair. Its tail is a mere few inches long, the eyes are small, and the ears, of medium length, extend out and up from the sides of the head.

The tapir has four toes on the front feet, and three on the hind feet. The third toe, as we have seen in the case of the

horse family, is the central axis of the foot. The tapir can spread its toes, which are encased at their ends in a small hoof. As already suggested, this animal is the only living odd-toed hoofed mammal that is native to the Americas.

Our tapirs of today are the last of a great race that all but vanished in geological time. Eventually they were left on opposite sides of the earth, without connecting links. The prehistoric tapirs were spread across the Northern Hemisphere, but today we find these animals only in the Malayan region of southern Asia and in two parts of the New World: Central America and northern South America.

They have a distinct family all to themselves, the Tapiridae.

Timid, inoffensive creatures, tapirs live in swamps or near watercourses. Taking readily to the water, they are said to be able to dive and walk along the river floor. Tapirs feed on water plants and browse on forest foliage. Active only at night for the most part, they are more or less solitary; no more than two or three individuals are ever seen together. Tapirs have no fixed breeding season. Usually one offspring is produced; twins are rare.

Taken young, the tapir is quite docile and can even be expected to return if it is permitted to roam in the forest by itself. In South and Central America its only natural enemy is the jaguar; in Malaya the tiger and leopard assume this role. Putting up a creditable fight if cornered, the tapir can usually make good its escape if it has access to water.

**The South American Tapir,** *Tapirus terrestris*, dwells in the warmer parts of South America, with a range extending from Panama to Argentina, Bolivia, and Paraguay. This blackish-brown animal is common in the forests of the Guianas, Venezuela, and Brazil, where the natives hunt it with the help of trained dogs. When hard pressed in such hunts, it is said to kick violently—sometimes it will seize a hound in its teeth and shake it furiously.

**The Mountain Tapir, or Pinchaque,** *Tapirus roulini*, dwells in the mountain forests of Ecuador and Colombia up to elevations of eight thousand feet. It has a rounded head and is covered with coarse blackish hair about an inch long.

This animal gets its scientific name from Désiré Roulin, a doctor and zoologist, who accompanied Jean Baptiste Boussingault, the illustrious French scientist,



#### South American Tapir

These tapirs vary in colour from dark brown to a light, creamy fawn.

from 1824 to 1827 on his Andean explorations. While crossing the bare mountain heights of the Andes in Colombia, Roulin came across this strange-looking animal, which resembles the typical South American tapir but has long, thick hair like a bear's. Roulin made a remarkable drawing of the creature, which has only recently been published.

**The Central American Tapir,** *Tapirus bairdii*, ranges from southern Mexico to Panama, from sea level up to six thousand feet in the mountains. While the adult is uniformly blackish brown in colour, its throat, chest, and face are more or less whitish. The head and body length comes to six feet five inches; the tail is only three inches long. A large male may weigh up to six hundred pounds.

**The Malay Tapir,** *Tapirus indicus*, lives in the Malay Peninsula and north as far as Tenasserim, Burma. It stands three and a half feet at the shoulder and weighs about five hundred pounds. Its colour is partly a soiled white, partly black or blackish.

## Odd-toed Hoofed Mammals: 3

# The Rhinoceroses

The rhinoceros, a huge ungainly creature, is actually, or comes close to being, the second largest of all land mammals (the African elephant is the biggest; the hippo vies with the rhino for second place).

Consequently, it is hard for our minds to accept the fact that the rhinoceros, sizable as it is, can rate only as a miniature, compared to one of its ancestors. Millions of years ago *Baluchitherium*, a hornless rhinoceros, had its heyday. This giant of central Asia stood seventeen feet nine inches at the shoulder and measured thirty-four feet from the tip of its big nose to the end of its tail!

However, the rhinoceros is no midget. Its great bulk renders it practically immune to attack by lions, tigers, and other natural enemies. We might think, then, that the rhinoceros would be a contented, not to say complacent, creature. Not so!—though generally non-aggressive, to be sure, this hulking mammal is surly and unreliable in temper. When suddenly confronted with danger, it is apt to charge without provocation. Given time to digest the situation, it will usually seek safety in flight.

Why does the rhinoceros tend to charge on sudden impulse? We do not quite know. It has fairly acute senses of smell and hearing, but its eyesight is none too good. Perhaps the headlong dash of the rhinoceros is instinctive, handed down from an age when the flesh-eaters were more powerful and less discriminating when scanning for food. (The rhinoceros itself is a strict vegetarian, limited to green foliage, grasses, and the like.)

At any rate, some present-day observers

believe that the precipitate rush of the rhino may be due to curiosity, or perhaps its nearsightedness. Others claim that the animal is anxious to protect its young.

Today we find rhinoceroses only in the warmer parts of Africa and Asia and in Indonesia. But these behemoths, survivors of a bygone age when armed might was a determining factor in survival, once ranged over the entire Northern Hemisphere. The woolly rhinoceros, a prehistoric creature that lived millions of years ago in northern Europe and Asia along with the woolly mammoth, has been discovered in a remarkably good state of preservation, frozen in the Arctic ice. This find was uncovered in Siberia in 1731.

The rhinoceros is a great, clumsy beast protected by a thick, scantily haired hide. Its legs are on the stubby side and its three-toed feet are shod with a broad, horny, compact sole. Its massive head is concave in front.

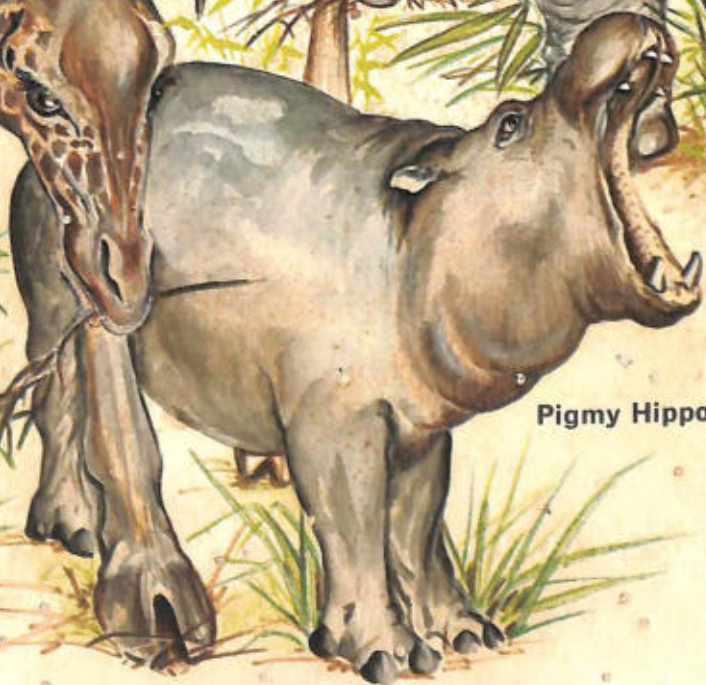
This head is armed with one or two horns that continue to grow throughout the rhino's life. We might plausibly suppose that the horn is connected to the skull by means of a bony core. The fact is, though, that the horn is merely an outgrowth of the skin, and is composed of a well-consolidated mass of hair. It is the horns that give these creatures their family name (Rhinocerotidae—"nose horns").

The rhinoceros is considered a good swimmer. It loves to wallow in mud and bathe in dust to rid itself of ticks and other skin parasites. Some birds make a practice of picking over the head or back of the

Reticulated Giraffe



Black  
Rhinoceros



Pigmy Hippopotamus

## African Black Rhinoceros

animal, and are even enterprising enough to enter the rhino's ears in search of these insect pests. Tick birds also act as lookouts, giving warning of approaching intruders by their noisy, scolding chatter.

**The African Black or Hook-lipped Rhinoceros**, *Diceros bicornis* ("two-horned"), is the common species of Africa. Standing five feet at the shoulders, a full-grown male may weigh as much as three thousand pounds. Its upper lip, extended into a point, is prehensile for grasping twigs and leaves and drawing them into the mouth.

This rhino, as we can tell from its name, has two horns; it sometimes happens that females have longer horns than the males. As a rule, the front horn is the longer of the two, the record length being fifty-three and a half inches. The average length, however, is about half that much.

There is no doubt that the black rhino has an excellent notion of local geography, and a sense of smell that is keen without being on a par with the elephant's or the buffalo's. Likewise its sense of hearing serves it well; but when it comes to vision, this animal, like all its cousins, scarcely sees any better than a nearsighted man without his glasses.

Certain African natives kill the black rhinoceros with their elephant spears. (Interestingly enough, they fear it nowhere near as much as they do the elephant.) The rhino's tough hide, half to three-quarters of an inch thick, makes splendid fighting shields; the natives bleach it almost white. As for the rhino's flesh, it is, as you might expect, coarse grained and rather tough. However, the Africans pound it with stones till it becomes fairly palatable. They consider the liver a great delicacy.

The black or hook-lipped rhinoceros usually has a home territory about ten

miles in diameter. Inside this area there must be a water hole or other drinking place. If the water dries up, the beast will find a fresh supply somewhere else. It usually goes for a drink about midnight, but there is no fixed time. Although early morning and evening are the times of greatest activity, the black rhino may be abroad any hour of the day or night. It is an unsociable creature, and it is a rare occasion when we find more than two or three individuals (including a calf) together.

There was a time when the black rhinoceros was common over most of Africa south of the Sahara; today it is plentiful only in East Africa. Though steep, rocky hill country is the ideal habitat for this animal, the author has often seen it on the plains. Like other members of its family, this rhino makes a ritual of rolling in the dry dust bowls. It is never so happy as when wallowing in soft, wet mud. Narrow, winding trails of the rhino lead in all directions from the wallow back into the bush.

Primarily a browser, the rhino feeds on the shoots and leaves of low bushes; it is also partial to twigs, as well as herbage and some long grasses. It does most of its feeding during the early morning, late evening and night.

Despite its short legs and great body, the rhinoceros can keep abreast of a car going twenty-eight miles an hour. Charging, the animal can do thirty-five miles an hour. Just as we would expect, it is not quick in turning, and it is easy to dodge a charging rhino—if you do not get panic-stricken.

There is one creature to which the rhino always courteously concedes the right of way—the elephant. The chances are that it has learned from long experience to respect its formidable associate of the African veld.



### **Great Indian Rhinoceros** **The largest rhinoceros of Asia.**

There is no fixed mating season for the black rhino. Reproduction is slow in this family, the young being born about eighteen months after mating time. There is usually one calf, weighing about seventy-five pounds. After a few hours, it is able to follow its mother around. But though the calf is quick to obtain the mother's care, it is slow to relinquish it. The youngster is suckled for about two years, and continues to stay with her until more than half grown. The mother will not mate again while she has a calf with her.

The life expectancy of the black rhino in the wild state is probably not over twenty-five years. A captive animal lived to the age of forty-seven.

**The White Rhinoceros, or Burchell's Rhinoceros, *Ceratotherium simum*,** is also known as the square-lipped rhinoceros. It is the biggest of all the rhinos. Standing six and a half feet at the shoulder, the white rhino weighs up to four tons. Despite its bulk, this giant, like the elephant, has an uncanny knack of slipping silently away, even in dense thickets.

Among the white rhinos, both sexes have two horns, the front one being about twice the length of the rear one. It is not unusual for the front horn to measure three feet in length; the recorded maximum is five feet.

Actually, the colour of the white rhino's hide is smoky grey. View it by bright moonlight on the grassy plains, however, and the animal really appears white; so perhaps its name is not so inappropriate as many highly critical observers have claimed. In any event, the normal tone of the skin is somewhat obscured by the colour of the mud in which the rhinoceros wallows ecstatically.

The white rhinoceros seems mild tempered and slow compared to its more nervous and highly irascible black relative; and it is correspondingly less likely to charge blindly at a possible foe. It is more sociable, too. White rhinos frequently gather in parties that include a bull, a cow, and calves of assorted ages.

When feeding, the white rhinoceros moves slowly upwind as it grazes during the cool early morning and evening hours; during the heat of the day it slumbers peacefully under the ample shade of a tree. When disturbed, this ungainly beast makes off at a swift trot, its nose close to the ground. Pressed for speed, it will break into a gallop and keep up a fast pace for quite a distance.

It is estimated that the female white rhino has her baby about seventeen or eighteen months after mating time. Occasionally a cow will have twins, but such instances are rare. A calf is mature at about five or six years, and is then ready to breed.

Unlike the black rhino's calf, which tags along behind its mother, the white rhino's calf precedes the cow. The youngster is steered in the right direction by the pressure of the maternal horns on its

rump. When a cow, accompanied by its young, is shot, the calf will charge the intruder—just as the baby elephant does in the same pitiful plight.

Today the white rhinoceros dwells in a comparatively limited region in Central Africa. Formerly common on the grassy prairies of South Africa, this rhinoceros had practically been eliminated there at the turn of the century, with a few survivors left to enjoy the protection of the game preserve in Zululand, Natal. Strangely enough, there are no white rhinos in the area lying between the northern and southern limits of its range.

**The Great Indian Rhinoceros, or One-horned Rhinoceros,** *Rhinoceros unicornis*, is the largest rhino found in Asia. A big male may stand slightly more than five and a half feet at the shoulder and weigh about two tons or more. These creatures haunt the great plains of northern India, Assam, and Nepal, where the giant grass grows to a height of fifteen or twenty feet. Here the Indian rhino lives among the grassy runways like an enormous field mouse!

Both male and female are equipped with a single horn. It rarely exceeds a foot in length—though some rare specimens measure up to twenty-four inches.

The Indian rhino's thick hide is folded into plates or shields, hinged at the joints and studded with small rounded lumps which—by a slight stretch of your imagination—can pass for rivet heads. This beast is often described as the "iron-plated rhinoceros," and, imaginatively speaking, it does look as if it had been put together in a machine shop. The skin, dark grey in colour, is practically hairless—aside from a fringe on the ears and at the end of the tail.

The Indian rhinoceros is likely to show extraordinary fits of temper without the

least provocation. At such times it rushes about, uttering loud grunts, trampling down the bush, and cutting deep furrows in the ground with its horn. In the course of one of those seemingly meaningless displays of anger, it will furiously assault any moving object.

Even large bull elephants are not safe from the violence of this ill-tempered beast, and in the ferocious battle that ensues, a big tusker may acknowledge defeat and make a hurried retreat. In such duels the rhino is more likely to slash with its teeth than strike with its horn—the teeth are more effective weapons against the elephant's tough hide.

The female rhinoceros, despite these occasional ugly outbursts, is all sweetness toward her calf and very solicitous for its welfare. In the midst of her protective fury against intruders, she may suddenly decide that discretion is the better part of maternal care, and prudently lead her calf to safety in flight.

The young rhino is born about eighteen or nineteen months after its parents have mated. A newborn calf is about two feet high at the shoulder and weighs between 75 and 120 pounds. Born in a very advanced stage of development, the youngster is able to follow its mother soon after birth.

**The Javan or Lesser One-horned Rhinoceros,** *Rhinoceros sondaicus*, reminds us in many ways of its great Indian cousin. However, the Javan variety is more slender and smaller, with a shoulder height of about four feet six inches, and a weight of over a ton. It has only one horn, which may be as much as ten inches long in the male. A few females are hornless; most have a very small horn.

The Javan rhino's skin is cracked into a mosaic pattern of scalelike discs, and the folds on the foreshoulder meet over

### Two-horned Rhinoceros

the back of the lower neck. These folds in the Indian rhino curve backward toward the rear of the shoulder and do not meet.

Originally found in Burma, Assam, Indo-China, and through the Malay Peninsula to Sumatra and Java, the Javan rhino has been exterminated over most of its former range. It favours thick jungle and marshland, but it has also been found in forested mountain country.

**The Sumatran or Asiatic Two-horned Rhinoceros**, *Dicerorhinus sumatrensis*, is the smallest of the living rhinos, rarely exceeding one ton in weight and four and a half feet in shoulder height. This animal has two horns, one in line behind

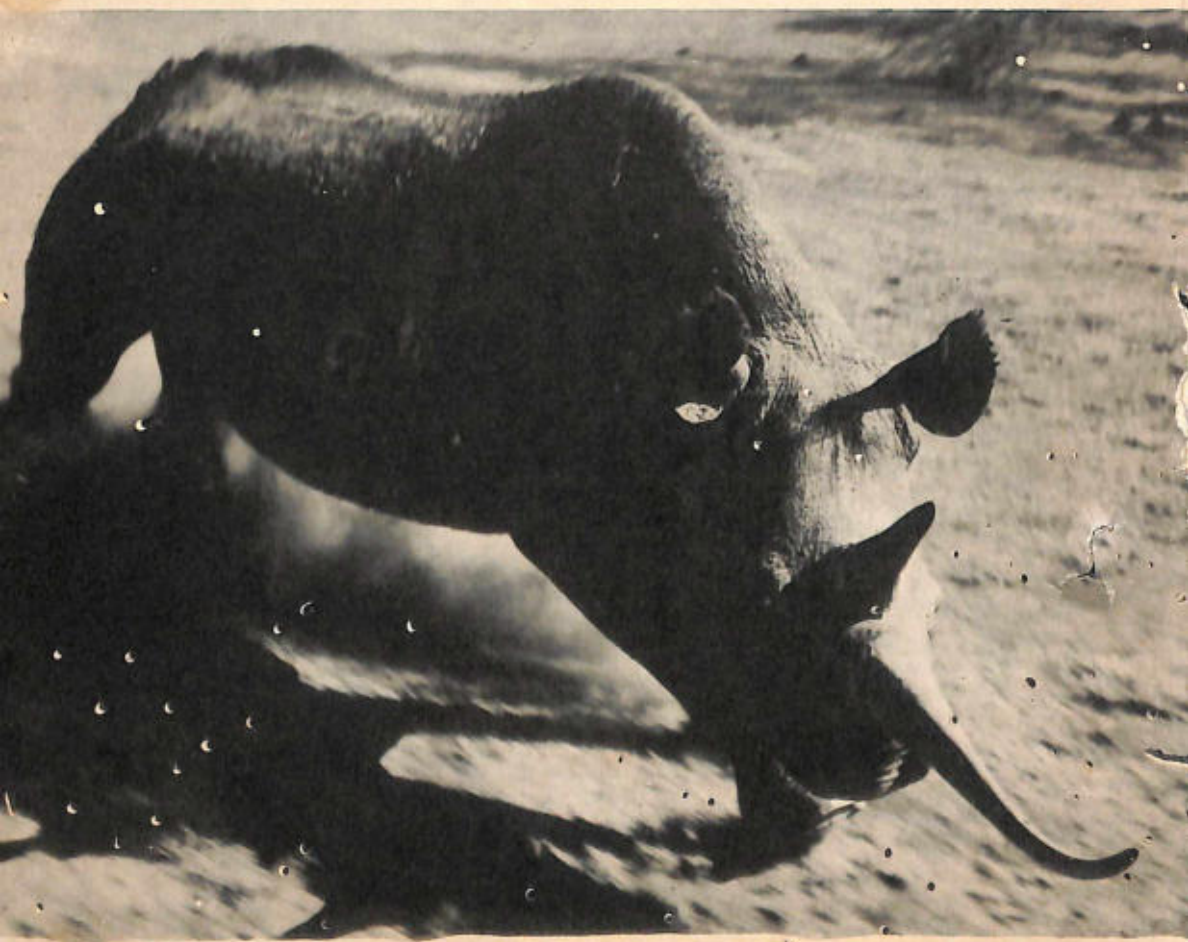
the other. The front one is the larger of the pair, reaching a length of fifteen or twenty inches in the male. The rear horn, placed between the eyes, is seldom more than seven inches long. The females' horns are smaller.

The Sumatran rhino often goes by the name of "the hairy rhinoceros"—the hair is hard to see but can easily be felt by hand. The newborn are covered with thick brown hair, which disappears in time.

Like the Javan rhinoceros, this beast frequents thick forest and bamboo country, where it leaves well-worn trails between wallows. Today the Sumatran rhino dwells in Sumatra, Borneo, and the Malay Peninsula.

### African Black Rhinoceros

This shows well the enormous power and considerable speed of the rhinoceros. The photograph was taken as the infuriated animal tried to ram a fast moving lorry.



# The Even-toed Hoofed Mammals

Although pigs have hoofs, these are not the same as the horse's or rhino's. Pigs belong to the large group of even-toed hoofed mammals. As we have seen, the term "even-toed" does not refer to the number of toes. These creatures have no first toe at all, and the second and fifth toes are often lacking as well. Where the second and fifth toes are present, they generally serve no major purpose.

So it is the third and fourth toes that matter, and that is why these animals are called "even-toed." On solid ground it is these toes that support the weight of the body. All the members of this order are called the Artiodactyla, a word meaning "even-fingered."

The group is in turn divided into three smaller sections, or sub-orders. These are:

*The Suiformes*—the ones that do not chew the cud: the pigs, peccaries, and hippopotamuses.

*The Tylopoda* ("knobby feet")—primitive ruminants, or cud-chewers, that have tusklike outer incisor teeth as well as canines in the upper jaw. In this group we find the camels, dromedaries, llamas, alpacas, vicuñas, and guanacos.

*The Ruminantia*—these are the true ruminants, that have no teeth at the front of the upper jaw. In this group are

all the animals that have paired horns or antlers supported by bony outgrowths of the skull: all the deer, antelopes, sheep, goats, cattle, and giraffes.

Of course it is not because they have horns or antlers that we call these animals ruminants. That word simply means that the creatures to which we apply it chew the cud. Their stomach, instead of being a simple compartment, is divided into a series of three—sometimes four—chambers. The first one is called the rumen (whence the group name). A ruminant has the advantage over other kinds of animals of being able to swallow large quantities of food quickly and store it up in the rumen. At leisure, the ruminant brings the food back up into its mouth and chews it thoroughly so that it can be digested easily.

It is interesting to observe how a ruminant chews its cud—the undigested food brought up from the stomach. As the animal chews, the lower jaw moves from side to side, but only the teeth at one side of the jaw are in contact at one time. After a brief period, the cud is shifted over to the other cheek and milled on that side for a while.

With these distinctions in mind, we may turn back to the pigs.

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## Even-toed Hoofed Mammals: I

### Pigs, Peccaries and Hippopotamuses

Have you ever observed a pig's snout? It is more remarkable than might be supposed. The snout is used to push, to lift, to dig and to break through tangled brush.

Such tasks call for an exceptionally durable organ, and the pig's snout answers that description well. At the end of the long, flexible muzzle the nostrils open on

## Wild Boar

a tough, flat, mobile, disclike plate. This is reinforced within by gristle attached to the skull.

As for the pig's mouth, it is noteworthy for the razor-keen tusks in particular. Usually—not always—the pair in the upper jaw are larger and curl upward. They are kept sharp as they rub against the tusks of the lower jaw.

Wild pigs are mentally alert and decisive in action. The ground is their native element—they don't climb trees; however, they can swim. They are sociable and love company. Living in forests or bush country, they depend largely on roots and tubers for food. But they also eat small animal life, fruit and berries.

Pigs are creatures of temperate and warm regions. We find them well distributed over the Eastern Hemisphere, including Madagascar, but not Australia. In the Western Hemisphere, the hog family is represented by the peccaries.

Extinct pigs, some of them gigantic, lived in Europe during the Pliocene age, which ended over a million years ago, after lasting about eleven million years. Man tamed some of their smaller descendants at an early date; in China, we have found bones of domestic pigs in New Stone Age sites, and the chances are that the Chinese domestication of the pig goes back well into prehistoric times.

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## Wild Pigs

**The Wild Boar**, *Sus scrofa*, is a powerful, rugged, sinewy creature. It is a forester, and is especially useful in breaking up the tangled mass of roots and excess growth on the forest floor and freeing timber from the stranglehold of vines and brush. Another way in which this animal is of great value is that its bristles are manufactured into the finest quality paint brushes.

That, of course, is a far cry from the actual living animal. The wild boar, in life, presents a most impressive appearance. It is the largest of all the wild pigs. Standing over three feet at the shoulder, it has a head and body length of almost five feet; a large boar weighs 350 pounds, sometimes even more. In colour it is dusky or greyish brown. Its coat is made up of long, coarse, black hair that overlays the thick, woolly, yellowish-brown underfur. The large, sharp, strong tusks may be almost a foot long.

The word "boar," by the way, is apt to prove confusing, as it can be employed in two senses. We say of all pigs that the

male is a "boar" and the female is a "sow." But the term "wild boar" refers universally to a species, male and female, and that is the way it is used here.

The killing of a wild boar and the serving of its head at Christmas in England dated back to the ancient custom of making a boar offering to the goddess Freya at the winter solstice. In those days people worshipped the boar as a symbol of fertility of the land, and hunted and killed it with colourful pageantry. The English custom of eating a roasted sucking pig on feast-days is a survival of these ancient ceremonies.

The wild boar is relatively prolific; there are likely to be two litters a year, with four to six babies in each. After mingling with the sows during the mating periods, the males then separate into small bands by themselves. When "pigging" time comes, the sow—she is now described as being "in farrow"—makes a fairly comfortable den in the thick brush. The young, though small at birth, are quite active; they are brown in colour,

with lengthwise dark stripes and spots.

Once the offspring are old enough to travel, the groups of sows and their young (known as "sounders") join company. By the time that the acorns begin to fall in autumn, there is a general migratory movement to groves of oak trees. In Iran, at this time of the year, the hillsides are often black with teeming herds of wild boars.

In the past the famous wild boar roamed over all the forested parts of Europe, east across Asia and Siberia to the Pacific coast, and south into North Africa. As with most animals that are spread over an extensive range, the wild boar varies quite a bit in appearance, depending on the localities where it flourishes.

**The Soor, Indian or Crested Wild Boar, *Sus cristatus***, is the common wild pig of India. Formidable when aroused, it has been known to kill a tiger. It stands almost three feet at the shoulder and weighs about 250 pounds. A distinct crest of long, stiff, black bristles extends from the back of the head down the neck to the shoulders.

Like its northern relative, the crested wild boar lives in the forests and builds a nest of leaves and sticks for raising its offspring.

**The Babiroussa, or Celebes Pig Deer, *Babiroussa babiroussa***, is not considered a true pig. However, it does belong to the hog family, and not to the deer family as one of its names implies.

A strange-looking, unlovely creature, the babiroussa is almost completely devoid of hair, and the bare grey skin is lined and heavily wrinkled. The whole animal appears to be wedge-shaped, but in reverse, tapering down evenly from the high hindquarters to the low shoulders



#### **Babiroussa**

**This unusual hog has the tusks of the upper jaw piercing the top of the snout.**

and the snout of the pointed, relatively small head.

The most remarkable feature of the babiroussa is its weirdly shaped tusks, which may measure as much as seventeen inches. In the upper jaw of the male these teeth, instead of projecting outward as in most other pigs, rise straight upward, piercing the skin of the upper lip, then turn backward in a sweeping curl; they may even reach the forehead! The lower tusks are shorter and more slender. Such fantastic tusks seem to be of little or no use to the animal and are a mere "sport" of nature.

The Celebes babiroussa is a herd animal with the habits of most wild hogs. It dwells in jungles and woodlands, preferably in locations near water, since it is an excellent swimmer. This wild swine, which stands somewhat over two feet at the shoulder and weighs a bit over 125 pounds, has frequently been domesticated by native tribes.

**The African Bush Pig or Red River Hog, *Potamochoerus porcus***, is a wary creature but fierce and tough as well.

## Giant Forest Hog

Seldom seen (it is active at night), it frequents the dense bush and heavily forested regions.

To the Boers of South Africa, this animal is known as the Boschvark (literally, "bush pig"). The bush pig's coat varies in hue from reddish brown to dark grey or black. Long, tufted ears border the face, which is marked by two pairs of gristly warts growing over bony bases—a large pair in front of the sunken, typically piggish eyes, and a smaller pair behind.

The African bush pig dwells south of the Sahara Desert. It averages a little over two feet at the shoulder and weighs about two hundred pounds. It has a relative on Madagascar—the only member of the even-toed hoofed mammal group that is native to the island.

**The Giant Forest Hog, *Hylochoerus meinertzhageni*,** was discovered only as recently as 1904. Living in the deep forests, this secretive animal rarely comes out in the open, and we have been able to glean very little authentic information about its habits and life history.

We do know, however, that the giant forest hog is a "giant"—it stands thirty inches at the shoulder and weighs up to 265 pounds. It has very long, bristly hair and a broad, greatly expanded disc on the snout. The animal's range extends from Mt. Kenya west through the basin of the Congo River to the Atlantic coast.

**The Wart Hog or Vlakvark, *Phacochoerus aethiopicus*,** has the distinction, if you want to call it that, of usually being considered the ugliest creature on earth. Its head looks enormous in relation to its small, round, fat body, its short legs, and its small feet. With two pairs of warts on the sides of the flat scooplike face, and bleary little piggish eyes sunk in bags of wrinkled skin, the head is fantastically

repulsive.

Near the end of the broad snout are the tusks, which curl out to the side, then up and over. Ten inches is about average for the tusks, though some may measure up to twenty-seven inches. Aside from the few white whiskers on the face and the scanty mane of dark, long, coarse bristles, the animal has little hair. A large boar stands thirty inches at the shoulder and weighs two hundred pounds or more.

Active during all hours of the day, the wart hog favours the open grassy plains of Central and north-eastern Africa. Though this beast, like other hogs, will dig up the ground for roots and tubers, it is occasionally seen grazing on the plains with herds of zebra and antelope.

## Peccaries

**Peccaries** are forest animals and travel in bands ranging from a few individuals to as many as three hundred. Like the true pigs, they are rooters, feeding on tubers, roots, fruits, and other vegetable matter. But they also prey on small animal life, including snakes.

A peccary never misses a chance to kill even a large rattlesnake. With its mane and body hair bristling in all directions, the peccary fiercely charges to within three feet of the reptile, stops short, and feints it into striking. As the snake lies uncoiled for an instant, the peccary suddenly leaps into the air; with its back arched and its feet together, it comes slashing down on all four hoofs. Again and again it does this, until it has cut the snake to ribbons. (The domestic pig, it should be noted, is also an efficient destroyer of snakes in some parts of the world.)

We sometimes read tales of ferocious bands of peccaries attacking human beings. This makes interesting reading but has

## White-lipped Peccary

little foundation in fact. The truth of the matter seems to be that, in general, the peccary is a shy and retiring creature, fighting only for self-protection.

Peccaries are the only piglike animals native to America, but they are not true pigs. The most obvious differences that separate the peccaries from the Old World pigs include: the loss of the small outer hoof on the hind foot; straight tusks that point downward, in the upper jaw; a large musk gland on the back, about eight inches above the tail. The



### Collared Peccary

**Peccaries are the only wild pigs found in the American hemisphere.**

peccary's tanned hide, especially durable and popular as glove leather, can be recognized by the pattern of evenly distributed groups of three holes left by hair roots.

Both peccaries and Old World pigs behave in much the same way, though there is a slight difference in breeding habits. The den may be a hollow tree, or a nest in a thicket. At birth the young are about the size of a rabbit, and yellowish brown in colour with a black stripe down the back. Two babies are normal for a litter; occasionally there is only one, and in rare cases, there are three.

Pigs make up the family Suidae. The peccaries have their own family, Tayasuidae.

There are two kinds of peccaries, divided into smaller groups that differ a bit in size and markings, as well as the regions they live in. We find them all the way from southern Texas and Arizona down to Patagonia.

**The Collared Peccary, Javeline, or Musk Hog, *Tagassu tajacu*,** dwells in the extreme southern United States and south to Patagonia—sometimes at sea level, sometimes at altitudes of eight thousand feet. A light-coloured stripe almost circles the body at the shoulders to form a collar.

This animal is covered with thick, coarse, bristlelike hair, grizzled in colour. It does not have much of a tail. About twenty inches high at the shoulder, the collared peccary is three feet long and weighs about fifty pounds.

**The White-lipped Peccary, *Tagassu pecari*,** is larger than its collared cousin and lacks the shoulder stripes. Its coarse black hair is relieved by a white area that reaches from the chin nearly to the eye. This animal is not quite so far-ranging as the collared variety, living in the region that extends from southern Mexico to Paraguay. In South America the white-lipped peccary prefers low country.

## Hippopotamuses

"Hippopotamus" comes from the Greek and literally means "river-horse." It is a large, ungainly word, very suitable for this large, ungainly creature. The hippo, as we may conveniently call it, has a bulky, rotund body, and legs so short that its ample belly barely misses scraping the ground. Its enormous head rounds out into a bulbous snout.

## Common Hippopotamus

The hippo's nostrils and eyes are located quite strategically. The nostrils are placed forward and on top of the snout, while the small, bulging eyes are high up on the front of the head. When the animal is swimming, it can breathe and see while only the very top of its flat face is exposed above the water line. The ears, by the way, are small and rounded, set well back on the head behind the eyes.

In prehistoric times the hippo lived in Europe. In those far-off days, it was common in the valley of the Thames and ranged north to Yorkshire as a contemporary of primitive man. Eventually the hippos disappeared everywhere but in Africa, where they are now making their last stand.

The family name of the hippos is big, the content small. The Hippopotamidae family contains just the Common Hippo and the Pygmy Hippo.

**The Common Hippopotamus, *Hippopotamus amphibius***, once frequented most of the large lakes and rivers of Africa, but today we do not find it south of Zululand. It lives unmolested in crocodile-infested waters, too formidable an adversary for even these powerful reptiles. Its canines can rip through the crocodile's armour plate with one bite.

The hippo does not mind salt or brackish water. Not a fast or particularly adept swimmer, it is built for slow paddling and walking on the bottom in shallow water as it roots up water plants with its teeth. However, it swims powerfully enough to be able to make its way upstream against a strong current.

Though it feeds chiefly on the reeds and grasses that abound in and around watery surroundings, the hippo comes ashore under cover of darkness to raid the fields of the natives. Hippos frequently bask in the sunshine on the lakes and rivers of

Africa, each animal pillowing its head on another's back. How restful this may be is not clear, for some say that a full-grown hippo's head weighs a ton!

The hippo has an adjusting mechanism for the time it spends in the dry atmosphere, when it has come ashore to feed. It is equipped with special skin pores that secrete a thick, oily, pinkish substance. This secretion may also act as a protective measure against extended periods in the water. The process of giving off the pinkish fluid from the skin gave rise to the illusion that the hippo "sweats blood."

The hippo can float like a log or sink like ballast and run along the bottom of a lake at eight miles an hour. It generally submerges for about two minutes at a time, but it can stay under water for as long as thirty minutes if necessary. The valvelike nostrils close when the animal dives; as it surfaces, they open with a loud snort and a fine, moist spray is expelled a foot high. When a hippo sports at night, its blowings and snortings can be heard at a considerable distance. During the daytime the animal sleeps on a sandy bank or among thick beds of reeds.

The hippo will never win a bathing beauty contest, yet it is a most interesting animal to look at closely. Its size is most impressive. A hippo will weigh up to four tons, and stand four and a half feet at the shoulder. Its head and body length may come to twelve feet, and the tail is another foot long. Except for a few bristly hairs on the nose, head, and tail, the animal is naked. Its skin is thick and dark brownish in colour.

Next to the whale, the hippo has the largest mouth of any mammal. We get the impression that this beast takes great delight in displaying the awesome gape of its tremendous jaws.

The hippo's incisor and canine teeth

## Pygmy Hippopotamus

are large, with edges that are kept sharp as the teeth of the upper and lower jaw grind past each other when the mouth opens and closes. The lower canines may reach four to seven pounds in weight and over twenty-four inches in length. More than half of this huge expanse, though, is hidden beneath the gum line. These sickle-shaped teeth are well suited for cutting the tall reeds, grasses, and water plants on which the hippo feeds. The tusks are commercially valuable as a source of ivory. (However, the ivory they yield is very brittle, and splinters with the expansion and contraction produced by heat and cold.)

By now you may have gathered that the author has something of a special admiration for hippos. As a rule, he finds it hard to forgo an opportunity to photograph them. Some years ago, while he was taking a picture of a bull hippo swimming near the edge of a lagoon in East Africa, one of his companions fired a big elephant gun at the creature. At the time the members of the party were apparently standing on floating masses of vegetation. With the force of the shock of the gun's discharge, the vegetation tipped and the men lost their footing. Meanwhile the hippo sank, dead.

The meat of the hippo is rather stringy and has a machine-oil taste. Yet the natives love it, especially the fat, which they render down as lard. They claim that it never goes rancid.

A hippo is more active than is generally supposed. It can run on land as fast as a man and even gallop at a considerable speed. When running or walking, its legs are so widely separated on either side of its fat body that two parallel lines of tracks are left on the sand or mud.

Old bulls usually live alone, but twenty or thirty individuals may keep together and cover long distances in search of

food, often travelling twenty or twenty-five miles by river in one night. Usually, however, they will not venture more than a mile or so, in order to be able to get back to their sleeping quarters before daylight.

If hippos wander too far from water, they expose themselves to attack by lions. On one occasion, three of the big cats jumped a hippo and the deafening roar of the conflict could be heard at a camp a mile away. Dragging its assailants with it, the hippo managed to struggle along until it reached the water and escaped.

Hippos apparently object to campfires. Generally they voice their resentment with loud grunts, but, on occasion, they have been known to go further, climbing on to the shore and charging the offending fire, to the consternation of the campers. Aside from such grunts, the hippo's vocal achievements consist of low, panting breaths followed by trumpeting snorts that end in a roaring bellow of considerable volume.

Hippos are sociable beasts, gathering in herds of twenty to thirty. When mating time arrives, the bulls turn savage, and fight brutal battles among themselves for possession of the females. Often these duels end fatally as the fighters cut huge three-inch gashes in each other's hide with their sharp tusks.

Hippos mate once a year. Eight or nine months later, the female comes ashore or retreats to a bed of reeds to give birth to her single calf. The baby hippo weighs about one hundred pounds at birth and can swim before it can walk. Suckling usually takes place in the water. During the period of infancy the young rides its mother's back in the water.

**The Pygmy Hippopotamus**, *Choeropsis liberiensis*, frequents small rivers in deep forest country in Liberia and Sierra

## Camel

Leone in West Africa. It spends much of its time on land and sleeps during the day in a den under a river bank. A little under three feet at the shoulder and six feet long, this animal weighs a mere four hundred pounds—truly a pygmy among the hippos.

In general, except for being smaller and less sociable, the life, habits, and appearance of the pygmy hippo are quite similar to those of its huge relative. Even its life span in the wild state—thirty to thirty-five years—is the same; and the female gives birth to her baby after the same interval after mating.

### Common Hippopotamus

Although possessing one of the largest mouths in the animal kingdom, hippopotamuses are herbivorous.



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## Even-toed Hoofed Mammals: 2

### Camels and Llamas

Camels, on first acquaintance, appear to be supercilious creatures with smug, disdainful expressions. Worse yet—they may strike us as bad tempered, irritable, and obstinate. Seemingly placid and stupid, they are keen enough to resent actively any form of ill-treatment. With tenacious memory, camels will carry a grudge for a long time, waiting for the opportunity to get even when the offender is off guard. These beasts show their displeasure in a most unsavoury manner: they turn the head to spit contemptuously full in the face of the person they resent.

Their relatives the llamas are equally quick to show their annoyance. If they are loaded too heavily, they grumble in their guttural voices and often lie down and refuse to budge. They also spit at the offending driver—with remarkable accuracy. The charge consists of a dis-

gusting green mess of half-digested grass that is exploded violently through the mouth and nose.

But these qualities are only part—a very minor part—of the story of these animals, and their immense usefulness to man over a period of thousands of years.

The scientists tell us, surprisingly enough, that the camel family had its start, not in Asia as we might suppose, but in North America. That was about forty million years ago. By the end of the Pleistocene epoch, barely a million years ago, the camel family had spread to South America—and to Asia as well, by an intercontinental land bridge that existed in prehistoric times.

What about the camel family today? The camels and llamas make up a fast-waning group that has almost disappeared in the wild state. Only two truly wild

varieties are left. Both belong to the llamas, the New World branch of the family. Restricted to South America, the llamas frequent upland plains and, more generally, the highlands of the Andes. The camels, of course, are creatures of the Asiatic and African deserts.

The camel family (Camelidae) makes up the suborder Tylopoda, as we have seen—one of the groups in the order of even-toed hoofed mammals.

Camels are very hardy and can bear up under extreme privation. These are ideal qualities in a beast of burden that is used in regions ranging from broiling arid deserts to freezing mountain country.

The camel's body is covered with soft, fine, woolly hair, usually dark brown or yellowish brown in colour, from which high-quality cloth is made. The flesh and milk are food and drink to some native peoples. The hump of the camel is composed of fatty tissue used by the animal as a reserve of sustenance when the food supply runs low.

As for the stomach, it has three chambers. One of them is lined with water-storing cells that can hold upwards of a gallon. A camel can go three days without drinking and suffer little inconvenience. One camel has been observed to go thirty-four days without drinking; this, however, is far above the usual capacity for doing without water. Given free access to water, a camel will consume from five to seven gallons each day.

Camels are vegetarians and cud-chewers. Unlike the typical ruminants that keep the food on one side of the mouth for some time, the camel constantly works the cud from side to side with each clamp of the jaws. The tusklike outer incisor teeth and canines of the upper jaw, excellent for cutting herbage, can also inflict a severe and painful bite.

The creature's ears are small and

inconspicuous. Well-haired, slitlike nostrils can be closed against windblown sand, while a double row of heavy lashes protects the eyes from particles of flying grit. Long legs and broad feet are further adaptations for life on the shifting sandy wastes. The foot is made up of two toes provided with thick, cushioned soles and nail-like hoofs. Camels walk with a long, swinging stride. They pace—that is, the front and rear legs on the same side of the body move forward in unison. This produces a rolling effect that may have some connection with the animal's being called the "ship of the desert."

Camels do not have a fixed breeding season; they mate throughout the year. The baby camel is born 315 to 389 days after mating time. Throughout Asia and Africa we find two distinct species, the Bactrian and Arabian Camels; the regions where they live overlap to a certain extent. From time to time camels have been introduced with varying success in southern Europe, Australia, and even the United States.

### The Bactrian Camel, or Mecheri

*Camelus bactrianus*, is the two-humped camel common through central Asia from China to Turkestan. The average caravan of these pack animals travels at a rate of two to three miles per hour and thirty miles per day. Each camel bears a load of about four hundred pounds.

Though not so slender, handsome, or speedy as the African variety, the Bactrian camel is stronger and more heavily built. Measuring seven feet to the top of the hump, it has stout, moderately long limbs. The body hair is longer and shaggier than on the dromedary; this makes it possible for the Bactrian camel to withstand the rigours of the colder climate prevailing in its range.

## Llama

**The Arabian Camel, or Heirie,** *Camelus dromedarius*, is the one-humped camel of the hot, arid Arabian deserts. Slimmer and sleeker-looking than the Bactrian type, it is a riding camel, with longer legs, better suited for swift travel than for carrying great burdens.

This camel will keep up a pace of eight to ten miles an hour for eighteen hours—one animal has been known to cover 115 miles in eleven hours over the deserts of Egypt. The soles of the feet are softer and more tender than those of the Bactrian camel—hence the Arabian is less suited to hard and rocky terrain.

Whereas the Old World camel is a creature of the desert, its New World relative the llama dwells on grassy plains and mountain slopes. There are four kinds of llamas; two are domestic, while the other two may still be found in the wild state. These South American cud-chewers are slender and more lightly built than camels; they have long, pointed ears, a short bushy tail, and generally a thick woolly coat. The feet, like those of the true camels, are two-toed and padded on the soles. The back is not humped. The animals pace like the camels.

The **Llama**, *Lama glama*, was life to the Inca; its meat fed him, its wool kept him warm, its hide covered his feet, its fat was made into candles and gave him light. Its hair was twisted into ropes, and even its droppings were not wasted—they were dried and used for fuel to warm his body. The llama carried the Inca's burdens even up in the thin air at seventeen thousand feet. (Only the male, by the way, was used as a pack animal; it started to work at the age of three years.)

Knowing what a treasure they had in the llama, the Incas took very good care of the animal. They never harnessed it to a plough or a cart. They do not seem to

have taken milk from the llama, probably because the supply was too scanty; there was barely enough to feed the one baby llama that was born in February or March when the snow still drifted in the highlands of Peru.

Farmers packed the animal with small loads. They used its wool for textiles but never beat it into felt. They ate its meat, but never as a regular part of their diet. The Incas sliced the llama's flesh into thin strips and dried it in the sun. The Peruvian name for this emergency ration is *charqui*, a word that seems to have been corrupted by English-speaking people into "jerky."

**The Alpaca**, *Lama pacos*, is smaller than the llama proper, and more sheeplike in appearance. Its fleece may reach a length of two feet, barely clearing the ground. The springy yet silky fibres are woven into a strong durable cloth that is famous the world over. Both the llama and alpaca are domesticated types that are supposed to have originated from the guanaco. However, it may be that the alpaca is the descendant of a third breed that is now extinct.

**The Guanaco or Huanaco**, *Lama guanicoe*, ranges in herds of up to and over a hundred throughout the pampas of Argentina and Patagonia as well as in the mountains of Peru, Bolivia, and Chile. A good swimmer, it has been seen crossing from island to island in the Cape Horn region. In Patagonia there are great accumulations of bones, which may indicate either a natural communal graveyard or mass slaughter by the natives or early Spaniards.

The guanaco stands about three and a half feet at the highest point of the back. To many observers, this animal seems to be more like a hornless goat antelope than a camel in superficial appearance. Its

flesh is greatly relished by the Indian tribes in the vicinity of its range.

Up until a few years ago, the camel family was the only branch of the mammals that had been left untouched by the fur trade. (True, the wool of the alpaca, vicuña, and camel has been used from time immemorial for making fine cloth.) Originally a wild animal, the guanaco is now raised extensively on farms for its wool and also for its pelt, which is used by the fur trade for making short fur coats and for trimmings.

The guanaco's soft woolly hair is pale yellowish brown on the body, while the head is ashy grey. The newborn young are killed to obtain skins for the beautiful robes called *capas*. The pelt is sold under the name *Guanquito*. Used in its natural colour or dyed deep brown, it has a general resemblance to fox fur.

Guanacos mate in August or September, and the baby is born ten or eleven months later. The mother nurses the young for six weeks, weans it for another six, and after that the youngster is on its own. There is only a single young at birth!

**The Vicuña, or Vicugna,** *Vicugna vicugna*, was prized so highly by the Incas that they prescribed the death penalty for anyone who molested this beast without direct authority from the state. The fabric (known as *cumpi*) made from vicuña hair was reserved for Inca royalty. Human hair has been likened to a piece of wire as compared to a silky strand of vicuña wool. Thus, among the hoofed mammals, the animal has the same position as the chinchilla among the rodents.

A domesticated beast, the vicuña still lives in the wild state as well. Standing less than three feet at the shoulder, it is tawny in colour with a white bib on the brisket. Unlike most members of the llama group, it does not have an excessively luxuriant coat—hence the very high price commanded today for its wool.

Dwelling at very high altitudes on the slopes of the Andes, the vicuña ranges over Ecuador, Peru, Bolivia, and Chile. This animal travels in small herds of six to twelve females and their young, headed by a lone male. The herd leader, it seems, keeps watch from the highest point in the vicinity of the band. At the approach of danger, he utters a shrill whistle and covers the rear of the retreating herd.



Guanaco

Both the llama and the alpaca appear to be descended from this species. Guanacos are herd animals and live at high altitudes in South America.

## Chevrotains

Chevrotains, though they have no horns, look like diminutive, delicately fashioned deer. Silently they tiptoe about with a stilted gait that makes you think their long, slender legs are stiff-kneed and have no joints.

Actually, these creatures of the tropical jungles of Asia and Africa resemble camels and pigs in some respects, deer in others. They are the smallest of all the Asiatic hoofed mammals, approaching the hare in size. The males have tusklike upper canine teeth that project below the mouth like those of certain wild swine.

The chevrotains, or "mouse deer," as they are popularly known, are neither mice nor deer. They are sufficiently distinctive to justify their being placed in a family all by themselves—Tragulidae ("little he-goats").

Rather abundant in the regions they frequent, chevrotains are shy and wary, as you would expect of vegetarian animals that lack great strength, impenetrable hides, sharp claws, horns, or other effective means of defence. And their jungle enemies are numerous—snakes, lizards, and flesh-eating mammals.

The little chevrotain is a fair climber, frequently taking refuge in the lower branches of trees when attacked. Some say that when the chevrotain is pursued by hounds, it will jump up in the bushes and hang itself upon a branch by its hooked canine teeth until the danger is over.

This little animal may make its home four or five thousand feet up in the mountains, but it is most common in low

country. It lies up during the heat of the day, preferably in crevices among rocks and other sheltered places. It ventures out to feed only at dusk.

The chevrotain is often found frequenting jungle paths and along roadsides at night. Taken young, it is easily tamed and will not run off into the bush. It has been known to breed in captivity. The only sound it utters is a feeble bleat.

June and July are the months for the rutting season, when the males remain with the females; at all other times both sexes—except females with young—are solitary. Usually two offspring result from mating.

**The Spotted Chevrotain, or Indian Chevrotain, *Tragulus (Moschiola) memina*,** dwells in the forests of Ceylon and southern India north to the east-central provinces. This little beast is no more than a foot high at the shoulder, and its head and body length is twenty inches at most. It weighs about five or six pounds, and its tail is a mere stub of less than two inches. Its general body colour is light brown, with longish white or buff spots that merge in lengthwise bands along the sides.

There are also two Malayan types that are slightly larger than the Indian chevrotain; they are unspotted, with white under parts, chin, and throat. The **African Water Chevrotain, *Hyemoschus*,** is somewhat larger than the Asiatic species. It frequents the lakes and water courses of the Cameroons and the Congo. Being a good swimmer, it will take to water on the least provocation.

## Even-toed Hoofed Mammals: 4

### Deer

Although the deer are mostly animals of the wild, they have always been of the greatest importance to humankind. Their flesh, known as venison, may be a delicacy to us of the West, but to people in far-off places it means life itself. The deer's hide may serve many purposes, and its handsome antlers can be made into useful tools.

We find the deer in all sorts of regions. They are at home in lowland swamps, grassy plains, and sparsely covered brush country; they dwell in dense woodland, too, in mountainous terrain, and even in the snowbound wastes of the Arctic. Just as they live in many different places, so they come in many sizes, ranging in bulk from the dimensions of a spaniel to those of a large horse. In bygone days they were even bigger: the great Irish elk, which we know only from its remains, had antlers that stretched eleven feet from tip to tip.

One of the most remarkable features in the entire animal kingdom is the deer's antlers. Generally only the male has them. A few species, the musk deer and the Chinese river deer for example, lack antlers in both sexes.

The antlers are solid bony growths that develop from permanent bases on the frontal bones of the skull. The deer sheds them annually, usually in midwinter or early spring. About two weeks after the old antlers are dropped, a round furlike ball begins to rise from each base. Very rapidly these small growths swell and expand into the curving and branching structures that will soon grace the head. In this growing stage, the antlers are soft and spongy; their tissues are richly pro-

vided with circulating blood.

Growth continues until the supply of blood and nourishment slows down; finally it stops altogether as the blood vessels shrink and cease to function. The antlers now harden to a bonelike consistency, while the overlying "velvet" dries up and peels off. The animals burnish and polish the antlers by rubbing them against tree trunks and branches—a process doubtless prompted by the itching sensation caused by the drying up of living tissues.

This periodic loss and replacement is truly amazing; even the enormous antlers of the moose, which may weigh up to sixty pounds, fall off and reappear every year!

While antlers vary in size and shape, those of each species of deer have their typical pattern. Often magnificent as a headdress, the antlers are also formidable as weapons. Although they may be employed against other kinds of animals, more generally the male deer use them in battle for possession of the females.

In their courtship struggles, the males rush at each other with battering, headlong charges. However, the rivals are seldom fatally injured, as the tines, or points, form a basketwork guard that rules out most of the danger from direct piercing thrusts. Occasionally the antlers of two combatants become so firmly interlocked that the animals exhaust themselves in fruitless efforts to escape; in the end they starve to death.

Aside from their remarkable antlers, nearly all the deer are noteworthy for

## Musk Deer

another reason—they lack a gall bladder. Whether this deficiency is fortunate or not, we cannot say; we know nothing about gall-bladder disease among wild animals, though it is a serious ailment in human beings. Still another peculiarity of deer is that they have no central incisors in the upper jaw, their place being taken by a pad of hard gum tissue; this is typical in ruminants. Sharp, daggerlike upper canines are usually present in deer that lack antlers.

Deer, we have seen, are ruminants. When a deer browses, fresh food is partly masticated, then swallowed, and passed on to the lobe of the stomach known as the "paunch" (rumen). Here it remains to soften and soak. At its leisure, the animal can contract this paunch and return some of the food—now called the cud—to its

mouth. This time the cud is thoroughly chewed and swallowed again. Bypassing the paunch, it is digested in other parts of the stomach.

There are close to a hundred forms of deer. Probably many more remain to be discovered and identified in the more remote and as yet incompletely explored wildernesses of the world.

The deer family is known as the Cervidae. These even-toed ruminants are spread throughout the Northern Hemisphere, over Asia, Europe, and North America. In the southern half of the globe, their range is limited almost entirely to South America. With the exception of certain kinds of red deer that are found in the Barbary Coast area, this family is absent from Africa, and no native species exists in Madagascar or Australia.

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## Musk Deer and Muntjaks

**The Musk Deer**, *Moschus moschiferus*, the most primitive of the living deer, is a small creature that favours the wooded slopes at high altitudes in central Asia and at lower elevations in Siberia. We find it throughout the Himalayas as far west as Tibet and north into northern Siberia.

Usually a solitary animal, the musk deer sleeps during the day in a "form" like the hare. In the deep snows of eastern Siberia the author has seen this deer's runways and the forms where it slept. Though he often found its bed still warm, he never succeeded in glimpsing the animal before it stole silently away. The deer moves about to feed only from evening to early morning. A typical ruminant, it is a vegetarian, browsing on lichens, grasses, and foliage.

The musk which gives this deer its name is developed in an abdominal gland during the rutting season. A single animal produces about one ounce of musk. Many

of these deer are killed for the "musk pod", which has considerable commercial value.

The musk is used by the Chinese to make perfume. Only males over three years old are of any value. In North China, where the musk deer is plentiful and the musk pods bring a substantial annual income, the hunters are careful to kill only the grown males. This much-persecuted little deer often escapes its captors by climbing leaning trees and taking refuge in the thick tops.

The rutting season comes in January, and a single young is born in June; twins are rare. The fawns are ready to mate before they are a year old.

We have already described this animal as primitive. It has a gall bladder, lacks antlers. Its large ears, short tail, and thick, woolly coat emphasize its resemblance to a large hare. The upper canine teeth in the male are especially

long, frequently measuring two or three inches in length. The fur is lengthy, coarse, and brittle.

The musk deer is a pleasing animal to behold. Its coat is a rich dark brown, mottled or spotted with grey in the adult; the young are spotted with white. An average male stands twenty inches at the shoulder and two inches taller at the rump; the hind limbs are longer than the front limbs. The head and body measure about three feet, not counting the tiny stubby tail. The animal weighs twenty to twenty-five pounds.

Worthy of passing mention at this point is the **Chinese Water Deer**, *Hydropotes inermis*, a dweller in the reed beds and low brush country along the shores and islands of the Yangtze river in China, and in Korea. A small creature without antlers, it is much like the musk deer in appearance. It may give birth to five or six young at a time—whereas one or two fawns are the rule among other deer.

**The Muntjak, or Barking Deer**, *Muntiacus*, is also known as the **Jungle Sheep**, **Red Hog-Deer**, and **Rib-faced Deer**. A small animal, it is rather like the musk deer in size. However, it differs from other deer in a curious feature—the male has tusklike upper canine teeth. Timid and shy, this deer nevertheless makes good use of its long and well-developed canines in fighting off dogs and other natural enemies.

These canine teeth, one notes with interest, are not fixed firmly in the jaw; the muntjak is capable of moving them at will. Some observers believe that the peculiar rattling noise made by several animals together, while on the run, may be produced by the teeth.

Muntjak hunting is a popular sport in southern Asia, and this deer's flesh is considered excellent eating. The muntjak,

though a solitary creature, may be attracted in small numbers to one area by the presence of food. However, it keeps close to dense cover and is difficult to shoot.

Wintertime is the favoured season for hunting the muntjaks—the natives line one side of a bushy section, and dogs are turned in from the other side and drive the animals toward the hunters. The muntjaks will make a fast getaway, if the hunter is not alert. These deer carry the head and neck low when running, and have a rather ungainly gait.

The muntjak utters a sharp, doglike bark—whence the name “barking deer.” The call is often repeated, usually in the early morning or evening and sometimes after dark. The “bark”, very loud for an animal the size of the muntjak, is uttered as a mating call or as a cry of alarm.

The rutting season in northern India for these deer is in January or February. Six months later, a single fawn is born; sometimes there are twins. The young are spotted at birth and retain their spotted coats until the following year.

The muntjak's two-pronged antlers, five or six inches long, grow from the top of high column-like bases covered with hair. The male drops his horns in May, and the new set is fully grown in August. The muntjak has an exceptionally long, extendible tongue, and can lick the whole of its face with it.

This animal's general colour varies from chestnut to tawny or mahogany red. The average shoulder height is two feet at most, with a head and body length of three feet as the maximum.

## True Deer

**The Fallow Deer**, *Dama dama*, assembles in large herds in parks and open game reserves. In the wild, however, it is more



**Fallow Deer**  
A fairly common deer often found in Europe in semi-domesticated herds.

likely to roam in small parties and hide in thickets during the daytime. While it eats a considerable amount of grass, it also browses on shoots, leaves, shrubs, and the like.

Fallow deer are quick to make up their minds to move. When they are about to run, they shake their tails and then take off with a long, swinging trot. They can jump and scramble over a seven-foot fence. The animals are wary and hard to track.

Mating takes place about October and lasts one month. At this time you can hear the rutting cry of the fallow deer—deep-toned grunts or barks—a good two miles away. When they utter the cry, the neck is stretched out and the head, lower than normal, is jerked upward.

The fawn comes in June. Usually there is only one; twins are rare, and there are never more than two. The doe does not show much concern for her fawn—on being alarmed, she either takes the fawn with her or else hides it in a thicket and gallops off without a backward look. The

fawn gains the use of its legs much quicker than most other deer.

The fallow deer's antlers are broadly flattened, or palmate (stretched out like the fingers of the hand) at the tips. They are ornamented with several small tines. The colour of the typical animal is fawn dappled with whitish spots in summer, and uniformly greyish in winter; there are times when the entire animal is blackish brown. A large buck stands three feet at the shoulder and weighs about two hundred pounds.

The fallow deer started in the Mediterranean countries, but it has been introduced all over Europe. It is said to have been imported into Britain by the Romans, and the ancient Egyptians brought it to their own land.

**The Axis Deer, Spotted Deer, or Chital, *Axis axis***, is perhaps the most beautifully marked of all the family and is also one of the most graceful of all deer. Partial to surroundings of bushes and trees near water or in the bamboo jungles, it is a creature of the wild and beautiful scenery of the Indian plains and foothills; here, in a wonderland of rippling streams bordered by lofty trees, it wanders among open, grassy glades.

These spotted creatures love company. They associate in herds at all times of the year, and often several hundred are seen together. They favour daylight hours for their activities. Usually they go to drink between eight and ten o'clock in the morning, and sleep away the midday hours. Good swimmers, the animals readily take to water. Their mating call is a loud, hoarse, barking sound, easy to recognize but impossible to describe. They also have a shrill cry of alarm.

The axis deer is reddish brown in colour and profusely dappled with white spots which it keeps for life. It stands

about three feet at the shoulder and weighs two hundred pounds or so. The antlers—they may measure up to three feet in length—are supported on short bases. Usually they have only two tines on each side.

### The Sambar Deer, or Rusine Deer,

*Cervus (Rusa) unicolor*, the common deer of south-eastern Asia and also the largest, is a forest or woodland creature. It may come out on grassy slopes or open forest glades to feed, but it quickly takes refuge among the trees when danger threatens.

Sambar deer never associate in large herds. Two or three and sometimes half a dozen animals are seen together; stags as well as hinds are often found singly. Hunted on horseback, they maintain a steady but not swift pace, and can easily be overtaken by a good horse in open country.

Grass is the sambar's favourite food, but it also browses on shoots and leaves of trees and often travels long distances to drinking places. It does most of its feeding in the early morning and evening. During the day it lies up in the forest, where it chooses a spot well shaded from the sun's rays.

The sambar stag's mating call is a loud, somewhat metallic-sounding bellow. The hind's note is fainter and sharper. October and November are the months of the rutting season. A powerful stag usually appropriates two or three hinds, guarding them jealously from other stags until the mating season is over. Soon afterward, he drops his antlers (they are three-pointed like those of the hog deer).

Eight months after mating time, the hind retires to some secluded thicket in the forest and gives birth to a fawn. For her to have more than one young at a time is a rare occurrence. The young are without spots. In adults the hair is coarse

and uniformly dark smokey brown in colour.

We find a number of varieties of the sambar living in different places at elevations of from four thousand to fourteen thousand feet in southern Asia. They vary in size, the largest being the Indian Sambar, which is also found in Ceylon. It stands over five feet at the shoulders and weighs six hundred pounds; its horns measure forty-eight inches in length.

### The Sika, or Spotted Deer of East Asia,

*Cervus (sika) nippon*, is a relatively small deer, lightly spotted, and marked with a light rump patch. We find this handsome animal in Manchuria and along the eastern coast of Asia, as well as on the offshore islands from Formosa to Japan. Subspecies are numerous.

The sika's antlers, which usually have four tines, are in great demand in the



Sambar Deer

This deer is the largest and common species of South East Asia.

## Thamin

growing stage. The Chinese, who consider them more valuable for medicine than those of other deer, gladly pay high prices for them. Constant hunting has made the sika deer exceedingly shy.

Until a hundred years ago, some sika species were almost unknown to the West. Père David, an indefatigable naturalist of the last century, heard of a new kind of sika in China and undertook to obtain a specimen. At length his efforts were successful; but a mandarin who disliked foreigners had him arrested and confiscated the animal. In 1867 David's hunters secured a second sika, which was seized by Chinese officials and cut to pieces. However, the resourceful David salvaged the pieces and sent them to France. Scientists call this species *Cervus mandarinus* to commemorate the destructiveness of the Chinese officials.

The sika deer stands about three feet high at the shoulder and has a head and body length of about four feet, plus an eight-inch tail. Its chestnut summer coat is beautifully spotted with white; in winter, the colour changes to dull brown and the spots fade and almost disappear.

**Schomburgk's Deer** is native to the plains of Thailand and may occur in Yunnan, China. The antlers divide into nine or ten prongs, with the long, forked brow tine extending at right angles forward from the main beam. The body colour of this large deer is uniformly brown on the back and white beneath.

**The Thamin, or Eld's Deer**, *Cervus (Rucervus) eldi*, is a herd deer inhabiting grassy plains and swamps in groups of as many as fifty. They frequent the outskirts of the forest during the heat of the day; at other times they generally keep to more open country.

Known also as the **Panolia Deer** and

the **Brow-antlered Deer**, the thamin reaches forty-five inches at the shoulder and weighs about 240 pounds. The large antlers have long brow tines, with from two or three to ten points branching from the main beam. The adult wears a brown coat with no contrasting markings. The spotted young—there usually is but one—is born in the late autumn and reaches its prime when six or seven years old. The typical thamin is found in Burma and the Malay Peninsula.

**The Indian Swamp Deer, or Barasingha**, *Cervus (Rucervus) duvaucelli*, despite the first of its names, is not a denizen of marshlands. Instead, it favours open forests and grassy plains in northern India, where it gathers in large herds during the breeding season.

This animal is a proud-looking, massive creature. It stands four feet at the shoulder and weighs up to 560 pounds. Its handsome antlers, sometimes more than three feet long, bear from ten to sixteen points. In summer it sports a light reddish coat, more or less spotted with white; in winter-time the colour changes to yellowish brown.

**The Red Deer**, *Cervus elaphus*, though it lacks the handsomely spotted coat of the axis deer, is considered by naturalists to be among the finest of the deer family. A larger animal, it is sleek, clean-cut, and well proportioned in build. Alert and lordly in bearing, it moves with striking grace. Its appearance is enhanced by an imposing crown of branched antlers.

We find the red deer in many parts of the World: in Europe, Asia, and North Africa. Its coat is reddish brown in summer, taking on a greyish tinge in winter. A large pale-buff patch marks the rump and extends along the sides of the tail. The full-grown stag stands, about four

feet at the shoulder and weighs three hundred pounds or more.

In its prime, the stag normally carries six tines on each beam of the antlers—some, in fact, have been found with a far greater number of points. About one in every hundred stags never develops horns; we call such an animal a "hummel" or a "notts." Stags with only a brow tine and one terminal point are known as "switch-horns." Adult stags lose their antlers by March, but a new growth starts almost at once. By autumn, the replacements are fully formed and ready for use in combat.

As we have seen, an average red deer stag in his prime will carry six tines on each beam. The lowest tine over a deer's forehead is called the "brow" tine; the second tine is the "bez," the third the "trez," and the three remaining tines at the top forming a cup are the "sur-royals." A stag with six tines on each antler is a "Royal Hart," with a total of fourteen points or more it is a "Wilson" or "Imperial."

The red deer is a herd animal, but the males and females live apart except during the brief rutting season. The hinds and their offspring form closely knit groups—here we see the workings of the maternal instinct—and are not given to wandering like the males.

Shortly before the breeding season, which opens about September, the stags gather in large, rather loosely organized bands. Playfully they cavort about as they engage in seemingly good-natured fun and mock battles.

Sometimes the whole band will romp as a unit. But once rutting begins, the swollen-necked stags struggle savagely for possession of as many hinds as they can gather. It is only during the mating season, and after, that the males utter their defiant roars of jealousy and anger.

Usually stags do not range over more than a mile or so of their domain, but during the search for females they rut at a pace of six miles an hour and cover ten to twenty miles in a day. Once rutting is over, the bands settle down to another year of peaceful association.

You may often see the stag pictured as "monarch of the glen." But this is far from the truth—he is not even the leader of the herd. A mature female, old in years but young enough to have her annual calf, is at the head of the band. Her followers are usually her own offspring and the descendants of her calves. When the leader hind stops breeding regularly, she soon loses her authority over the herd.

The hind has a sharp staccato bark, which is a danger signal sounded only by the herd leader. Upon hearing it, the band immediately halts all activity, standing silent and alert. This watchfulness lasts until the matriarch resumes normal behaviour, signifying that the danger is past. The moment she moves, the entire assemblage quietly follows.

Once a year, it is true, a stag rounds up each herd of hinds during the rut. But this herd male is merely a temporary policeman who drives away any presumptuous and over ambitious rivals for his harem.

Among red deer, the hind gives birth to her young about eight months after mating. The white-spotted offspring, usually a single fawn—rarely twins—is born in the spring.

Although the baby is able to stand and move immediately after birth, it remains in the bush, where the affectionate mother has concealed it. The hind never wanders very far off from her fawn but returns from time to time to nurse it.

The red deer group consists of many species, subspecies, and varieties that differ according to where they live—the

## American Wapiti

British Isles, continental Europe, Asia Minor, Asia proper, and the Mediterranean region of North Africa.

The comely appearance and gentle nature of these beasts make them general favorites among the great parks and forest preserves of the Old World. The Eastern species tend to have a greyer coat than the European types, with large amounts of black on the shoulders, thighs, and under parts. Two varieties worthy of passing mention are the **Maral Stag** of the Caspian region and the **Hangul Stag** of the Kashmir valley.

The maral stag (or Persian red deer) is larger than its European cousin, standing four and a half feet at the shoulder and weighing 560 pounds. As for the hangul, it is often erroneously called the barasingha, a name which properly belongs to the Indian swamp deer. The hangul measures over four feet at the shoulder and weighs 450 pounds. It is a magnificent beast with branching antlers—like those of the European red deer—that may reach a length of fifty inches.

**The American Wapiti**, *Cervus canadensis*, better known in the United States as the **Elk** ("wapiti" is the name the Shawnee Indians gave it), is the largest of the round-antlered deer. The name elk is somewhat confusing for this is the popular name given, in Europe, to the moose! With the exception of the moose, the wapiti is the biggest deer alive in the world today. A full-grown wapiti stands five feet four inches at the shoulder and weighs from seven hundred to one thousand pounds. The antlers of the adult bull may have as much as a five-foot spread.

The wapiti haunts the tall mountain timber. The sound of the clear "bugle call" by the bull at the beginning of the rutting season in the autumn is a challenge to battle with any other male in the neigh-

bourhood. Starting in a low, stirring key and rising to a high pitch, it drops abruptly into a harsh scream, followed by a few grunts. An aggressive contender usually answers with a loud, defiant bark and the struggle is on.

In combat the bulls, with their necks swollen and their nostrils distended, rush full tilt and crash into each other, their horns rattling like swords. Occasionally a bull gets his neck broken by the force of the terrific impact. More often, however, one or the other realizes his inferiority after two or three battering passes. Accepting defeat, he gallops away.

Though a powerful bull may number fifty or sixty cows in his harem, a dozen females is the usual retinue. The point is that while an especially powerful stag may collect a large harem of cows for himself, he can rarely keep it very long. Several unmated bachelor stags usually manage to outmanoeuvre him. At first, to be sure, he is too cautious to be enticed into an all-out brawl by covetous stags; but eventually the taunts of one aspiring competitor will draw the head stag into a fast and furious battle. While he is thus engaged, other stags move in from different directions, split up the herd of cows in small groups, and quickly take them off to the hills. The old stag may win his battle, but his harem is gone and he is too exhausted to follow.

Were it not for such strategems, the polygamous practices of the herd bull would leave a large number of stags unmated. Their natural instincts would have to go unsatisfied because of the ceaseless vigilance and physical superiority of the master of the harem.

The young elk arrives in May or June, it is usually born in open grassland. Within an hour, at most, after birth, the calf (generally there is only one) is not only able to stand—it can even walk on its

wobbly legs! At first its coat is light tawny-brown with large white spots, an effectively inconspicuous pattern among the patches of brilliant light and deep shadow of the woodlands.

A few days after birth, the calf is strong enough to follow the main herd toward the summer range. The mother nurses her baby for the first six weeks, but after that it learns to browse on leaves and twigs. By August, the spots have faded, and late autumn finds the calves completely weaned. The animals average a life span of fifteen or sixteen years—in exceptional instances, twenty-two years.

Throughout the summer, herds of elk live high up in the mountains, where they are free from attack by mosquitoes and other insect pests. When autumn comes, they descend to lower altitudes, spending the winter in the sheltered valleys and meadows.

Originally the wapiti ranged over most

of the United States and southern Canada. Today we find it only in the Rocky Mountain region and the Far West. The closely related wapiti of central and eastern Asia are now included with the red deer groups.

As for the American wapiti, its general body colour is pale fawn, but the head and the maned neck are dark chestnut-brown. The large rump patch and short tail are straw-coloured. The tremendous antlers have more than five well-developed tines in the adult.

**Père David's Deer, or Milu, *Elaphurus davidianus*,** is a strange animal to the Chinese way of thinking. They call it *Ssu-ou-hsiang*, "the four unlikes." As they put it, this deer has the tail of an ass, the hoofs of a cow, the neck of a camel, and the antlers of a stag!

The antlers of Père David's deer are peculiar in that the front branch comes off fairly high above the base and is usually forked once and sometimes twice. The hind prong is long, slender, and straight, often with small branches at the extremity.

But what is much more remarkable about these antlers is that we have some evidence to indicate that fully adult Père David's deer may actually grow two sets of antlers within a single year—a summer set and a winter set. Up until they reach maturity, the stags have only one set. When they have two, the antlers are smaller.

Mature stags shed their summer antlers immediately after the rut, at the beginning of November but sometimes as early as September. The shedding of the winter antlers varies a great deal among individuals. Still, no matter how late the animal drops its winter antlers, the new set, even if only partly grown, will harden in time for the mating season in the



**Père David's Deer**

**A deer never discovered by naturalists in its wild state.**

## White-tailed Deer

autumn.

This peculiar trait may be a hangover from past generations when these deer possibly bred twice a year—a new development in the deer family or merely a sport of nature. It is noteworthy that older stags, with their small antlers, cannot compete with the younger animals, whose single set is larger.

Today this extremely rare deer is being bred only in a few private parks and zoological gardens. Naturalists believe that the animal originally dwelled in the swampy, reed-covered plains that once existed over the greater part of north-eastern China. However, they have never succeeded in discovering it in the wild.

Père David's deer is large—three feet, nine inches at the shoulder—with a bushy tail longer than that of other deer. Its moderately small ears are well haired on the inside. The winter coat is full greyish buff, and the young are spotted with white as are most deer fawns.

## Hollow-toothed Deer

**The White-tailed Deer, or Virginia Deer, *Odocoileus virginianus*,** is a creature of the American woodlands. However, instead of frequenting deep, unbroken forest, it chooses to live where dense woods and thickets alternate with open meadow and sunny forest glades. A shy, secretive animal, it never gathers in groups of more than two or three.

At the approach of danger, the white-tailed deer will silently steal away, with head lowered and "white flag" (the tail) held down tight. The moment the deer starts to run, it throws caution to the winds and carries its tail aloft, waving from side to side—an unmistakable sign of warning for its fellows.

The white-tailed deer is not much of a migrant, and it prefers its own company

to that of a herd. About three hundred acres is the extent of this more or less solitary animal's home territory.

The white-tailed deer and the rattlesnake are confirmed enemies. Many a mortal combat has taken place between the buzzing reptile and the antlered monarch.

A battle between a snake and a deer is a dramatic spectacle. With head lowered and held sideways for better vision, the buck warily approaches its foe and receives the lunging strike of the snake on its horns. In a flash, the deer springs into the air and lands with all four sharp hooped feet on the rattler, instantly bounding off to repeat the action. After a few such onslaughts, the snake is literally cut to ribbons. Though she lacks antlers, the doe attacks in much the same fashion as the buck.

The bucks start courting the does in October, and the mating season lasts until December. There are fierce fights between the bucks for possession of the does.

The spotted fawns are usually born in May and weigh about four pounds apiece. The number of young to each doe varies according to the mother's age. Her first-born is single; the second year she may have twins and sometimes triplets. Occasionally there are four—though this is rare for any deer.

The white-tailed deer has a life expectancy of fifteen to twenty years, and a doe may have as many as thirty-one fawns during the first fourteen years of her life.

Though most abundant in the north-eastern United States, the white-tailed deer ranges over the whole width of North America from southern Canada through Mexico, and down into South America as far as Peru and Bolivia.

This deer is rather small and graceful. It is also known as the "fan-tailed deer," and its long, bushy tail is conspicuously

## Sitka Deer

white on the underside. The back, sides, and limbs of the summer coat are uniformly tawny in colour, while the heavier winter dress is more sombre and greyish in tone. In both coats the undersides and throat are white.

We find a great deal of difference among the more than a dozen kinds of white-tailed deer, not to mention the numerous local varieties. The more northern of these are among the largest and may reach sixty-six inches in head and body length, with a shoulder height of forty-six inches. The full-grown buck ranges from two hundred to four hundred pounds in weight.

By way of contrast there is the **Dwarf White-tailed Deer**, measuring only fifty inches from its nose to the root of its tail and weighing less than fifty pounds. The main beam of the antlers in all the white-tailed deer curves forward and the tip inward, giving off two or more erect, unbranched tines.

**The Mule Deer**, *Odocoileus hemionus*, is a sociable creature. It follows regular migration routes, spending the warm summer months in the mountains and moving to the sheltered valleys and lower levels in the autumn. During such seasonal movements, the combined herds on the trails may number several hundred animals.

Since the mating season is in the late autumn, the fawns are born on the way back to the summer range. The does have their babies—usually twins—six or seven months after mating. There is one instance of a marked doe that gave birth to twins for twenty successive years before becoming barren.

The mule deer has large ears—hence its name. Its appearance is quite different from the white-tailed deer's in this way, and in many others.

The mule deer has a large whitish

rump patch, but the tip of the rather short tail is black. The antlers rise vertically from the head and are evenly divided at the first fork; each tine again divides to produce four or more evenly spaced spikes on each antler.

In summer this animal's coat is tawny or yellowish brown in colour; in winter, it is much longer and greyer. An adult buck may stand forty-two inches at the shoulder and measure about sixty inches in length not including the eight-inch tail. Its weight runs from 150 to 200 pounds.

There are about a dozen kinds of mule deer, each specializing in its own area, which may be rather large. Occasionally these territories overlap to some extent.

The domain of the mule deer is western North America, from northern Mexico to central British Columbia, and from Colorado in the East to California in the West. The extremes in range are represented by the Southern Mule Deer, an animal that roams Baja California, and the **Sitka Deer**, found on coastal ranges and islands from north of Juneau, Alaska, to central British Columbia.



Mule Deer

## Brocket

The **Columbia Black-tailed Deer**, of the Pacific coast, is still another well-known type.

The black-tail, like other mule deer, does not lack courage and will sell its life dearly. The skeletons of a large buck black-tail and a full-grown mountain lion were once found lying side by side in a hemlock grove in Oregon. There was evidence of a violent struggle. A round hole in the top of the mountain lion's skull had apparently been made by a prong of the deer's antlers—proof that though the deer had lost its fight for freedom, it had mortally wounded the lion in the conflict.

The Columbia black-tailed deer has a longer range than the Sitka deer—it occupies a narrow strip along the Pacific coast from central British Columbia to California. Nowhere does the black-tail range inland beyond the Sierra Nevadas and the Cascade Mountains. It is easy to recognize the Columbia black-tail and the Sitka deer by the rather long tail, black on the upper surface, and by the forked antlers, which have two main tines of equal size.

**The Brocket, or Cariacu, Mazama**, may be found all the way from Veracruz, Mexico, through Central America, and into South America. It has short, unbranched spike antlers about half as long as the head. All members of the brocket group are small, stocky deer—the average shoulder height is about two feet. The Pygmy Brocket of central Brazil ranks among the smallest of all true deer, standing less than nineteen inches at the shoulder. The body colour of these animals is basically brown.

Brockets are at home in the dense thickets of unbroken forests from sea level to altitudes of sixteen thousand feet. Like other deer, they are browsing animals and feed on leaves, twigs, and green shoots of

trees or bushes.

Alert, shy, and retiring, brockets are most active during the early hours of the morning and late evening. Among the hosts of hungry predators ready to devour these timid beasts, big snakes and large cats take the greatest toll.

Brockets are not sociable creatures. They do not gather in herds; instead, a male and female usually join company. The average number of young for an adult doe is two. At birth the fawns are spotted with white. They are able to stand shortly after they come into the world, and in several days they are ready to accompany their parents.

There are at least seven recognized kinds of brockets, with a good many varying types among them. The best known is the Red Brocket of Central America.

**The Andean Deer, Huemul, or Taruga, Hippocamelus**, is a lover of the heights. The Peruvian Huemul is at home in the Andes at elevations of about three miles in Peru. Its relative the Chilean Huemul remains below the timber line of a range that extends through Chile and western Argentina nearly to the Strait of Magellan. Both have a very odd trait that does them a marked disservice.

For some unexplained reason, huemuls appear to be unconcerned about their safety. Observers have testified on more than one occasion to the unusual lack of wariness on the part of these deer.

Thus, one reliable informant states that he walked in full view to within rifle distance of four huemuls, singled out the largest, then fired and missed. A second shot dropped one, but the other three did not run off—they merely stood as if amazed or slowly walked about in a curious, stiff goose-step manner. Meanwhile, a herd of guanacos that was on the same hillside had quickly disappeared

over the top of the mountain at the first rifle crack.

Smaller in size than the typical white-tailed deer, the Andean deer has a shoulder height of thirty-nine inches. Its total length, including the five-inch tail, is sixty-six inches. Males carry heavy antlers, about ten inches long, consisting of one simple fork and two points on each side. The hair is rather coarse and thick in texture and brownish or yellowish brown in colour.

**The Marsh Deer, or Suasupucu,** *Blastocerus dichotomus*, is the largest and handsomest deer in South America. A swamp-loving animal that ranges from Brazil to the forested country of Argentina, the marsh deer is about the size of a red deer. Its antlers may exceed twenty inches in length and fork into two equal branches that subdivide, forming ten points in all. The animal's general colour is reddish chestnut in summer and browner in winter.

**The Pampas Deer, Pudu,** a relative of the marsh deer, lives on the pampas and prairies from Brazil to northern Patagonia. The **Chilean Pudu**, the smallest American deer, has a shoulder height of about thirteen inches, and weighs twenty-four pounds at most. It takes readily to salt water and crosses over to Chiloe Island off the Chilean coast. The gentle fawns are easily tamed.

## Moose

**The Moose, Alces**, known in Europe as the **Elk**, is the largest living member of the deer family. Towering above the other animals of the northern latitudes, an average full-grown bull stands just under six feet at the shoulder and weighs between a thousand and fourteen hundred pounds.

Exceptionally large moose antlers have been known to weigh sixty pounds.

There are some odd shapes and forms in the mammal world, and the moose, homely, cumbrous, and uncouth, has one of them. The shoulders are higher than the rump. The legs seem much too long for the humpbacked body, and they are certainly too long for the short neck. In fact, a moose cannot reach down after short grass unless it kneels; in order to drink, it must wade into the water.

However, the long legs are useful to the moose in several ways. They enable the animal to reach high up to browse on twigs and leaves of willow trees, and to go into deep water to feed on water lilies—one of its favourite summer foods. At times, when feeding, a moose will wade into water so deep that it will become completely submerged. Finally, the long legs of the moose are well adapted for travel through the tangled masses of fallen timber that would prove an impassable barrier to an animal with shorter limbs.

Bulls have huge antlers, flattened and bearing numerous points, that may extend sideways from fifty to more than seventy inches. The tail of the moose is a mere stump; the ears are large. The animal has a long head, with a bulbous nose and an ample, pendulous upper lip. Its coat is long, coarse, and blackish brown in colour, with greyish tones on the face, belly, and lower limbs. A growth of skin and long hair, known as the "bell," hangs from the animal's throat.

A solitary animal, the moose generally sticks to one mate. The rutting season occurs in the autumn, and the bulls fight terrific battles for possession of the cows. The effects of these mighty duels are visible in the forest for some time—trees are badly scarred, the ground is torn up.

The rut begins in September and lasts

## Alaskan Moose

until the beginning of October. The calf comes into the world eight months later—in May or thereabouts. The cow moose usually has one baby the first season, but two are not unusual. On rare occasions three are born. Unlike many deer, the moose calf is not spotted or striped with white but resembles the mother in its nearly uniform coloration. How long the moose lives in the wild we cannot say for sure; in captivity it does not survive for longer than a year or two.

There are three or four varieties of North American moose which are distributed from the Rocky Mountain region to Maine and north through Canada and Alaska. The largest and most powerful of these is the **Alaskan Moose**, which may attain a shoulder height of eighty-one to ninety-six inches and a maximum weight of eighteen hundred pounds.

There are also three kinds of Old World moose. We find the typical European animal in the Scandinavian peninsula and Germany; the typical Siberian and Manchurian forms have an extensive Asiatic range. The antlers of the Old World animals are somewhat flattened; none can even approach the enormous spread of those of the Alaskan moose.

## Reindeer

Reindeer are far-famed creatures today. Their popularity, however, does not seem to go much further back than a poem which begins with the words "Twas the night before Christmas," and introduces the fleet-footed companions of Saint Nicholas—Cupid, Vixen, Comet, and the rest. Ever since Clement Moore wrote these verses in the last century, the reindeer of the far-off North have seemed near and dear to us.

These big beasts are not always so good-humoured as is commonly supposed.



**Alaskan Moose**

**A prize specimen of this, the largest deer.**

During the mating season, reindeer are in a fighting mood and extremely dangerous—the air resounds with the crash of their antlers. Many a man has been killed at this season of the year, when the bulls, or stags, battle for supremacy over the harem.

Reindeer have been called the "Camels of the Frozen North." With the exception of the musk ox, they live farther north than any other hoofed animal; they range beyond the timber line into the Arctic Circle in both the New World and the Old World.

In the wild state, these animals are known as caribou. Today we find caribou chiefly in the New World, where there are Barren Ground Caribou, Woodland Caribou, and Mountain Caribou. There is also an Old World Caribou, known as the reindeer in its domesticated form. (The word "reindeer" appears originally to have meant an "animal that pastures.") Reindeer have been introduced into the New World, and have proved of the greatest value to the Eskimos as a source of food and clothing.

**The Caribou, Rangifer**, is the only deer in which we find both sexes with antlers.

## Barren-ground Caribou

Even the fawns have small spike antlers which appear two months after birth.

The antlers themselves are unique and picturesque. The main beams sweep gracefully back and upward from the head, spreading as they rise, then bend forward and end in a flattened palm.

The shape and number of tines vary quite a bit. The brow tine usually develops only on one antler and extends down over the face in a broad vertical palm or "shovel." It is generally supposed that the "shovel" is used to dig down through the snow to the underlying moss, on which the animal often feeds. Still, the caribou has more success digging with its feet. The bulls drop their antlers in the early winter; the does carry them until May.

The caribou is the most sociable, as well as the most migratory, of all deer. Some of the more northern groups begin to collect in August for the movement south. During the exodus from the open tundra to the shelter of the timber, some may travel several hundred miles. Often the migrating herds number thousands of animals.

When they are travelling, caribou produce a noticeable snapping or clicking sound. This is made by the ankle joints—not, as one might suppose, by the clacking, wide-spreading hoofs. The caribou has a fast-swinging trot that it can keep up almost indefinitely. An excellent swimmer too, it can only be overtaken in the water by a first-rate canoe-man.

**The Barren-ground Caribou**, *Rangifer arcticus*, takes its name from the Barren Grounds or Barren Lands of northern Canada, where it dwells. It is very much at home on the tundras of Alaska, too. Indeed, there, the caribou are the commonest of big game. Although fairly well protected, the animals seem to be moving further north in their search for safety.

Usually the antlers of the Barren Ground caribou are very long and slender, and with several points projecting from the flattened tips. Here are some features they have in common with other caribou. The cloven hoofs are usually broad and wide-spreading, and attached to them are dewclaws—small vestiges of hoofs (sometimes called "false hoofs") that are of some value on snow-covered terrain. The nose is covered with hair—an excellent protection against extreme cold.

Caribou are usually brown, paler and greyer on the back and darker on the legs and head. The neck and the throat mane are white or whitish. There is considerable variation in height among these beasts—they stand anywhere from forty to sixty inches at the shoulder. The disparity in weight is even more striking; some weigh as little as two hundred pounds, others as much as seven hundred.

Rutting time for the Barren Ground caribou is in September and October, at the height of migration. The big-eyed, dappled fawns are born on the Arctic tundra during the seemingly endless "day" of June when every bank is a bed of gay spring flowers.

We have seen how abundant caribou once were, and have noted that they are nearly extinct in the United States. It is no exaggeration to say that the animal owes its continued existence today to the remoteness of its homeland. The caribou's habit of travelling in the open and its rather poor eyesight make it an easy prey for the hunter and the wolf.

There are several varieties of Barren Ground caribou, including the **Greenland Caribou**. A small, light-coloured beast with slender antlers, it represents food, clothing, and shelter for many hardy people that live in desolate, frozen Greenland. The **Dwarf Caribou** of Queen Charlotte Island is a midget, compara-

## Reindeer

tively speaking, as it stands no more than thirty-three inches high at the shoulder.

**The Woodland Caribou**, *Rangifer caribou*, is darker and more heavily built than the Barren Ground caribou. The antlers, though less spreading, are stouter and more flattened. These deer are found through the forests from the extreme north-eastern tip of the United States to Great Slave Lake in Canada and Newfoundland. Related animals dwell in the Canadian Rockies and the Pacific coast region.

**The Reindeer**, *Rangifer tarandus*, and its relatives, once roamed widely from the Scandinavian peninsula eastward across Europe and through Siberia. Today they have almost disappeared in the wild everywhere but in the Siberian part of their ancient domain. However, these animals are still common in domesticated herds.

Wild or domesticated, reindeer or caribou have had an amazingly long association with man. It was the "Reindeer Age" that marked the dawn of human history.

In that period—it was twenty-five thousand to thirty thousand years ago—there were made, on cave walls, the first pictures that have come down to us. The artists, the "Reindeer Men" of the late Old Stone Age, left wonderful likenesses of contemporary animals—birds, snakes, horses, elephants, bears, bison, ibex, and oxen. But the best pictures of all were those of the reindeer—the most numerous big game in Europe and the principal support of man in that age.

Just when was the reindeer first domesticated? There has been a great deal of dispute on the subject, but our earliest reference to a domesticated reindeer seems to be from a Chinese source dated

A.D. 499.

It would appear that domestication was very tardy, if we are to judge from the fact that neither the Eskimo nor the Indian made any attempt to tame this animal, which was so common in northern America. Domesticated reindeer, to be sure, have for a long time played an important part in the lives of the Tungus and Chukchi tribes in eastern Siberia. The animal is bred for riding, harnessed to sleds, and used for food. The Lapps and their Scandinavian neighbours milk their reindeer, churn butter, and make cheese from it.

Domesticated reindeer did not make their appearance in America until 1892, when 162 Siberian animals were landed at Teller, Alaska, for the benefit of hungry Indians and Eskimos. During the following decade, 1,118 more Siberian reindeer were transported to the shore of St. Clarence Bay. Well over a hundred thousand of the descendants of these imported animals have been killed for food and clothing.

Norway, Sweden, and Finland are reindeer countries, and the Lapps, who live in the northern regions of those lands, are staunch admirers of the great antlered creatures. Their philosophy is that the reindeer is more important than they are—the animals can survive without them, but they cannot survive without the reindeer.

The Lapps do not drive their deer, like other herdsmen. Nomads, they follow the herds from the summer feeding grounds to the winter ones, and draw their living from the beasts.

The reindeer is food, clothing, and transportation to these folk of the Far North. The hair is used by the Lapps to stuff mattresses; the hides are made into parkas, trousers, and shoes; the sinew is used for thread; and the stomach membranes come in handy as food containers and for packing cheese made from rein-



Water Buck



Impala



Greater Kudu



Pronghorn

## Roe Deer

deer milk.

### Roe Deer

**The Roe Deer**, *Capreolus*, is one of the smartest looking of the smaller deer of Europe and Asia. A pert, compact, and sturdy animal, its fleet figure may be glimpsed flashing through forest glades, especially in the mountains.

This alert woodlands creature is an excellent high-jumper; it is particularly graceful as it springs over tall ferns and heather. On even ground it swings along with an easy canter, head held high. When pursued, it often pauses to listen and look back, and is loth to leave cover. It can climb rocky cliffs with the agility of a chamois.

Though they are not sociable by nature, several roe deer may occupy a small area of woodland; it is not unusual for groups of three or four to feed together. During the autumn these animals tend to migrate from one feeding ground to another, and in Manchuria from three hundred to five hundred roe deer have been seen on the march together.

Perhaps it is some obscure and half-forgotten mating ritual, or just pure playfulness, that impels roe deer to gather

in certain localities, where they gambol round and round after each other, wearing a circular track on the forest floor.

The doe brings forth her young in June, some forty weeks after mating. The fawns, usually twins, are marked with three rows of white spots on their tawny coats. The doe is very affectionate toward her babies and cannot stay far away when they are in danger. She is always on the lookout to protect her fawns or lead them to safety when enemies such as the fox or the golden eagle appear.

Roe deer stand from twenty-six to thirty-four inches at the shoulder and weigh about sixty pounds. Their horns are small (thirteen to sixteen inches long) and they rise abruptly together from the top of the head. The beam is very rough at the base, branching into a short forward prong and a longer rear tine that is forked at the tip.

Thick, harsh hair, brownish yellow in summer but duller brown in winter, covers the animal's body, while a bright white patch sets off the rump and stubby tail. The roe deer has a loud, sharp bark, something like that of a collie dog.

We meet the roe deer throughout Europe and across to the Pacific coast of northern Asia.

### Caribou

Photographed from the air, this herd is shown migrating southward in the North-western Territories of Canada.



## Even-toed Hoofed Mammals: 5

# The Giraffe Family

One of the most amazing sights to be seen on the African veld is a herd of giraffes moving at full gallop along the skyline. They travel with marvellous grace of form and rhythm of action.

Next to the trees the giraffes are the tallest living things on earth. Some of these beautiful, slender creatures are over nineteen feet high, and eighteen feet is not exceptional at all. The giraffe's shoulder height of twelve feet is rarely surpassed even by an elephant; and a man can actually stand upright between a giraffe's front legs.

In open country this animal can speed along at thirty-two miles an hour. But even when it comes to the bush, the tall giraffe is at no disadvantage—it does not need to slacken its speed. Instead, it swings along, swaying its head and long neck under the branches and in between the trees, without any danger of a crash.

Perhaps one of the reasons why the giraffe swings along so gracefully is that when travelling it usually paces like a camel; the legs on the same side of the body move simultaneously. This produces an even, swaying motion akin to the roll of a ship riding the waves. Of course, the giraffe also walks, trots, and canters, as well as gallops.

Another trait that the giraffe has in common with the camel is that it does not show to advantage in the water. It is a poor wader, and is unable to swim. A deep river is an impassable barrier as far as the giraffe is concerned.

Dry, arid country, where the ground is packed firm and hard, is essential for the giraffe. In deep mud and swampy

country it will bog down and become hopelessly mired. Even though its hoofs may measure twelve inches in length, they cannot support the huge, tall body on anything but solid ground.

There are two very distinct types of giraffes. The common species found over most of Africa south of the Sahara is generally referred to as the **Blotched Giraffe**, *Giraffa camelopardalis*. There are eleven named local variations of the common giraffe. The **Reticulated or Natted Giraffe**, *Giraffa reticulata*, is the other, and more handsome, variety; we find it in East Africa. This creature has large, four-sided, liver-coloured spots separated by a sharply defined network of narrow white lines.

Apart from being the tallest animal in the world, the giraffe comes close to being the third biggest land animal in bulk, competing with the rhino for this honour. A large bull giraffe weighs two tons. A cow is two or three feet shorter than her mate, and is lighter in weight.

Almost as remarkable as the length of the giraffe's neck is the fact that it has no more bones in its neck than does a horse or a cow. The length of the neck is due entirely to the elongation of the bones—not to any extra vertebrae. The shoulders of a giraffe are of course much higher than the hindquarters.

Both male and female giraffes have horns—quite short ones, covered with skin and hair, and tufted with black at the tip. Some giraffes of the northern species have a third horn, between the eyes, in front of the usual pair on the forehead. Not only that—old bulls often have

a rudimentary second pair, in the form of low bosses, at the back of the first pair.

The giraffe's large, dark-brown eyes, shaded by long black lashes, have a soulful, appealing expression. The giraffe has the keenest sight of any game animal in Africa; naturally its height allows it to command an extensive view.

A giraffe's lips are long, hairy, and prehensile. The long, extendible tongue measures up to eighteen inches in the adult. The neck is maned with short hair, while the comparatively long tail has a tuft of hair at the tip.

Though the giraffe is a sociable creature, the herds are never large. Rarely do we find more than ten or fifteen giraffes together. These herds are cows with their calves and usually only one full-grown bull. Bulls that do not have a harem live alone or go about in twos or threes.

A dangerous foe if put to the test, the giraffe can strike a smashing blow with its head, or deliver a terrific kick with its fore and hind feet. The customary attack is with the head.

In a duel between two bulls, each animal strikes for the chest and neck. Occasionally one giraffe will miss its mark and hit the ground with a resounding thud. However, these thumping combats rarely have a fatal ending. True, a really well-placed blow from a hundred-pound head could conceivably break the opponent's neck. Giraffes have been seen with dislocated neckbones, and dead bulls have been found with a broken neck—probably the result of these battles.

A giraffe's horns are hardly serious weapons. Rounded and padded at the tip, they do not penetrate. Aside from relying on head blows, the giraffe makes good use of its forefeet when fighting ordinary foes. We have spoken of its "terrific kick"—remember that it is backed up by well over a ton of bone and muscle.

The giraffe is fond of dry and open brush country; deep forest and swampy land are equally distasteful to this creature. Trees are more or less essential for its livelihood, since it cannot graze on the ground, except with difficulty. Leaves and shoots of the acacia, the most common tree of the African veld, are this animal's favourite food. And it is important to remember that against a background of acacia trees the markings on a giraffe resemble blotches of shadow and light—ideal camouflage for this tall animal.

The giraffe can do without water for quite a while—several weeks, even a month. Its ability to get moisture from leaves explains why it is sometimes found in the driest country, miles from water. Where water is readily available, it drinks regularly.

Even such a simple matter as sleeping becomes quite a problem for an animal with the giraffe's height. Some grown giraffes (like some elephants) rarely lie down; they prefer to sleep standing up. They have found that all the bother of lying down and getting up again simply involves too much effort. This custom is not always strictly followed; in some regions, giraffes habitually lie down to sleep.

Giraffes seem to have no fixed mating season. The newborn calf, which arrives fourteen or fifteen months after the mating, is a mere five and a half feet high. An ungainly little creature, it is all neck and legs.

Somewhat wobbly at first, a baby giraffe can stand and move around under its own power twenty minutes after birth, and is ready for its first meal. While nursing during the early stages, the calf braces itself between the mother's forelegs. For the first nine months, the calf is dependent on its mother's milk. After this it is tall enough to reach the branches of the

## Okapi

acacia tree and feed itself.

**The Okapi**, *Okapia johnstoni*. In natural history books published before 1900 there is no mention of the okapi—the animal did not become known to the white man until that date.

Many years ago pygmies living in the dense forest of the Congo told of a strange, elusive creature inhabiting their country. They described it as being built like a giraffe, striped like a zebra, and with large ears like a donkey. Hunters and explorers who visited these remote jungles, where tangled vines and dense forest growth blot out the sun for miles and miles, could never even get a glimpse of these seemingly mythical creatures.

Finally, the little brown people produced a skin of the animal. Here was tangible proof that what they had been speaking of was no phantom of the imagination. The white man's curiosity was now thoroughly aroused and his reputation as a scientist was at stake. What would the animal prove to be?—some kind of a horse, was the first guess; or perhaps an antelope.

• But the suppositions were all wrong. The animal turned out to be more closely related to the giraffe than to any other living animal.

For years, as we have seen, this strange mule-like animal was known only to the forest pygmies of Africa. The first rumours of its existence that were to receive serious attention came to the famous journalist and explorer Henry M. Stanley. He passed on the story to Sir Harry Johnston, at that time governor of Uganda. In 1899 Johnston obtained a few scraps of skin of the mysterious animal from the natives. He sent on the evidence to Dr. P. L. Sclater in London, who conjectured that they might belong to a hitherto unknown variety of zebra.



### Okapi

**Although a relative of the giraffe, the okapi was unknown to naturalists until comparatively recently.**

Two years later Johnston secured a complete skin and two skulls of this legendary creature. The discovery created a furore among zoologists throughout the world. Dr. Sclater named the animal *Okapia johnstoni*, in honour of the governor.

The okapi lives in deep forest country, yet its vision is not very well suited for the dim light that filters through the dense vegetation of its favoured surroundings. Luckily, its keen senses of smell and hearing compensate for this failing.

When disturbed, the okapi gallops away, carrying its head forward in line

with the body. It can keep up a fast pace for long distances. A leaf-eater, the okapi browses on forest trees. It is often solitary, though sometimes two may be seen together. The single baby is built like the adult and has the same unusual colouring.

The okapi's colour is distinctive, with the body and neck a rich dark-brown, and the head buffy white. The markings on the hindquarters are unique—slantwise stripes of black and white. The lower limbs are white with a narrow black band. The comparatively long tail ends in a tuft of hair.

The okapi's tongue, like the giraffe's, is extendible, and the lips—again like the giraffe's—are prehensile. Thus the tongue and lips are adapted for picking foliage. There are also resemblances between the two animals in the teeth. The feet are of the regular even-toed hoofed-mammal type.

Although the okapi's limbs and neck are relatively long, they have none of the

exaggerated qualities typical of the giraffe. The body is short and compact, and the hind limbs give a deceptive impression of being much longer than the front limbs. The male okapi stands a bit over five feet at the shoulder; the female is smaller.

One of the most striking resemblances of the okapi to the giraffe is found in the horns. In the okapi, they have a maximum length of five inches, and are covered for most of their length by hair. Unlike the horns and antlers of deer and antelope, the okapi's horns do not grow out from the skull. They actually are independent of the skull before birth, being within the flesh; later on they grow downward and become firmly fused to the skull. This is also true of the horns of the typical giraffes.

The okapi's favourite haunts, so far as we know, are in the Semliki and Ituri forests of the upper Congo in the African equatorial zone.

## Even-toed Hoofed Mammals: 6

### Buffaloes, Wild Cattle and Oxen

The oxen, or cattle, are the most important members of the animal kingdom so far as man is concerned, for they supply him with meat and milk in great quantity. The Egyptians and Babylonians were among the early peoples that used oxen for their needs. They milked their cows as early as 3,000 B.C. However, man kept oxen long before the Egyptian civilization arose; he may have used them originally for sacrificial purposes. The ancient Chinese harnessed the oxen as beasts of burden, but they never milked any of their female animals.

Although, from the human standpoint,

the oxen are the most valuable members of their family (Bovidae), that family includes other groups of animals that are of the greatest economic importance to us.

There are, for example, the goats and sheep. The domestication of these two animals goes back some five thousand years; for much of that time, people all over the world have been dependent on them for food and clothing.

The antelopes, limited to Africa and Asia, make up a fourth group. They are handsome creatures, still in the wild state with one or two minor exceptions. They are favourite game animals.

## Water Buffalo

Finally, the family Bovidae includes the goat antelopes, animals that live in almost inaccessible mountain regions. As their name indicates, they share some of the characteristics which we associate with goats and antelopes.

For the most part, the Bovidae are an Old World family, well represented in Asia and Africa and only moderately so in Europe. No members of the family are native to South America, Australia, or Madagascar. North America has only a few Bovidae, but they are spectacular beasts—the musk ox, the almost legendary bison, the Rocky Mountain goat, and the

bighorn sheep.

A word about the Bovidae in general. They all have cloven hoofs—that is, they are even-toed. They are ruminants, or cud-chewers. All have permanent horns, simple and unbranched. These consist of a hollow horny sheath growing over pointed bony cores that arise from the front of the skull. The horns continue to grow throughout the life of the animal and are never shed. Always occurring in pairs, the horns are often—though not always—present in both sexes.

We turn back now to the first group of this great family, the wild oxen.

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## The Oxen Family

The tame cattle of today are descended from wild ancestors. One of the most interesting was the **Aurochs**, or **Urus**, *Bos taurus primigenius*, once found in many parts of Europe and in northern Africa from Egypt to Morocco and Algeria. This large beast—it stood six feet at the shoulder—had disappeared in Britain before the arrival of the Romans (who elsewhere referred to it as *Bos urus*), and became extinct as a wild animal early in the sixteenth century; the last known specimen died in Poland in 1627. The aurochs was once plentiful in Palestine; it appears to be mentioned in the Bible as the “unicorn.”

**The Asiatic Buffalo, Carabao, or Water Buffalo**, *Bubalus bubalis*, fears no living thing in its native jungle. There have been occasions when a water buffalo disputed the right of way with an elephant! Even the huge rhinoceros is more discreet—at least in respect to challenging an elephant's right of way.

Savage and unreliable in disposition, especially when aroused, the water buffalo is an extremely dangerous animal to

stalk. This is due in some measure to the dense cover in which it is found, but even more to the fact that this behemoth has comparatively little fear of man and seems to be able to sense when it is being followed. It will take the offensive against a tiger, and—what is still more impressive—it is capable of besting the big cat in a duel. Like the tiger, the water buffalo is hunted in India from the back of an elephant.

Bred in captivity, the water buffalo is very different from its wild relatives. The domesticated animals are so gentle that they can be driven in herds by native children. What makes the contrast even more amazing is that you generally cannot tell the wild from the domesticated varieties, as far as mere appearance is concerned.

Although the water buffalo's milk has a high butter-fat content, the animal is not so important as a dairy animal, since its supply of milk is rather scanty. On the other hand, the cowlike tractability and docility of the domesticated buffaloes qualify them as useful draft animals, and they have been pullers of ploughs and carts since ancient times.

The huge water buffalo exceeds all the oxen in size—a large bull stands five feet at the shoulder. As for the horns, they are the largest in the whole Bovidae family. The shape of these horns varies somewhat. The typical ones are rough and flattened, sweeping out from the sides of the head in a wide arc. However, some water buffaloes have horns that are nearly straight at the base and turn up only near the tips. Measured along the curve, the greatest recorded length for the horns of this species is a trifle over seventy-seven inches.

Heavily built, this powerful animal has stout legs and a long tail ending in a brush of stiff hairs that serve as a fly-swatter. The muzzle is large and square; the head is carried low. Scantly haired, the water buffalo's hide is dark ashy-grey, almost black, in colour.

The water buffalo, as we might gather from its name, loves the water and is never so happy as when it is wallowing in a soft mud-hole. Here it will stay for hours during the heat of the day, with only its eyes and nostrils exposed, blissfully softening its thick hide in the ooze. In the water

it is safe from torment by the hordes of biting fleas and other insect pests.

Old bulls are usually solitary, having their own particular home territory and guarding it zealously against all newcomers. In general, however, cows and their calves associate with a bull in herds of various sizes. Cows have one to two young at a time during the summer, ten months after mating.

We still find the water buffalo in the wild state in north-eastern India, Ceylon, and parts of Indo-China and the Malay Peninsula. It favours tall-grass country and reed beds that border watercourses and swampland.

**The Tamarao, or Philippine Pygmy Buffalo,** is a small buffalo of the southern Philippine Islands. Its short, stout horns are about twenty inches long. Frequenting thickets and marshes along watercourses, it also dwells in bamboo forests in the mountains up to altitudes of six thousand feet.

The **Celebes Anoa, or Pygmy Buffalo,** is the smallest of the wild cattle. It has shorter and straighter horns than the tamarao—they rarely reach a length of fifteen inches. We are told that the Celebes anoa lives alone or in pairs, frequenting the wooded mountain slopes in the Celebes.

**The Zebu or Humped Cattle** of India, *Bos indicus*, are held sacred in their native land—especially by the Brahmins. Following the tenets of Hindu faith, the bull is dedicated to Brahma, the supreme creator. When branded with the mark of Siva, the four-handed deity of destruction, this bull is allowed to wander where it pleases. No Hindu would dare object, even should it take a fancy to the vegetables in his garden or even in his shop. (Some monkeys enjoy a similar status to the zebu in India.)



Zebu

## Yak

The zebu are probably of aurochs stock, and were domesticated in Asia by 4,000 B.C. Divided into many breeds, they differ mainly from European cattle in having a much enlarged fatty hump on the shoulder. Usually they possess a big dewlap, short horns, and long ears. Some breeds are much smaller than the typical ox.

Throughout India, people hold the oxen in high esteem and they rarely eat the flesh—except that of an animal that has died. It is not unusual to hear a native call a dear friend of his “my ox.”

India is not the only home of the humped cattle. They are also found in China, the East Indies, and East Africa. In these areas the animals are kept for meat and milk, for riding, and as beasts of burden.

**The Yak or Grunting Ox, *Bos (Poephagus) grunniens*,** got its second name from the gruntlike sounds it makes, especially when it is loaded beyond comfortable capacity.

In the wild, the yak frequents the plateau of Tibet, among the coldest and most desolate parts of the world, at elevations of fourteen thousand to fifteen thousand feet in winter—up to twenty thousand in summer.

The domesticated yak, a somewhat smaller animal, has served its country well—it might almost be taken as a symbol of Tibet. This buffalo-like animal is milked (Tibetans have many uses for rancid yak butter, and are fond of it in tea), ridden, driven, and carries heavy loads over mountain passes. In this lofty land where the people are not governed by pressure of time, the yak can fulfill almost all their transportation needs.

Large yak bulls are nearly six feet high at the shoulder and weigh twelve hundred pounds. The legs are short, with large,



## Yak

**Still existing as a wild animal, one form of yak has been fully domesticated by the Tibetans.**

rounded feet, and the muzzle and ears relatively small. Smooth, round horns curve upward, outward, and then forward. The hair on the back is smooth but very long on the lower parts, hanging from the sides of the body in a long, sweeping fringe. (Yak hair is widely employed by the Tibetans, and a team of yaks may be harnessed by rope made of their own hair.) The yak's general colour is dark brown, almost black, throughout—except for a little white on the muzzle.

Yaks feed in the early morning and evening on the rough, wiry grass that grows in the upland valleys. During the day these sure-footed and hardy mountaineers retreat to rest on the steep, barren hillsides, where they command a wide view of the surrounding country. Their sight and hearing are not exceptionally good, but they do have a well-developed sense of smell.

During the summer, cows and calves collect in herds of ten to one hundred. The bulls are more or less solitary, except during the rut, when each bull separates four or five cows from the herd. Mating

takes place in winter, and the calves are born in the autumn, ten months later.

**The Gaur, or Seladang,** *Bibos gaurus*, is among the largest of wild cattle. This forest animal, the so-called Indian "bison," attains a height of over six feet at the shoulder, and has a head and body length of nine feet, six inches.

Like the yak, the full-grown bull is dark brown, almost black, though the legs from the knees and hocks down are white. The upturned horns are broad, heavy, and tipped with black. The hair of the gaur is nothing like as long as that of the yak.

The cows, which are smaller than the bulls, stand about five feet high at the shoulder and their colouring has rather a reddish cast. The gaur's body is deep through the chest and very massive, with a high ridge from the neck to the middle of the back.

Grasses and shoots of the bamboo and other trees make up the principal diet of the gaur, which keeps to the forest and tall grass, generally near the hills, in India, Burma, and the Malay Peninsula. A shy and timid animal, this creature travels in small herds of five to twenty or more.

Most of the natives and hunters agree that the gaur is a very inoffensive creature, rarely attacking anyone; the bull which has been expelled from the herd may, however, be inclined to make trouble. A wounded animal is also dangerous. Hunting the gaur was a favourite sport of the Englishman in India; if his first shots did not kill the gaur, the hunter sometimes had to face the deadly rush of the agonized beast.

Attempts to raise the gaur as a domestic animal have failed—unless, of course, it could be proved that the gayal (described below) is a breed of gaur. Calves always

die in captivity before they grow up.

**The Gayal, or Mithan,** *Bibos frontalis*, dwells in the same forests as its big cousin the gaur, but depends on man for its food. The animal is very similar in colour and general appearance to the gaur, though somewhat smaller, with shorter limbs and a less pronounced ridge on the back. The horns are broad and heavy, but nearly straight instead of curved like those of the gaur. The range of this species of cattle includes the hills of Tipperah and the regions south of the Assam Valley in India.

The gayal is used by the natives for food and for its milk. We have reason to believe that the gayal is actually a half-domesticated race of the gaur.

**The Banting, or Tsaine,** *Bibos sondaicus*, the typical wild ox of the Malay lands, resembles a Jersey cow more than anything else. Much smaller, lighter in colour than the gaur, and even more timid, it has been successfully domesticated by the natives.

The common banting lives in Java, but it has close relatives throughout south-eastern Asia. It has much the same habits as the gaur, though it prefers low-lying grassy plains and bamboo forests to the more hilly homeland of the gaur.

**The Kouprey,** *Bibos sauveli*, is also known as the **Grey Ox** and **Indo-Chinese Forest Ox**. Strange as it may seem, it escaped the attention of science until a little over twenty years ago, when a living specimen was sent to the zoological gardens in Paris.

Another interesting thing about the kouprey is that the horns of the adult male burst open at the tip, exposing about five inches of an inner black horn.

A typical oxlike animal, the kouprey is over five feet at the shoulder. Its head

## Cape Buffalo

and body length is eight feet, and the tail is quite long—over three feet. The hair is short, close, glossy, and blackish brown in colour, with occasional white markings down the back. The feet are usually white.

The kouprey, so far as we know, is found only in Cambodia and Laos.

**The Cape Buffalo**, *Syncerus caffer*, is a large, thickset black buffalo with massive horns, a short head, and large, fringed ears. The broadly flattened horns arise close together on the top of the head, where they form a helmet-like shield, then extend backward and outward, curving up evenly to a sharp point.

Viewed from above, the horns are somewhat like triangles—very broad at the base (sometimes more than twelve inches) and tapered sharply to the tip. The total length along the outer curve of the horn is up to thirty-nine inches. A full-grown bull stands about five feet high at the shoulder and weighs about fifteen hundred pounds.

The ideal dwelling place for the Cape buffalo contains an ample supply of water, a large pasture of grass and reeds, and a background of forest or jungle for shelter. Under such conditions, herds may range from fifty up to a thousand.

African buffaloes feed during the early morning and late evening and often at night, but they rest in the bush during the heat of the day. Usually the buffalo is a very silent creature and large herds, when feeding, never make a sound. The buffalo will bellow when attacked by lions. However, they prefer to hunt the cows and calves rather than the big-horned bulls that can put up a terrific battle against a single lion.

Cape buffaloes have a normal life span of at least sixteen years; some have lived ten years in captivity. The mating season starts in January, and the calves are born

eleven months later.

The African buffalo is spread over most of Africa south of the Sahara, but disease and hunting have greatly reduced its numbers. Like most other big game, this buffalo suffers severely from rinderpest, which is spread by the domestic cattle of wandering natives. On one occasion, a rinderpest epidemic practically reduced to zero the entire buffalo population of Kenya Colony for nearly twenty years.

**The Dwarf Forest Buffalo**, *Syncerus nanus*, sometimes called the Bush Cow, dwells in the forested regions of central and western Africa. A distinct species, it is much smaller than the Cape buffalo. The shoulder height is about four feet, the dressed weight about 580 pounds. The coat is typically red, but bulls turn black with advancing age. The horns, flattened at the base, are directed in a backward curve and do not exceed thirty inches in length.

**The American Bison, or Plains Buffalo**, *Bison bison*, once roamed the North American plains in vast herds of as many as four million individuals. One single herd would cover an area twenty-five miles wide and fifty miles deep. The total number of bisons in North America at the time the white man arrived has been estimated at sixty million. By 1900, only three hundred of these huge creatures were left in the United States. Today there are several times this number in Yellowstone National Park, where they are prospering.

Civilized man has never beheld a greater concentration of big game than the buffalo herds in their heyday. Not only the Indians, but the early western settlers as well, depended largely on the buffalo for their livelihood. The great beast furnished the materials for food,

## European Bison

clothing, shelter, and heat.

A great, powerful beast with a massive head and neck and humped shoulders, the bison is, however, surprisingly narrow, especially in the hindquarters. A thick mantle of long, shaggy hair envelops the head, neck, and forelimbs but stops abruptly at the shoulders. A long black beard hangs from the chin of adult males, and the rest of the body is covered with comparatively short, close hair. The short, stout horns curve out and upward, while the tail, though short, carries a tassel of long hair.

Average full-grown bulls measure over five feet high at the shoulder and weigh around sixteen hundred pounds. The record weight is three thousand pounds. Cows are considerably smaller, weighing from seven hundred to nine hundred pounds. The general colour of the animal's coat is a rich dark brown, becoming almost black on the head and shoulders. With the coming of spring and the moulting season, the black cape fades to a pale yellowish brown.

At the approach of the rutting season in June and July, the bulls fight for supremacy of the herd. Battles between

two evenly matched bulls may last two days and a night in succession. The animals often struggle until both are exhausted, and sink to their knees; then they take up the fight again after a brief rest. When the issue has been settled, the victor is comparatively quiet, presumably too busy with his females to remember his recent quarrelsome feelings; as for the vanquished bull, he bellows incessantly, day and night. Bulls rarely make an unprovoked attack on man, even during the rutting season.

The calves may come any time between April and June, but most of them are born in May, nine and a half months after the adults have mated. Usually there is only one calf, occasionally twins. The newborn calf's coat is bright tawny, almost yellow, with a dark reddish band down the middle of the back. By the time the mother has licked her offspring from head to foot, the calf is ready to stand on its shaky legs for its first meal.

Most animals will turn their backs to a storm—not so the bison. Better clothed in front than behind, it will meet a blizzard of driving snow and bitter cold with its head directed into the wind.

**The Wood Bison**, another variety, is larger and taller than the plains bison. The last of the truly wild bison, it still exists in the remote Slave River region of northern Alberta in Canada. The shoulder height of grown bulls may exceed six feet. These animals are marked by a broad brown band extending down the middle of the back.

**The Wisent, or European Bison**, *Bison bonasus*, once at home in many of the forests of Asia and Europe, including England, is now extinct in the wild state; the few remaining animals are in the Duke of Bedford's park at Woburn Abbey.



**Bison**

These huge cattle appear in Europe and North America in two separate forms.

## Pronghorns

in southern England.

A typical bison in appearance, the wisent has humped shoulders covered with a close curly mane. The rest of the body is covered with short, thick, woolly brown hair. The horns are short, rounded; and curled slightly upward.

Larger than its American cousin, the European bison (or aurochs, as it is often

erroneously known) has a mane which is shorter and less shaggy than the New World bison's. The bull of the European bison is the largest of the native European mammals. Weighing up to two thousand pounds, it stands over six feet at the shoulder, and measures over ten feet from the nose to the tip of the tail.

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## Even-toed Hoofed Mammals: 7

### Pronghorns

The original pronghorn country extended from the southern junction of Saskatchewan and Alberta in Canada, through the region southwest of the Mississippi valley, to central Mexico. Today we find the animal only in a few favoured sections of the upland plains in the Rocky Mountain area.

The pronghorn is distinctive, above all, for its unique horns. Like the horns of sheep, goats, and antelopes, they are hollow and composed of a sheath that covers a bony core. Despite this similarity, the pronghorn's horns are different in two ways.

One difference is that the horns of this animal are pronged (hence its name). None of the other hollow-horned hoofed mammals has this feature. We might accept this branching of the horns as a reasonable variation of the hollow-horned group if it were not for the second remarkable difference; while the others keep their horns for life, the pronghorn sheds its horny sheath every year.

The entire outside sheath is eased off the bony core by the formation of the new horn underneath, and is shed in the autumn soon after the rutting season has ended. The new sheath begins to grow from the tip of the core, and spreads

slowly downward until it reaches the base. During the time it is growing, it is covered with skin and hair, which are lost when the horn matures and hardens. Both bucks and does have horns, but the females have smaller and more slender ones than the males. In fact, some does lack horns altogether.

Most animals have some means of communicating with their fellows. This is especially true of the social creatures that live in herds. The pronghorn's signal is one of the most remarkable pieces of nature's handiwork—it is quite silent.

This is how it works. The hairs on the animal's rump are white and longer than those found anywhere else on the body. The roots are embedded in special muscular sheaths, which make it possible for the pronghorn to erect the rump hairs at will in the shape of a great rosette.

When the animal raises this white rosette or shield, it reflects an incredible amount of light. The shield is especially brilliant if flashed in the bright sunlight, and can be seen from a distance of nearly four miles. Sensing danger, the pronghorn transmits its fears by this flashing signal, thus alerting the pronghorns and other animals in its vicinity. The pronghorn usually travels without making a sound.

It is true that we often refer to the **Pronghorn**, *Antilocapra americana*, as the pronghorn "antelope," and that in a general way it does resemble an antelope. Yet the pronghorn is not an antelope. It shows certain traits of deer and cattle, but, for all that, it does not belong to either of these families, nor is it closely related to any other group of animals found under the heading of even-toed hoofed mammals. And so scientists have had to allot the pronghorn a family all to itself, the Antilocapridae.

Living as it does on the great open spaces, where there is no shelter from bitter winter winds, the pronghorn has a special insulated coat that helps to conserve body heat. This covering is made up of long, tightly packed hair, full and deep. Each hair is a hollow tube filled

with a pithlike substance. A rich reddish brown or tan, the coat is darkened on the mane along the neck with blackish brown.

The pronghorn is medium sized, as animals go. Grown bucks measure thirty-two to forty inches at the shoulder, and weigh from 100 to 125 pounds; females average ten per cent smaller in size and weight. Specially adapted for travel over hard, arid plains and upland plateaus, the pronghorn, unlike most other ruminants, has no small "extra" hoofs (dew-claws) on the back of its foot.

With a top speed of nearly a mile a minute, the pronghorn is the swiftest runner in America. In fact, in the whole world, it may rank second, next to the cheetah of India. Pronghorn dry does (does that have borne no young), by the way, are fleetier than the bucks.

## Even-toed Hoofed Mammals: 8

### Antelopes

The antelopes are famous for their speed, grace, and good looks. Generally creatures of light and slender build, they nevertheless come in many shapes and sizes. In this big group of animals we find, for example, the Royal Antelope, which stands only ten inches at the shoulder—and, by way of startling contrast, the Giant Eland, an oxlike animal which weighs twelve hundred pounds.

Among antelopes' horns there is a great deal of difference, too. As a rule, an antelope's horns rise from the head and then sweep backward. Yet some horns are straight, some spiral shaped, others lyre shaped; still others have fantastic curves. There are even antelopes with four horns instead of two. Among some

kinds of antelope, both sexes have horns; among others, only the males are horned. Even the length of the horns shows startling variations—on the smaller antelopes we find horns that are mere stubs, while the larger animals may have horns sixty inches long.

Some antelopes gather in herds of anything up to ten thousand; others are shy, elusive, solitary creatures. Where do these cud-chewers live? In all sorts of places—marshes and swamps, deserts, open plains, dense forest, and mountains. Africa is the home of most antelopes; there are also some that are native to Asia. We do not find these animals outside the Old World. We divide the antelopes into nine separate groups.

## Antelopes with twisted horns

**The Greater Kudu, *Strepsiceros strepsiceros*,** a large creature with lengthy corkscrew horns, is one of the stateliest-looking antelopes in all of Africa. Sometimes called "the antelope king," it has been described as the finest of all its tribe—and not without reason.

In their dances of triumph to celebrate the killing of a lion, the natives often give periodic blasts from their traditional kudu horn trumpets. This is about as near to a wild greater kudu as the average hunter or traveller will ever get. Outside parks and game reserves, the kudu is extremely timid and elusive.

If one is to see the greater kudu at all, it will be in the bush or in scrub-covered rocky hills, where the animal can climb like a goat and keep a sharp watch for approaching danger. It is helped by the camouflage of its striped grey coat, which is difficult to make out in the bush.

When the kudu is hunted and hard pressed by dogs, it will take to the rivers, swimming steadily downstream. Usually it outdistances its pursuers in the water. At times, it proves to be a most courageous animal—when cornered or wounded, it will attempt to defend itself against both man and dogs. Hunters say that an experienced old bull, once it knows it is being tracked, will try to startle a less mature kudu out of the bush so that the attention of the pursuers will be diverted. How true this is, only the old bull can definitely answer.

The glory of the kudu bull is its magnificent horns. They may reach a length of sixty inches or more, and are fashioned in the form of long, wide, open spirals of two and a half turns; cows are hornless.

This proud, erect animal stands almost five feet at the shoulder, and bulls weigh between five hundred and seven hundred pounds. The coat is greyish brown in colour with vertical white stripes along the sides of the body. The face is bedecked with white markings on the nose, cheeks, and around the eyes. The kudu's ears are large, the tail moderately long and tufted. There is a fringe of long hair on the throat of both male and female.

Except during the breeding season, when small herds or family groups are the rule, the sexes live apart, and the males keep bachelor quarters. Bulls fight during the rut. The deep, hoarse barks or "bugles" of the kudus are the loudest sounds made by any antelope.

Cows usually have one calf at a time, seven or eight months after mating. Kudus have survived in captivity for over eleven years.

The range of the greater kudu and its local relatives extends from Ethiopia to South Africa. In the bush and rocky hill country which it loves, its favourite food is leaves, grasses, and wild fruits.

**The Lesser Kudu, *Strepsiceros imberbis*,** is a remarkable jumper. It can cover over thirty feet in a single leap over bushes; it almost seems to be flying as it sails gracefully through the air, six feet above the ground.

Similar to the greater kudu in appearance, this lesser relative is much smaller; the colours are brighter, the horns less divergent, there is no fringe on the throat. Vertical stripes adorn the lesser kudu's body, while a white arrow bridges the nose below the eyes. The shoulder height is usually under forty inches.

A very timid and inoffensive creature, the lesser kudu is found in the dry, bush-covered plains from Somaliland to Kenya in north-eastern Africa.

**The Sitatunga, or Marsh Buck,** *Limnotragus spekii*, comes as close to being a water animal as any antelope. Its home is the big swamps and watercourses of central and eastern Africa. In the sitatunga's damp haunts, the natives usually pursue the wary beast in dugout canoes. In the dry season they are able to fire the bush and drive the sitatunga out into the open.

The sitatunga can swim, dive, and travel a considerable distance under water. When frightened, it frequently takes refuge in deep water, often lying submerged with only the nostrils and eyes above the surface. Its feet are especially adapted for a life near water. The halves of the long, slender hoofs spread widely when the animal walks or runs, thus providing ample support on a tangled mass of weeds. On the soft mud it leaves a V-shaped spoor.

The sitatunga never ventures out into the open to feed except at night; when disturbed, it makes for the nearest marsh or swamp. On hard ground it is clumsy, even awkward, and can be overtaken by a fast runner.

Grown male sitatungas stand a bit less than four feet at the shoulder. Their hair is brown, with stripes. Males have spiral horns twenty-eight inches long measured in a straight line from base to tip, and thirty-five inches following the spiral curve. Females are hornless. They and the young are of a bright chestnut colour, with white stripings and spottings, as a rule.

**The Bushbuck, or Harnessed Antelope,** *Tragelaphus scriptus*, is a lover of solitude; it lives alone, or at most in pairs during the breeding season. Active only by night, it lies up by day in dense brush. Both sexes utter a hoarse bark, but the male has a louder and harsher note than



**Immature Bushbuck**

**A small antelope found mainly in forested country south of the Sahara.**

the female.

The bushbuck is one of the wariest of African antelopes and frequently takes to water. It generally trusts for safety to its wariness and the concealment offered by the bush. The bushbuck is rather noisy, however, and utters its deep bark when it hears unusual sounds or smells a man or a leopard. When wounded, the animal often proves to be quite dangerous. There are instances of rams killing a man, a leopard, and a wild dog. In captivity the bushbuck is very aggressive; the rams may kill or severely injure the ewes.

The males of the subspecies of bushbuck differ greatly in colour, varying from a nearly black animal to a bright chestnut. All forms have white stripes running down each side, two slantwise stripes, a dozen or so white spots on the hind limbs, and a white band across the chest. The young and the females are always a bright chestnut with characteristic white stripings. A small antelope, the bushbuck seldom stands more than three feet at the shoulder. Its simple spiral horns rarely exceed eighteen inches in length. There is a fringe of stiff, erect hairs along the back.

The bushbuck is found in many parts

## Nyala

of Africa south of the Sahara, and there are well over twenty named geographical forms. Primarily a forest animal, it also occurs in the thorn-bush country and may feed in the open-range country bordering the forestlands. Occasionally it invades and damages gardens and farmlands.

Bushbucks breed at all seasons of the year and the young are born from six to seven and a half months after mating time.

**The Nyala**, *Tragelaphus angasii*, is a handsome, short-haired antelope with a distinct colour pattern for each sex. "Nyala" or "Myala" is the native Zulu name for this most beautiful antelope.

A relative of the bushbuck, the nyala frequents the hot, low country and more or less open bush near rivers and lakes in Zululand and the neighbouring country.

Occasionally the nyala is solitary, but more often it is seen in small parties of females and young, or equal numbers of males and females. Often the males spar together with their horns; but once the rutting season arrives, they battle in real earnest.

Males are slate grey and stand about forty-two inches at the shoulder. They have spiral horns that measure twenty-four inches in a straight line and thirty inches with the curves. The females are hornless and reddish chestnut in colour. Both sexes are beautifully marked with numerous vertical white stripes on the body and a white spinal fringe extending from the shoulders to the base of the tail.

The Mountain Nyala, largest of the bushbuck types, occurs in the highlands of southern Ethiopia. It stands four and a half feet at the shoulder.

**Elands.** The Eland got its name from the Dutch settlers. *Eland* is the Dutch word for "elk," an appropriate name, the

Dutch felt, for the largest species of antelope they had encountered. Actually the eland is quite different from either the elk, or other antelopes. A heavy fold of skin—a dewlap—hangs from the bull's neck, and this enormous creature is rather oxlike in appearance.

For all its large size, the eland is swift and agile. It will often spring into the air, leaping high over the back of one of its fellows.

The eland is continually on the move. Alarmed, it makes off at an exceedingly fast trot which produces a faint clicking sound. This sound, attributed to the click of the hoofs, can be heard for quite a distance. A horse has to extend itself to full gallop to keep up with a herd of elands.

When disturbed or suspicious of danger, an eland always runs against the wind. It can be swerved to one side or the other, but it will not run downwind. An eland will charge a man on horseback who happens to be directly in its way, rather than face about. However, this is the only time that the eland will make an aggressive move against man.

The eland favours country in between the open veld and forest country. Though it feeds far out on the open plains, it prefers to rest in the shelter of trees during the midday heat. Loving society at all times, the eland assembles periodically in migratory treks. On such occasions, several groups may associate in oversized herds.

This beast can live independent of water, but where water is available it will drink twice a day during the dry season. It grazes where it can get fresh young grass; it also browses on leaves and twigs of trees.

Of all antelopes, the eland is the closest to the cattle. It is surprising that this animal has not been domesticated; it is easily tamed, not aggressive, of large size,

and its meat is of fine quality.

**The Common Eland, *Taurotragus oryx*,** ranges from Kenya Colony to South Africa and Angola, where it frequents grassy plains in herds of about fifty and sometimes as many as two hundred. It is often found in company with other antelopes and zebras.

The bull of the common eland stands from five and a half to six feet in shoulder height and may weigh up to twelve hundred pounds. The animal's coat is a pale fawn with a few white body stripes, but old bulls are rather near blue grey in colour. It is curious that the spirally twisted horns are longer in cows than in bulls—thirty-three inches following the



**Bongo**

An elusive antelope, which though large and heavy, is rarely seen.

twist.

The common eland's breeding season begins at the end of March and extends into May. The young are born about 256 days after mating takes place. These animals are fairly scarce today in the southern part of their range, having been heavily hunted for their excellent flesh and strong hides.

**The Giant Eland, or Derby's Eland, *Taurotragus derbianus*,** the largest living antelope, will survive for a long time if the protection afforded it in the Sudan continues to be enforced. More reddish than the common eland, this sturdy creature has a great many white vertical stripes on the sides of the body. The horns are long and massive, particularly in the bulls.

This antelope frequents wooded localities from Senegambia to the Sudan and Portuguese Guinea in West Africa.

**The Bongo, or Broad-horned Antelope, *Boöercus eurycerus*,** is one of Africa's most elusive animals. Keeping close to the jungle, it never shows itself in the open. No wonder the bongo is considered one of the most coveted trophies of big-game hunters.

A hunter may spend days winding his way through a trackless bamboo forest in search of this beast and yet be rewarded by nothing more tangible than the hearing of a loud crash in the dense thickets, betokening that a bongo has been startled and has bolted, unseen. To preserve itself the bongo depends more on its ears than on its eyes or sense of smell. The antelope is fortunate in that no human being can hope to penetrate the jungle of its home grounds without snapping a twig or giving the animal some other indication of his presence. Still, hunters continue to seek it in its native haunts, the dense bamboo

## Nilgai

forests of West Africa and some of the forested mountain regions of East Africa.

The adult bongo averages a shoulder height of four feet. It has a rich chestnut-red colour with vertical white lines on the sides of the body. Bulls grow darker with age and become black about the head and neck. Both sexes have massive horns that spiral in one complete twist, but the female's are not so large as the male's. The horns are a choice trophy for any hunter.

Old bulls are usually solitary, but the cow and calves and possibly a bull associate in small parties.

## Deer Oxen

**The Nilgai, or Blue Bull**, *Boselaphus tragocamelus*, is common in central India, where it is regarded with reverence because of its colour. The largest Asiatic antelope, it stands about four and a half feet at the shoulder. In a general way its form is somewhat horselike, but the neck is deep and compressed, while the tail reaches the hocks. The horns are curved spikes—they are rather short (eight to nine inches) and triangular at the base. It is easy to tell the sexes apart. The bull is iron or blue grey in colour, with a tufted throat, while the cow is hornless and fawn coloured. Both sexes have a mane of stiff hairs.

In some localities the nilgai becomes quite tame. It wanders across cultivated lands and is troublesome to crops. However, as the Hindus regard it as a sacred cow, most do not molest it. Sportsmen rarely care to shoot the nilgai; its meat is inferior to that of most Indian wild game.

When alarmed, the nilgai travels at a fast gallop. A bull can only be overtaken by a good horse, while a strong and fleet nilgai cow; it is said, cannot be run down by a single rider.

Each year the cow nilgai gives birth to one young—sometimes a pair—eight to nine months after mating. Old bulls are often solitary, but parties of fifteen or twenty animals are not unusual.

**The Four-horned Antelope**, *Tetracerus quadricornis*, differs as much from other Indian antelopes in habits as in appearance. It is extremely shy and solitary; more than two individuals are rarely seen together.

This antelope dwells along the base of the Himalayas from Punjab to Nepal and in other parts of the Indian Peninsula. Here it frequents scattered forest country and thin bush, and undulating or hilly ground in particular. It moves with a peculiar jerky motion.

Whereas the doe is hornless, the buck, unlike other antelopes, has two pairs of horns. The additional pair, located on the forehead, rarely exceed two inches in length and often exist only as short knobs. The normal or posterior horns are simple spikes not more than four or five inches long. This antelope's colour is pale brown. An average buck stands two feet at the shoulder and weighs forty-three pounds.

The young—one or two in a litter—are born in January or February, about six months after mating time.

## Duikers

Duikers, or duikerboks, are small African antelopes that frequent forest and bush country. They average about two feet in shoulder height. Duiker means "diver," a name given these small antelopes because of the way they plunge into the underbrush and thickets.

There are at least twenty kinds of duikers; these have been divided into about eighty named geographical forms. In almost all, both sexes have short-spiked

horns. In general we place these creatures in three groups: bush duikers, blue duikers, and forest duikers. The first group is the commonest.

**The Duikerbok, Common Duiker, or Bush Duiker,** *Sylvicapra grimmia*, is plentiful over all of Africa, from the Cape of Good Hope to Ethiopia. The colour of the coat varies from greyish brown to bright yellow. The males have short horns; the females are usually, though not always, hornless, unlike other duikers.

The duikerbok lives in thick brush country, where it remains concealed until forced to leave; then it gallops off, more like a rabbit than an antelope. Particularly noticeable at such times is the white "flash" of its tail as it dodges from one bush to another or to the nearest patch of cover.

A male and a female usually associate together. When one darts off, its mate is usually concealed at no great distance. However, the two animals usually take off in different directions.

While both sexes are alike in colour, the female may be bigger than the male. The average shoulder height is about twenty inches, while thirty pounds is the maximum weight. The young differ from their parents only in shade of colouration. Several all-white duikers have been recorded.

Though twins are not frequent, they seem to occur more often than among some other African antelopes. The adults mate in October, and about seven months later, generally in May, one or two young are born.

**The Zebra Duiker.** The Zebra duiker is one of the most strikingly coloured of the many species that are included in this group of small antelopes. A beautiful little creature, it has an orange-red coat

marked with tiger-like stripes of black on the back. Inhabiting the dense forest of Sierra Leone, the zebra duiker is known there as the "mountain deer."

## Marsh Antelopes

**Waterbucks.** The waterbuck goes about in herds of from five or six to about twenty animals—though some groups may take in as many as a hundred. One bull usually has a harem of ten or twelve cows.

A grass feeder, the waterbuck usually occurs on grass flats near water or swampy plains. Where there is waterbuck, you may be sure that water is no more than five or six miles away.

Though it lives on solid ground the waterbuck, when hunted, will take readily to the water; it is a good swimmer. Followed by dogs, it will turn on them if it possibly can in deep water when it has the advantage. Still, the waterbuck is not a water antelope in the strict sense that the sitatunga is.

The **Defassa, or Sing-sing Waterbuck,** *Kobus defassa*, is a large antelope about fifty inches at the shoulder, with coarse, rather long shaggy hair. Males have lengthy, heavily ringed horns, lightly curving backward, upward, and slightly forward at the tip; females are hornless. The defassa waterbuck dwells in western and north-central Africa. Greyish brown in colour, it has a large white patch below the tail.

The **Common Waterbuck,** *Kobus ellipsiprymnus*, is about the size of the defassa. Large bulls range between 400 and 550 pounds, bearing horns that measure anywhere up to thirty-nine inches, though the average is considerably less. Darker in colour than the defassa, the common waterbuck is distinguished by a conspicuous white line encircling

## Western Kob

the rump.

Male waterbucks fight fierce battles for the possession of the females. The calves, usually twins, are born eight months after the adults mate. Reddish at first, the young soon change to the mixed grey and black of the grownups.

The waterbuck has a wide range extending from South Africa to East Africa and Somaliland. Often it is seen together with wildebeests and zebras.

**Kobs.** Sociable creatures, the kobs usually travel in small parties of seven or eight. Every now and then the small groups join together to form a large herd of fifty animals or more, with both sexes represented.

In its habits the kob is somewhere in between the bushbuck and the lechwe. Always found very close to water, it favours solid ground on which to graze. We never find the kob on the treeless, flooded grass plains where the lechwe is at home.

**Buffoon's Kob, or the Western Kob,** *Adenota kob*, has somewhat lyreshaped, heavily ringed horns. The general coat colour ranges from rich tawny in the typical form to the brownish black of the white-eared kob of the upper Nile. The young, as well as the females, are reddish brown.

The full-grown adult male measures about thirty-five inches at the shoulder. Kobs are concentrated in Equatorial Africa, from Guinea to Uganda and the swamplands of the Nile.

The **Puku**, *Adenota vardonii*, is similar to the kob, but has much shorter and heavier horns. It is a reddish-yellow animal, with rather long, wavy hair. The shoulder height is about forty inches, the average weight 190 pounds. The puku frequents the swamps and plains of

northern Rhodesia, Nyasaland, and the Zambesi River valley.

**Lechwes** are much more at home in the water than bushbucks or kobs. Nearly always found in shallow water, the lechwe spends most of its time feeding knee-deep in a swamp. When resting, it lies up at the edge of the water—or even in shallow water.

A strong swimmer, the lechwe, when hard pressed, will make for thick reed beds, where it is hard to find. Crocodiles occasionally get a lechwe. Natives once produced the hide of a lechwe that had been hauled out of the jaws of a crocodile. The natives kill large numbers of lechwes for the flesh, which is quite tasty—far superior to the waterbuck's. The natives hunt the lechwes in canoes; they drive the animals into deep water, where they spear them.

Although it is the most water-loving of all African antelope with the exception of the sitatunga, the lechwe also travels on land in herds of from ten to fifty or more. Disturbed, this antelope moves with a lumbering gait. When the lechwe gallops, its head is lowered and outstretched, with the horns lying back on the shoulders. It is alert and wary, keeping well out in the open when feeding. It will dash for cover to hide at the slightest hint of danger. One of the noisiest of the antelopes, the lechwe, once it is alerted, utters a continuous series of croaking grunts.

The **Red Lechwe**, *Onotragus leche*, has rather long horns. They exceed twice the length of the head and show a slight double curvature. The red lechwe stands about forty inches at the shoulder and has long, coarse, black hair. It is common on the plains and in the swamps of Northern Rhodesia, Zambesi, and Nyasaland.

The **Nile Lechwe** is a handsome variety

which we find in the swamps along the White Nile. The long, slender, double-curved horns are ridged nearly to the tip, and the average shoulder height is about thirty-eight inches. Old bucks are dark brown—almost black—in colour, with a white patch on the shoulders. Females and young are chestnut.

**The Reedbucks** rarely show themselves in the open. Nor are they sociable; we are likely to see only one animal alone, or two together—a doe and her fawn, rarely a male and female. These gentle creatures are seldom found more than three or four miles from water. Feeding largely at night or early morning, they haunt tall grass swamps or reed beds.

One interesting point of difference between the reedruck and many other antelopes is this: while the reedruck is always found in the neighbourhood of water, it does not take refuge in it when pursued. Instead, it flees into the dry bush.

Alarmed, the reedruck moves off with a rocking gait, kicking its heels in the air and flashing its tail, white on the under side, like a rabbit. Whenever this antelope is suddenly startled, it utters a sharp, distinctive whistle. In places where many reedbucks are abroad, you can hear this whistle periodically throughout the night.

The **Bohor Reedruck**, *Redunca redunca*, found throughout most of Africa, frequents plains, swamps, and mountain country but avoids heavy forests. Slenderer than the kob, it has also a shorter and bushier tail. The black, ridged horns, twelve to sixteen inches long, spread upward and outward with a forward curve at the tip.

The average height of the bohor at the shoulder is about thirty inches, and the general colour is yellowish red. It is among the largest of the nine different kinds of reedbucks.

**The Grey or Vaal Rhebok**, *Pelea capreolus*, is a close relative of the reedruck. The vaal never enters the forest; instead, it lives in mountain passes and rocky glens in small family groups—an old male with five or six females and their young. Spending the day on the hilltops and descending to the lower plains to feed and drink, the vaal makes its way back soon after sunrise. This creature is possessed of boundless energy; it would be hopeless to try to overtake a vaal rhebok from below.

Projecting straight up from the head of the vaal are short, slender horns. Its ears are long and narrow, the tail moderately long and bushy. The somewhat woolly hair is pale grey, while the head and limbs are fawn coloured. Females are about twenty-eight inches high at the shoulder; males are two or three inches taller.

The vaal rhebok frequents the open hilly regions of South Africa.

## Sables, Gemsboks and Addaxes

**The Sable Antelope**, *Hippotragus niger*, is the most stately, if not the most magnificent, of all the antelopes. Its only possible rival is the greater kudu.

Unlike the deer and most other antelopes, the sable arches its neck when running—like the champion at the horse show. Though it can travel at a good speed if need be, it is not so fast as the wildebeest. Largely, though not entirely, a grass-eater, it favours thinly forested country where there is ample cover interspersed with open sunlit glades. Alarmed, it utters a series of snorts much like those of a horse. If wounded and cornered, the sable will fight savagely for its life.

Both male and female sable antelopes

## Roan Antelope

are well armed—they have superb sickle-shaped horns sweeping backwards from the face in an arc that may reach a length of sixty-four inches. The horns have extremely sharp points, and this courageous animal knows how to make effective use of them in defending itself from attack. About four and a half feet at the shoulder, the sable weighs 450 pounds. It has large ears and an erect mane.

Females and young are reddish brown with considerable white about the muzzle and below the eyes. Becoming darker with maturity, the males are almost black by the time they grow up.

The range of the sable antelope includes the Transvaal, Rhodesia, and the coast districts of East Africa, where it travels in herds of anywhere from ten to eighty—though groups of more than twenty are rare. Even in large herds there is only one adult bull. The old ones and the young competing males are not permitted to join the herd; instead, they associate in small bachelor groups.

**The Roan Antelope, *Hippotragus equinus*,** like the sable, can travel at a fast pace. Its gallop is rather heavy but strong and brisk, much like that of a horse. When it travels on hard ground, you can hear its hoofbeats for quite a distance.

Slightly larger than its cousin the sable antelope, the roan has considerably smaller horns—usually less than thirty inches long—and its ears are longer. The roan antelope stands almost five feet at the shoulder, weighing approximately 625 pounds. The male has a grizzled roan coat, very different from that of the bull sable antelope. The animal is a doughty fighter, as many a pack of wild dogs have discovered to their sorrow.

The roan favours rather open regions, usually upland, rolling country, not

thickly wooded. In East Africa it goes up to an elevation of sixty-five hundred feet, but it does not care for higher altitudes. Primarily a grass-feeder, the roan will travel long distances away from water; when water is available, the animal drinks regularly about daybreak.

There are seven known types of roan antelope, and their combined range extends throughout the plains of Africa north of the Orange River.

**The Gemsbok, *Oryx gazella*,** may not be the fleetest antelope on the African veld, but it requires an exceptionally fast horse to overtake one. When hard pressed or attacked, the gemsbok will boldly defend itself. Pursued by dogs, either domestic or wild, it will quickly turn on them.

The gemsbok has four-foot-long rapier-like horns that extend backward and upward from the head. Both sexes normally have horns, but those of females are longer. A gemsbok is fast as lightning with these sharp weapons. Natives report instances of lions found transfixed on the horns of the gemsbok.

Gemsboks are sociable animals, frequenting open country. A herd of gemsboks trotting in single file is one of the most spectacular sights of Africa. They stride along in soldierly fashion, their long, slender horns gleaming like bared sabres in the sunlight as these animals whirl about in unison before coming to a stand.

The gemsboks cover the plains with an easy, swinging trot or gallop and seem to skim along with an effortless glide. When they walk, their heads nod with each step, as in the case of a horse. The author has watched the graceful creatures gallop away across the veld. Singularly inconspicuous even in wide open spaces, they seem to disappear in the dancing mirages.

A gemsbok resembles a thoroughbred

## Hartebeest

in its carriage and posture. Neat and compact in build, it has a level back and a short, horselike neck. The general colour is greyish brown with a black stripe extending along the lower sides of the body.

The young gemsbok is born early in the year. At birth, the calf's horns are nearly one inch long, bent backwards, and knobbed at the points. The newborn calf's hue is a pale reddish grey, growing paler as the youngster increases in size. Its mother keeps it hidden in the bush for several months, until about the time the calf begins to change colour; then it is ready to join the herd with her.

The gemsbok is one kind of a group of antelopes known as oryxes. Other oryxes are much like their big relative the gemsbok. The **Beisa Oryx** and the **Fring-Ear Oryx** of East Africa have shorter horns than the gemsbok and lack the black flank stripes; otherwise the animals look much the same. The **White Oryx** inhabits the sun-baked deserts of North Africa. Its

horns are not straight, as in other oryxes, but curve strongly backwards. The animal is often hunted by the Arabs.

**The Addax**, *Addax nasomaculatus*, is a native of the desert regions of North Africa and the Egyptian Sudan. This remarkable animal can go for months without water to drink. It also changes its colour seasonally from sandy or brownish grey to reddish brown.

The addax is very much like the oryx in appearance, except for its horns and feet. Both sexes have horns, measuring some forty inches along the curve, but in the female they are more slender and less spirally twisted than in the male. Broad, spreading feet are adaptations for support on soft, sandy wastes. The addax associates in pairs or small herds and travels far over the desert in the wake of thunderstorms, which bring up quick growths of green vegetation.

## Deer Antelopes

### Hartebeests and their near relatives.

Society-loving creatures, hartebeests (the name is simply South African Dutch for "hart beasts") often associate in large herds in Africa. Preferring open plains and desert areas, where they seem to live almost independent of water, they feed exclusively on grasses, usually during daylight hours. The hartebeest is of such a timid and retiring nature that it rarely attempts to defend itself, even when attacked or wounded.

Among the fastest of the larger antelopes, hartebeests move with a heavy gallop when first startled. Then they gain high speed as the apparent stiffness in the joints disappears and they vanish in a cloud of dust. When grazing, hartebeests seem to post a sentinel on a large anthill, where it has an extensive view of the



## Blesbok

surrounding bush-covered veld. And well may they keep a careful lookout; their flesh is much relished by the natives and the lions.

The hartebeest dwells throughout most of Africa south of the Sahara. There are many kinds of hartebeest. The **Korrigum**, and its relatives the **Senegal Hartebeest** and the **Topi**, are fairly large antelopes with a dark, reddish-brown, narrow face. The **Bulal Hartebeest**, which stands about forty inches at the shoulder, has an abnormally long face. The **Kongoni**, one of the smaller hartebeests, is often seen in Kenya and Tanganyika. It is frequently shot for food. Both sexes of the hartebeest have ringed horns that are more or less lyre-shaped.

Rather rare today are the **Blesbok** and the **Bontebok**, beautiful antelopes with fine, glossy coats. Their faces are long and narrow, and atop them are rather short horns, heavily ringed and lyre-shaped, and curving slightly backwards. Formerly widely spread over the northern plains of the Cape Colony, the Orange Free State, and the Transvaal, these creatures were extensively hunted in the past, so that we do not find them in many parts of their native South Africa at present.

The bontebok (its name means "spotted buck" in Dutch) wears a purplish-red coat, and has a white face and rump. The Blesbok ("blaze buck") has a white blaze or spot on the forehead, but is otherwise not very different from the bontebok. Both are closely related to the **Sassaby**, a large antelope with short horns that spread upward and backward in a crescent-shaped curve, and all are cousins of the better-known hartebeest.

**The Black Wildebeest, or White-tailed Gnu**, *Connochaetes gnou*, with its long-faced, buffalo-like head, is not only

one of the queerest looking of the antelopes—it is a fascinating animal to observe as it moves speedily along the African veld. The wildebeests travel with a fast trotting pace, taking immense strides; they can keep this up for most of the day. Their call is curious, too—a loud, bellowing snort with a peculiar metallic ring.

When a herd is about to stop and have a look back, the leader, slowly cantering along, wheels around, followed by the herd in single file—but, not until the last one has made the turn does the leader give the signal to pull up.

When a troop of wildebeests stop to face an intruder, it is not uncommon to see a pair of bulls or cows drop to their knees and start sparring furiously with each other for a minute or two.

Despite its habit of travelling a considerable distance to forage for fresh pastures where the grass is green, the wildebeest tends to prefer a particular area. In all its wide range it has some spot where it goes the year round to rest during the warm midday hours. When feeding, the black wildebeest frequently kneels, a posture that few if any other animals assume.

The black wildebeest's name is not quite accurate, for it is dark brown—dark enough to be almost black. A fierce-looking creature, rather horselike in build, it measures four feet at the shoulder—it is the smallest of the gnus. It has a long, flowing, bushy white tail, and an erect mane on the neck.

The horns, unringed, are directed downward, then abruptly upward in front of the face. A tuft of hair on the nose adds to its queer appearance.

Once common on the flatlands of South Africa, the black wildebeest used to be heavily hunted for its skin and the animal has all but disappeared from the wild state. It is carefully preserved in the Cape

## Gazelle

open plains of central and eastern Africa north of the Zambesi River.

Wildebeests mate from June onward. The cows separate from the bulls when the calves are born eight and a half months later. Cows usually have one calf at a time.

Colony.

**The Brindled Gnu, or Blue Wildebeest,** *Gorgon taurinus*, travels in herds. Today it is a much commoner animal than the black wildebeest.

In general appearance a troop of brindled gnus resemble a herd of bison, from a distance at any rate, and the behaviour of both animals is very much alike. When stampeded, the gnus take off with a wild tossing of the head, combined with heel-kicking and tail-waving. At first they go into a fast trot, but after fifty yards or so they turn into an undulating gallop. There is much indignant snorting and grunting; their protests carry quite a distance.

In the long run the brindled gnu is one of the speediest animals—if not the fleetest of the lot—on the African veld. On the gallop it frequently travels in single file, often making a most spectacular picture along the skyline.

Cornered or hard pressed, the gnu will charge; still, it almost always stops short of its objective, trying to appear much more ferocious than it really is.

Brindled gnus travel in groups of anywhere from a dozen to several hundred animals. They frequent the open plains, where their favourite food is grass. Fast as these antelopes are, some authorities believe that a brindled gnu can be overtaken by an exceptionally fleet horse. Dependent on a regular supply of water, wildebeests migrate from one drinking place to another.

The brindled gnu is bigger than its black cousin—it measures four and a half feet at the shoulder, and weighs up to 550 pounds. Brindled in colour, this gnu has brown stripes on the neck and shoulders. Its tail is black. The smooth horns spread outwards instead of forward. This animal dwells for the most part on the

## Gazelles

**The Gazelle,** *Gazella*, is a slender, beautifully formed small antelope with high-tension muscles that can send it hurtling across the barren wilderness at an incredible speed. Although it is among our most comely and graceful animals



### Gazelle

**One of the largest group of antelopes.**

and lives in accessible and well-traversed regions, the gazelle has had surprisingly little mention in literature. No one seems to have made a detailed study of its life history.

The gazelle is at home in the hottest and driest parts of the Old World. It is a creature of the burning deserts, treeless

## Springbok

plains, and sandy wastes. That there is no water for miles and miles around, and not a vestige of shade in which to shelter from the torrid heat of the midsummer sun, does not inconvenience this lover of the great open spaces.

We find sixty or so different kinds of gazelles in southern Asia and northern Africa. Most of these creatures of the stony plains or deserts are comparatively small, not more than about two or three feet at the shoulder. For the most part they have lyre-shaped, ringed horns that curve backward and upward (they are generally larger in the male, and the females of a number of species lack them). Their coat is sandy brown in colour, which makes them inconspicuous in desert regions. In many cases, the animals have black and white bands on the face and flanks.

**The Gerenuk, or Waller's Gazelle,** *Litocranius walleri*, is noted for its ability to feed while standing on its hind legs. This it does frequently in order to reach the leaves on which it dines. It has a further adaptation for this form of eating—its extraordinarily lengthy slender neck, and legs that are very long for the size of its body.

The males carry twelve-inch horns that curve forward toward the tip and are heavily ringed. The general colour of the gerenuk is reddish brown, with a broad darker band down the middle of the back.

The typical gerenuk dwells in East Africa from Jubaland to Uganda and south to the Kilimanjaro district.

**The Goitered Gazelle,** *Gazella subgutturosa*, has a spectacular speed for an animal its size (about twenty-six inches at the shoulder). We have reason to suppose that in full flight the goitered gazelle can reach a speed of sixty miles

an hour. It can run at an average of thirty miles an hour for a distance of ten miles, and it can easily pull ahead of a car doing forty miles an hour.

The latter part of this animal's scientific name was derived from the swollen condition of the male's throat during mating time.

The goitered gazelle wears a coat of very dark cinchamon, but most of the head is white or buffy white, while the tail is black. Usually only the male has horns—they curve backward with an upward swing. As in most gazelles, the horns are ringed. The females are hornless, or almost so, with mere short stubs passing for horns.

The goitered gazelle is a desert-loving creature that associates in small herds. It has its home further north than any other of the typical gazelles. Its immense range extends from Asia Minor and the Caucasus through Russian Turkestan, Syria, Iran, and Afghanistan to the Altai Mountains and the Gobi Desert. Sometimes the animal is kept by the Arabs in tame herds.

**The Springbok,** *Antidorcas marsupialis*, derives its common name from its peculiar habit of leaping in the air at most unexpected times. It is gazellelike in general form, with perfect lyre-shaped horns that curve inward evenly at the tip.

This gazelle stands about thirty inches at the shoulder and weighs from seventy to eighty pounds. Especially noteworthy about it is a fold of skin which it has on its back. When alarmed, the animal turns the fold inside out, displaying an array of white hairs. These hairs probably serve as a warning signal.

There was a time when the graceful springbok gathered in immense herds on the plains of South Africa north to the Orange River. Thousands used to be seen

trekking in search of good forage but persistent hunting has greatly reduced the numbers and range of the animals.

**The Klipspringer**, *Oreotragus oreotragus*, is a mountaineer that invariably is found on rocky slopes in Africa from the Cape of Good Hope to Ethiopia. An alert little creature, continually on the lookout for enemies, it trusts rather to seeing its enemy first than to escaping detection. When it is not unduly alarmed or when its curiosity is aroused, the klipspringer will utter a shrill whistle.

When disturbed, the klipspringer always retreats uphill, taking what advantage it can of bush and rocky cover. Reaching the summit, it will pause, silhouetted against the skyline, for a final backward look. Against the rocks and bush its protective coloration makes the klipspringer almost imperceptible even when in full view.

The klipspringer's agility in its precipitous rocky home has earned for it the name of "African chamois." It can obtain a foothold on a rocky projection the size of a penny. When it is agitated, it fairly bounces up almost perpendicular cliffs like a rubber ball.

Though the klipspringer loves company, it is not gregarious; two or three often associate together, and sometimes as many as eight—but scarcely ever more—will maintain a group in a small area. They feed both by browsing on leaves and shoots of shrubs and by grazing on grass.

This dainty little animal is about twenty inches high at the shoulder. The horns of the bucks are ringed at the base and rise almost straight up from the head, bending only slightly forward. The females are generally hornless. As for the klipspringer's large, cylindrical hoofs, they are more like the feet of a mountain goat

than those of an antelope. The hair, too, is peculiar, being long and brittle, with a pithy structure resembling deer hair. The klipspringer's general body colour is yellowish brown speckled with yellow.

**The Oribi**, *Ourebia ourebi*, the swiftest of the smaller antelopes, is as much at home in the rolling foothills as it is on the plains.

Though the oribi wanders freely over the open plains, it is primarily a creature of tall grasses and bush country. Here it lies so close that it will almost permit itself to be stepped on, hoping to escape detection. When it does move, it goes with a tremendous rush, leaping in the air to see any danger that may be ahead.

A graceful creature, the oribi is yellowish brown in colour, and can generally be recognized by the long tufts or brushes on its knees. The male has straight, ringed horns, about six inches long, that project upright from the head.

In the bush, the oribi lives in twos and threes but on the open plains ten or twelve may be seen feeding together. Alarmed, they disperse in all directions—there is no unity in the group.

The oribi's range extends from South Africa to Ethiopia.

**The Steinbok**, *Raphicerus campestris*, is one of the few African game animals that have persisted over much of their ancient range despite the encroachment of man. It lives either singly or in pairs and is never sociable.

The steinbok, as a rule, favours open plains broken by scattered bush. Though it is at home on stony ground, it never takes to the mountains, nor has it been seen on steep hillsides. Passing the day hidden in tall grass, it comes out to feed during the evening and early morning hours. It is most conspicuous in the open spaces, where, for safety, it relies upon its

## Impala

ability to speed away. When hard pressed by dogs, however, it occasionally takes refuge in an aardvark burrow underground.

Not unlike the oribi in appearance, the steinbok has larger ears and a longer tail. Its body is sandy-reddish, with the head a darker shade; the shoulder height is about twenty-two inches and it weighs twenty-five pounds. Generally found on the plains of South Africa, the steinbok ranges north to the Transvaal and Kenya.

**The Impala, or Pallah,** *Aepyceros melampus*, is one of the most graceful of a race of graceful creatures. The cover in which the impala lives is sometimes dense; more often the animal sticks to parklike country, where it can feed in open glades. It always chooses a location where water is close at hand. During the heat of the day it rests in the shade of trees, usually lying down.

The impala is a great traveller; nomadic in habits, it usually travels along river courses. When a herd is alarmed, the animals bound off, sailing over the bushes and rocks with little apparent effort, and disappear in the recesses of the forest. In jumping, the impala seems to float through the air in graceful undulations very different from the springlike action of most antelopes.

For a limited distance the impala is perhaps the fleetest of all antelopes—not only does it bound over bushes and rocks, but often over its companions as well. One observer saw an impala cover a horizontal distance of seventy feet in three successive leaps—one leap alone measured thirty-five feet. The impala has been known to clear an eight-foot wire fence. It is easy to approach these unsuspecting creatures—unless they have become wary from frequent persecution.

An impala herd on the run presents a

graceful picture. Although the animals love company, they rarely gather in herds of more than fifty. Both sexes live together in the winter months, when the herds are at their largest. In the summer they travel far afield and live in scattered bands of one young male with fifteen or twenty ewes. He may have to fight for his harem from time to time, but is generally able to withstand the attacks of older bucks.

The impala's coat is reddish gold, the under parts are white. Only the bucks have horns—ringed and lyre-shaped, they measure fourteen to twenty inches in length. The animal stands about three feet at the shoulder and weighs up to 160 pounds. The impala, although often the victim of packs of wild dogs and other flesh-eaters, is still found throughout much of its former range in Kenya and Tanganyika, with a related form in south-west Africa and Angola.

**The Dibatag,** *Ammodorcas clarkei*, is also called Clarke's gazelle, after the Westerner who discovered it in 1890. This strange-looking antelope has a very long neck and legs and a thin, lengthy tail tipped with black. The animal stands three feet at the shoulder and wears a coat deep cinnamon in colour. It has white marking on its face.

A swift creature, the dibatag has a curious way of running. Neck and tail work like scissors when the dibatag speeds along: the head is repeatedly swung well back, then forward, and at the same time the tail is arched forward, then back. Apparently it was for this habit that the creature was named—dibatag means "tail raising" in Somali.

Only the male dibatag has horns—they measure about twelve inches in length and project upward and forward; ringed on the lower portion, they resemble the horns of a reedbuck.

The dibatag is a fairly rare antelope, living in small family groups among the parched sands of central Somaliland. It does not appear to require water, but depends upon plant food for its liquid.

Among the many species of gazelle, the following are representative of some of the other better known ones.

The **Addra Gazelle**, *Gazella dama*, also known as the *nanger*, *dania*, and *mhorr*, is the largest of the gazelles. It stands thirty-seven inches at the shoulder and has a longer neck than most gazelles, but its horns are rather short. Native to the desert regions of North Africa, it is easily recognized by the white rump patch which includes the tail. **Grant's Gazelle**, one of the larger varieties, is the best-known gazelle found in East Africa. An attractive creature, it stands thirty-three inches at the shoulder and weighs 150 pounds. Both sexes have long, handsome, lyre-shaped horns which measure about thirty inches in the male, only seventeen in the female. This animal ranges from Tanganyika north through Kenya and Ethiopia, and travels in herds. Often it is seen near water holes, in easy fellowship with other animals.

The **Goa** is a famous gazelle of the Asiatic plains, deserts and upland plateaus, where it sometimes falls victim to wolves.

The **Atlas Gazelle** is a small creature native to the higher ridges in Morocco,

Algeria, and Tunisia, where it is known as the *admi* or *edmi*. Another small antelope, the **Dorcas Gazelle**, occupies the hot deserts and barren wastes of Palestine and Syria as well as the burning sands of North Africa to the Sudan and Sahara.

The **Rhim** is the gazelle of the Libyan desert and the sand dunes of Algeria and the Sahara. Its colour is a very pale sandy, appearing almost white in the distance. The **Korin** is the **Red-fronted Gazelle** of Equatorial Africa, Senegal, the northern Cameroons, and the region of the Sudan. **Speke's Gazelle**, a native of Somaliland, is peculiar in that it has a flabby corrugated elevation on its nose. A gazelle fast approaching extinction is the **Red Gazelle** of the Algerian Sahara.

**Thomson's Gazelle**, a small, graceful animal with well-developed white facial markings and a narrow black band bordering the white on the sides of the rump, is familiar to every sportsman who visits Kenya and Tanganyika Territory. **Heuglin's Gazelle** is another variety with sharply defined flank stripes.

## Dwarf Antelopes

**The Royal Antelope**, *Nesotragus pygmaeus*, is not only the smallest antelope in Africa but one of the smallest hoofed mammals in the whole world. Only ten inches at the shoulder, it has horns less than one inch long. This pygmy lives in the forests of the West African coastal region from Liberia to Nigeria. It has a close relative in another pygmy antelope—the **Suni**, *Nesotragus moschatus*. This attractive little animal of the forests of East Africa stands just about a foot at the shoulder.

**The Dik-Dik**, a tiny slender antelope not much bigger than the royal antelope or the suni, is about fourteen inches at



Red-fronted Gazelle

## Blackbuck

the shoulder and weighs six or seven pounds. This handsome, harelike animal favours semi-arid brush country and, when disturbed, it bolts through the underbrush like a rabbit. Every year, thousands of dik-diks are captured in nets and killed for their skins, which are made into ladies' gloves. The animals are found in many parts of Africa.

Another interesting little creature is the **Somali Beira**, or **Beira Antelope**, a big-eared, greyish-fawn antelope with large feet bearing globular pads. Its shoulder height is about twenty inches, and it weighs in the neighbourhood of twenty pounds. Its spike horns are four inches long. Beiras are scarce, but they may be seen in twos or fours in the arid mountain regions in the interior of Somaliland and Ethiopia. When they hear a disturbing sound, they will often leap atop a high rock and try to see whether there is any cause for alarm. If there is, they are off in a flash.

## Blackbucks

**The Blackbuck, or Indian Antelope**, *Antelope cervicapra*, is the fastest of India's antelopes—it can leave a pair of greyhounds far behind. Credited with a speed of fifty miles an hour, this handsome antelope can be overtaken by a cheetah only in that animal's first lightning-swift burst of speed.

Open plains are the favourite haunts of the blackbuck. These abundant animals travel in herds generally numbering from ten to thirty; but we do have records of vast herds of several thousand of both sexes and all ages being seen together. The blackbuck never enters the forest or tall grass country. A grazing animal, it feeds on short grasses. Often it lives in regions where it is impossible to obtain water.



**Dik-Dik**

**A dwarf antelope found over much of West Africa that is extremely agile and can jump considerable distances.**

The blackbuck is readily distinguished from all other antelopes by its beautiful horns; ringed and spirally twisted, they spread out from the top of the head in the form of a broad V. The record horn length is twenty-nine inches. As a rule only males have horns—occasionally an old female will be the exception.

Adult bucks are black or blackish brown, while the females and young are reddish fawn in colour. Standing thirty-two inches at the shoulder, the blackbuck weighs about eighty-five pounds. This splendid creature is the only "true" antelope. It is the common medium-sized antelope of India. Few people realize that, strictly speaking, the blackbuck of India is the only true antelope in the world. The word "antelope", as a scientific name, is applied only to the blackbuck. As far as the early writers were concerned, it was *the antelope*—there were no others.

## Even-toed Hoofed Mammals: 9

### Goat Antelopes

The goat antelopes—the Rocky Mountain goat, the chamois, the musk ox, and their relatives—share in varying degrees the features which we find in goats and antelopes. Yet they are neither of these, and so we place them in a group by themselves.

Some of the goat antelopes enjoy living in more or less splendid isolation on remote mountain crags, at dizzying heights which sometimes range up to eighteen thousand feet. Others dwell in dense mountain

forests, also at considerable elevations.

The thick-haired hides of the goat antelopes protect them from the rigours of the freezing temperatures that prevail in their favourite haunts. And, too, their hoofs are generally adapted in some way to give them the extra-sure footing without which they would soon perish. The animals are cud-chewers, and belong in the same family (Bovidae) as the oxen, true antelopes, true goats, and the sheep.

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### Rock Goats and Gazelle Goats

**The Rocky Mountain Goat**, *Oreamnos americanus*, with its white coat and slender, backward-curving horns, looks for all the world like a true goat, yet it is a closer relative of Europe's chamois. A hardy creature, it is very much at home among the rugged cliffs and mountain peaks high above the timber line; not even the icy blasts of winter can induce it to seek the shelter of friendly woods.

From broken crags and treacherous mountain ledges the Rocky Mountain goat complacently views the world beneath. It never hastens its pace—in fact, it has no need of haste, for few natural enemies can follow the steep trail where the mountain goat picks its sure-footed way as it forages for the foliage, moss, lichens, and other plants on which it feeds.

We know little about the breeding habits of the mountain goat; humans seldom venture into its cold and bleak haunts during the breeding season in November. In April or May one or two kids come into the world. A kid born in captivity weighed seven and a half pounds

two days after birth, and measured thirteen and a half inches at the shoulder.

The "billies" or males are usually seen in twos and threes; if there are several goats in a group, they are generally "nannies" and kids. However, both parents may remain together while the young are very small; this is all to the good, as there is some danger that one of the babies may be stolen in an unguarded moment by a golden eagle.

The mountain goat is white except for the black hoofs and the ebony daggerlike horns, which measure ten inches in length. A stout-legged creature, the mountain goat has shoulders that are higher than the rump, giving it a hunched-back appearance. Some of the early pioneers referred to this shaggy creature as a small white mountain buffalo.

A full-grown male mountain goat stands between thirty-five and forty inches at the shoulder and weighs from 150 to 300 pounds. The females are smaller than the males, but both sexes are horned and bearded.

## Chiru

The home range of the mountain goat covers the peaks of western North America from central Washington State and Idaho northwest to southern Alaska.

### **The Chiru, or Tibetan Antelope,**

*Pantholops hodgsoni*, is native to the plateau of Tibet; here, at elevations of twelve thousand to eighteen thousand feet, this robust goat antelope wanders about on its sharp-pointed hoofs. As an adaptation to a cold climate, the chiru has a very thick, full coat of erect hair, pale fawn in colour, that is woolly next to the skin. The purpose of the peculiar swellings on each side of the animal's muzzle is not really understood.

The female chiru is hornless, but the buck has horns that are black and ringed. With a two-foot maximum length, the horns bend forward slightly and away from each other. When seen in profile, the chiru's horns suggest a one-horned animal; the chiru is classed as one of the creatures that may have given rise to belief in the fabled unicorn.



Saiga

The size of a small sheep, the saiga's coat turns white in winter.

The chiru keeps to the plains or open valleys, usually hiding during the day in hollows on the flats. Formerly groups of several hundred were not uncommon, but now herds consist of only a few animals. The chiru mates in winter, and a single baby is born six months later. Except during the mating season, the sexes live apart. The animal stands about thirty-two inches at the shoulder and weighs up to 120 pounds.

**The Saiga, *Saiga tatarica***, is the strangest looking of all the goat antelopes. This horned, sheeplike creature runs with lowered head, like a sheep or ox. Its enormously swollen nose strongly suggests the moose. It is thirty inches tall at the shoulder but has fairly short legs.

The saiga lives on alkali flats and vast stretches of open steppe country in central Asia, where it encounters severe dust and sand storms. As in the chiru, the many small hair-lined channels in the muzzle doubtless serve to filter the particles of dust and sand from the air which the animal breathes, and warm the air during the cold months. During the summer the harsh, thick hair is dull sandy-yellow in colour; in winter it becomes almost white, reminding us very much of a sheep's coat.

Only the male saiga bear horns. Slightly lyre shaped in form, ringed in front, and pale amber in colour, they are only about half as long as the chiru's.

Formerly the saiga ranged from Poland and the Kalmuck steppe of southern Russia to the Gobi Desert, and, in the early days, the Kirghiz tribesmen trained golden eagles to catch the saiga as well as the gazelle and the wolf. Today the saiga is more or less limited to the desolate wastes north of the Aral Sea, and a small herd exists under government protection on an island in the Aral Sea.

**The Goral**, *Naemorhedus*, which ranges from the Himalayas to eastern Siberia, is at home on grassy slopes as well as scrub forests and rocky mountainsides, at altitudes of three thousand to nine thousand feet.

This "chamois of Asia" is not so big as its European cousin. A stocky, goatlike animal (it stands twenty-eight inches at the shoulder and weighs about sixty pounds), the goral wears a coarse coat of grey or brown, and its short horns curve slightly to the rear. The animal is not easily seen in the tall grass. When alarmed, it makes a rather penetrating hissing noise which may be heard in places where there is no other sign of the goral's presence.

**The Serow**, *Capricornis sumatraensis*, is larger and stockier than the goral, often attaining a weight of two hundred pounds. To find this creature, you must make a stiff climb to the steep cliffs and rugged crags three thousand or more feet above the plains. In fact, the serow has been found at elevations of thirteen thousand feet.

Even after such an arduous climb, it is still far from easy to trace the serow. After days and days of stalking, a hunter may be rewarded by nothing more substantial than a loud, angry, shrill, whistling snort in the thick bush and a momentary flash of the beast as it makes off through the thickets, covering fifteen or twenty feet at a bound.

The Chinese native name for the serow is *Ngai lii-tze*, meaning "cliff donkey"—a reference to its long ears and love for rugged country. During the rutting season the rams have a habit of horning trees; this accounts for the smooth surface of the horns. Pursued by dogs, a ram will put up a terrific battle, unhesitatingly attacking man when cornered. The serow takes readily to water and can swim well.

More or less solitary in their habits, the serows generally frequent the forestlands on the mountain slopes of northern India, Burma, southern and western China, Formosa, and Japan. In some places they have reddish coats, in others blackish-brown.

**The Chamois, or Gems**, *Rupicapra rupicapra*, is a goatlike mountain dweller found high above the timber line. An elusive, swift-footed small creature, it is one of the most difficult of animals to come to close quarters with. It is with no small pride that the Swiss or Austrian hunter wears on his hat a tassel of hairs taken from the chamois.

A band of chamois, disturbed by hunters, need no path or ridge to follow. They skim like birds over wide ravines and dizzy peaks. Their dainty feet have cup-shaped depressions which enable the animals to shoot down rocky chimneys and come to rest on tiny ledges no bigger than a man's hand. In winter the chamois leaves the cold, bleak heights to take refuge in lowland woods and sheltered valleys.



**Goral**

This rock goat is found in mountains from the Himalayas to Korea.

## Takin

More slender than the sheep and the average goat, the chamois is easily recognized by its horns. Round and short, the horns rise perpendicularly from the head, and the tips are hooked abruptly backwards and downwards. Both males and females are horned.

In summer the chamois wears a coat that is soft tawny in colour; in winter it changes to blackish brown. Males are larger than females, and may reach a shoulder height of thirty-two inches, a weight of sixty-five pounds. Females weigh about forty-five pounds. Formerly the soft, pliant leather known as "shammy" was made from the hide of the chamois; today the sheep and the goat are the common source of this product.

Though the typical chamois dwells in the Alps, local varieties range west over the Apennines and east through the Carpathians and the northern parts of the Balkan peninsula to the Caucasus and Asia Minor.

## Ox Goats

**The Takin**, *Budorcas taxicolor*, is a rare animal, and little known. Living in exceedingly rough mountainous country from Bhutan to southern Shensi province in China at elevations of eight thousand to fourteen thousand feet, the takin makes elusive prey in the dense thickets of bamboo and brush that are its home.

From hunters we get a few interesting facts about the takin's habits. A heavy, clumsy animal, with a shaggy coat of yellowish hair, it spends the daytime in the thickets of rhododendron and bamboo near the timber line, leaving its shelter in the evening and early morning to graze on nearby grassy slopes. Breaking narrow trails through the bush, it follows them regularly to favourite feeding grounds and salt licks. To the Chinese, the animal is



**Donkey-eared Serow**

**One of the several species of sure-footed serows living in the Far East.**

*yeh niu*, meaning "wild cattle." They trap the takin for its flesh, using spear traps and snares. When the natives approach a herd they do so with great caution, claiming that if one beast is wounded, the rest will charge the hunter.

Very shy and secretive, the takin associates in small groups of two to eight. (A related species, the **Golden Takin**, travels in larger herds.) When alarmed, the takin gives a hoarse warning cough; but during the rut in July and August bulls utter a loud bellow. The calves are born in March, and three days after birth they are able to follow their mother around.

Seen from the side, the takin, with its curving horns, looks much like a wildebeest. It stands well over three feet at the shoulder, with front legs that are especially stout. A short face and thick muzzle are characteristic of the head, which the takin carries low, in oxlike fashion.

**The Musk Ox, Polar Ox, or Sheep Cow**, *Ovibos moschatus*, a native of the barren wastes of the American Arctic,

is not an ox at all, but a near relative of the takin of eastern Asia and the chamois of Europe. Although its legs are short, this robust, shaggy beast can gallop along at a fair speed, and in fact travels faster than a man; however, a dog can easily overtake a musk ox.

Herds of twenty or thirty musk oxen, chiefly cows and calves, are by no means unusual. The musk ox is one of the few animals that will join forces to combat a common foe. It would be useless for the animals to attempt to scatter and run away from a pack of swift Arctic wolves. By uniting in a circle with the calves safely inside, the musk oxen present an impregnable front to the enemy. Still it is not always possible to maintain an unbroken defensive position; sometimes three or four bulls will charge in unison in an effort to smash an attack.

With its back to a cliff and its two-foot-long horns ready for action, a single musk ox can protect itself from a whole pack of dogs or wolves.

Somewhat resembling a shaggy domestic bull in appearance, the musk ox is clothed in long, flowing chocolate-brown hair that falls almost to the fetlocks. A thick growth of wool underlies the heavy outer covering of hair and serves as an impenetrable blanket against subzero Arctic temperature. Broad-spreading main hoofs and well-developed side hoofs have hair between them to facilitate progress on slippery ice or frozen snow. The tail is small and almost lost in the long hair of the rump.

Both sexes have horns—massive structures that cover the head like a shield. Broad at the base and arising close together on top of the head, the horns

curve downward along the side of the face behind the eyes, then upward to a sharply tapered point. The adult male is larger than the female—he generally measures about four feet at the shoulder, and weighs from seven hundred to nine hundred pounds.

In its frigid homeland, the musk ox roams far beyond the northern timber line. Its range extends from the coastal regions of northern Greenland south to the Thelon River, in north-eastern Canada, including the adjoining Arctic islands. There are three named geographical forms: the **Black-faced Musk Ox**, the **Hudson Bay Musk Ox**, and the **White-faced Musk Ox**. The animal was once much preyed upon by the Eskimos, but now enjoys protection in Canada.

The musk ox does not have specialized musk glands, but there is a noticeably musky odour about the animal during the rutting season, and the flesh has a decidedly musky taste.

Mating takes place between July and September, probably from late July into early August. Although the calves are usually born about May, some come as late as July and others early in March. One calf at a time is common, although occasionally twins are born. A newborn calf stands eighteen inches at the shoulder and weighs sixteen pounds.

The musk ox feeds on grass, moss, and any other edible plants, including shoots of willows and even branches of scrub pine trees. In summer, luxuriant grass grows knee deep on the barrens. Food is plentiful, and the musk ox waxes fat and contented, but in wintertime it must dig out a sparse livelihood of mosses and dead grass from under the driven snow.

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## Even-toed Hoofed Mammals: 10

# Wild Goats and Sheep

It is not always an easy matter to tell the goats from the sheep in the wild. Both are mountain creatures, dwelling in the high places of the earth. Both are chewers of the cud, wear hairy coats, and possess hollow horns. But, although we may occasionally confuse a number of these creatures, there are some marked ways in which sheep and goats differ.

The wild goat is generally a more sure-footed and adventurous animal than the wild sheep. It can live off the coarsest of food. Although it may browse and graze on grassy slopes, it will, after eating, retreat to a high crag for safety and slumber. The goat's horns are directed back-

ward and upward, while the sheep's horns are usually spirally curved. Most male goats have a distinct beard and a strong goaty odour. Both sheep and goats were domesticated before 3,000 B.C., and probably much earlier than cattle.

Wild goats are restricted to Europe, Central Asia, and North Africa. We find the wild sheep in the Northern Hemisphere, including North Africa. (Goats and sheep form a subfamily of the Bovidae.) The Rocky Mountain Bighorn Sheep, the most spectacular animal of the American group, is not entirely a creature of the New World; close relatives do occur in Siberia.

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## True Goats

**The Ibex**, *Capra*, a native of Asia, North Africa, and Europe, is a common wild goat of the Old World. It dwells in the vicinity of precipitous cliffs and mountain crags at high elevations close to the snow line at all seasons of the year. Even in winter it does not resort to the shelter of timber; instead, it haunts steep hillsides where the snow is not deep.

The ibex has acute senses of sight, hearing and smell. Usually one animal seems to act as a lone sentry, keeping watch for possible danger. It utters a shrill warning whistle to alert its fellows at the slightest suspicion of anything untoward. Extremely agile and sure footed, the ibex can leap down a forty-foot precipice to a rocky ledge below.

October is the mating season, when the males descend from their lofty pinnacles and join the females. Both sexes herd

together at this time of the year but disperse when the snow melts in the spring. The males retreat to the more inaccessible mountain crests, while the females remain behind to give birth to their one or two offspring during May or June.

The ibex is the typical bearded goat. Its enormous horns (they measure up to fifty-eight inches) rise close together on top of the head and sweep back in a wide, even arc, like the blade of a scimitar. In the true ibex the horns are heavily corrugated on the broad front. The animal has a coat of rather long loose hair, usually yellowish brown in colour.

Among the many kinds of these hardy animals, the **Siberian Ibex**, *Capra sibirica*, is the largest and most handsome; it is native to the mountains of central Asia, the Tien Shan, Altai, and the Himalayas.

The **Abyssinian Ibex** is a stocky, heavily built species with short, stout horns, while the **Nubian Ibex** from upper Egypt, Arabia, Palestine, and upper Nubia can be recognized by its long, slender horns.

The **European Ibex** or **Steinbok** is now extinct in the wild. It formerly ranged in the higher Alps of Switzerland, Savoy and the Tyrol. A few still survive under protection on the Italian side of Monte Rosa. This animal is easily tamed but remains forever capricious—a word, we might remember, that was originally applied to the goat.

**The Chetan Ibex, Pasang, or Wild Goat**, *Capra hircus*, is the source of bezoar, once famous as a reputed antidote for poison. To this day bezoar is still regarded in Iran as a remedy for many diseases. The substance is secreted in the stomach of the pasang, which is why the great systematizer Linnaeus called this goat *Capra bezoartica*.

The domestic goat is a lineal descendant of the pasang, which roams in herds over barren, rocky hills. The pasang has the peculiar habit of selecting the narrowest of pinnacles on which to balance itself. This goat dwells in a territory that ranges from south-eastern Europe to south-western Asia, and includes the neighbouring islands.

The **Spanish Wild Goat**, *Capra pyrenaica*, used to be found throughout the mountains of the Iberian peninsula and is still plentiful in some parts of its former range. It is often referred to as the **Pyrenean Ibex**. The horns are of the wild goat type, compressed and having a sharp inner edge in front instead of being broad and knotty as are those of the ibex.

**The Eastern Tur, or Caucasian Bharal**, *Capra caucasica*, is a robust and

handsome wild goat with comparatively smooth, short horns which curve outward and backward close to the neck. One form, **Pallas's Tur**, which also lives in the Caucasus Mountains, is closely related to the Asiatic Blue Sheep, or Himalayan Bharal, mentioned later. Thus Pallas's tur is in effect a connecting link between the sheep and the goats, but it is a goat and not a sheep.

**The Western Tur**, native to the western half of the main Caucasian range, while still a wild goat, has heavy bosses in front of the horns like a true ibex, but the horns are shorter, heavier and not so evenly arched. The turs like to spend their time on lofty precipices above the snow line.

**The Himalayan Tahr**, *Hemitragus jemlaicus*, is a beardless goat with short, evenly curved horns, that lives at high elevations in the Himalayas. Here it runs in herds of five to about twenty-five, among the crags and rocky precipices near the timber line; old males may even enter thick timber. The tahrs are wary, sharp sighted and, like all goats, nimble on a steep terrain.

Though the Himalayan tahr is rather sociable, the sexes normally live apart except during the mating season. Six months after mating, the female produces one kid. Other kinds of tahr dwell in the hills of southern India and south-eastern Arabia.

**The Markhor**, *Capra falconeri*, has long, shaggy hair, and in old males the beard extends from the chin down the underside of the throat. This wild goat follows along the margin between deep forest and higher snow-capped peaks where the tumbled rocks and steep cliffs are hidden by the last stand of woodland growth. It rarely

## Bighorn Sheep

comes out on open mountain slopes or bare crags above the timber line.

The domain of the markhor extends from Kashmir in India through Baluchistan to Afghanistan. There are five named forms, including the Astor Markhor and Punjab Markhor, that have long, spirally twisted horns. Famed as a hunter's trophy, they come out close together on top of the head and may curl in a wide, open spiral like a corkscrew or straight with two keels winding round and round like a screw. The **Himalayan Markhor** is the biggest of the wild goats—it may stand over forty inches high and weigh more than two hundred pounds.

## Wild Sheep

**The Rocky Mountain Bighorn Sheep**, *Ovis canadensis*, does not conform to our conventional notions about sheep. There are several kinds of bighorns, but this is the typical bighorn, the best known, the largest, and the one with the widest distribution.

Though goats are excellent climbers, they by no means match the bounding swiftness of bighorn sheep. The feet of the bighorn are equipped with soft elastic pads that absorb the shocks of a bouncing gait and also provide an effective grip on hard, rough, or slippery surfaces.

There are few cliffs that bighorns cannot surmount—not carefully and step by step like a mountain goat, but at a seemingly needless and breakneck gallop.

A full-grown bighorn may average forty inches in shoulder height. Its weight may range from 175 to 350 pounds. The horns of mature rams often form more than one full turn, the record length being a trifle short of fifty inches. Ewes have smaller, compressed horns seldom exceeding fifteen inches in length.

The bighorn's summer coat is dark (or

greyish) brown; its winter covering is lighter and greyer. The hair, like that of other wild sheep, is not woolly as in domestic sheep; instead, it is long, coarse, and full, like a deer's.

Mountain sheep are herd animals, but the males and females do not mix except for a brief period in December during the mating season. At this time the rams vie fiercely with one another for possession of the ewes. They indulge in none of the pre-battle antics typical of moose, or other horned beasts; they do not trumpet defiance at each other or roar challenging cries to combat. Instead, they settle down to serious fighting with little preliminary skirmishing.

By January the mating season is over, and the rams calmly resume their bachelor ways. Even though they meet a flock of ewes, the males now pass them by indifferently, preferring the companionship of their own sex.

The lambs, usually two to a female, are born in late May or June. At first the mothers hide them and lick them; "owning" the lamb, as it is called, is a ritual never omitted. Before the day is out, the young are skipping about, following their mother, and are soon ready to join the herd.

The ewes and their yearling lambs associate in small flocks rarely numbering more than twenty head. The herd leader is a wise, portly ewe, the grandmother of much of the flock but still young enough to bear offspring annually. She keeps constant watch over her charges, since the safety of the entire group depends on her judgment and guidance.

The bighorns range from southern British Columbia to north-western Chihuahua, Mexico, and are also found in eastern Siberia.

**The Himalayan Bharal, or Blue**

**Sheep**, *Pseudois nayaur*, while definitely not a goat, has the markings and horns of one, though it lacks the strong, disagreeable odour of the typical goat. The blue sheep dwells among the heights of the mountain ranges of central Asia from Tibet to western China. In summer it may be found at elevations of seventeen thousand feet, and even in winter it probably never descends below ten thousand feet.

**The Aoudad, or Barbary Sheep**, *Ammotragus lervia*, is also known as the Udad, Audad, Arui, Fechstal, and Maned Sheep. It is the only wild sheep found in Africa and may be recognized by its uniform tawny colour and the fringe of long hair hanging from its throat, chest, and the upper parts of its forelegs. It has a longer tail than other wild sheep. There are seven varieties of aoudad. The animal stands over three feet at the shoulder, and its horns may be thirty inches long.

This big sheep lives in small family groups, except for the rams, which are more or less solitary outside the breeding season. The animal is at home in the Atlas Mountains and the Aures that fringe the Sahara Desert. It often is seen on isolated outcrops of rock that jut out of the burning desert and even on arid, level ground almost destitute of vegetation and water.

**The Mouflon**, *Ovis musimon*, is one of the very few wild sheep in Europe. It is a native of the mountains of Sardinia and Corsica, but has been introduced into Hungary, Austria, Czechoslovakia, and other countries. It is a rather small species, reddish brown in colour with a whitish saddle in winter. The ewes usually, but not always, have horns.

**The Red Sheep, or Gmelin's Sheep**,

*Ovis orientalis*, is yellow or fox-red in summer and brownish in winter, with a grey saddle patch. The horns are not unlike those of the mouflon, but usually curve more sharply backward and terminate behind the head. There are several species of red sheep that inhabit the arid rocky mountain ridges of Asia Minor, the Caucasus, Persia and Cyprus.

**The Urial, Gad or Shapo**, *Ovis vignei*, is also known as the Oorial or Sha. It has an extensive range and is spread over the mountains of northwest India through Afghanistan to Transcaspia, Turkestan, and Russia. This is a variously coloured sheep but usually it is reddish brown. The males have long, slender horns that form a large, open curl.

While it is generally conceded that most of our domestic sheep were derived from the red sheep, the mouflon and the urial can not be entirely excluded as possible ancestors.



Mouflon



Common Otter

# Check List

The page references below refer to species printed in bold type in the text.

|          |                               |           |
|----------|-------------------------------|-----------|
| <b>A</b> | Aardwolf                      | 82        |
|          | Abyssinian ibex               | 197       |
|          | Addax                         | 183       |
|          | Addra gazelle                 | 189       |
|          | African black rhinoceros      | 129-30    |
|          | African bush pig              | 135-6     |
|          | African civet                 | 75-6      |
|          | African linsang               | 75        |
|          | African long-eared fox        | 34        |
|          | African manatee               | 113       |
|          | African water chevrotain      | 144       |
|          | African wild cat              | 84        |
|          | African wild donkey           | 124       |
|          | Alaska fur seal               | 99-101    |
|          | Alaskan moose                 | 158       |
|          | Alpaca                        | 142       |
|          | American badger               | 66-7      |
|          | American bison                | 170-1     |
|          | American black bear           | 39-40, 42 |
|          | American mink                 | 58        |
|          | American pine marten          | 61        |
|          | Andean deer                   | 156-7     |
|          | Andean highland cat           | 87        |
|          | Andean wolf                   | 35        |
|          | Antarctic "wolf"              | 35        |
|          | Antelopes                     | 173-190   |
|          | Aoudad                        | 199       |
|          | Arabian camel                 | 142       |
|          | Arctic fox                    | 29-31     |
|          | Asiatic buffalo               | 166-7     |
|          | Asiatic elephant              | 118-9     |
|          | Asiatic palm civet            | 76        |
|          | Asiatic two-horned rhinoceros | 132       |

|                     |       |
|---------------------|-------|
| Asses               | 124-5 |
| Atlantic walrus     | 104   |
| Atlas gazelle       | 189   |
| Aurochs             | 166   |
| Australian sea lion | 102   |
| Axis deer           | 148-9 |

|          |                       |       |
|----------|-----------------------|-------|
| <b>B</b> | Babiroussa            | 135   |
|          | Bactrian camel        | 141   |
|          | Badgers               | 64-7  |
|          | Baird's whale         | 6     |
|          | Banded linsang        | 74    |
|          | Banded mongoose       | 78    |
|          | Banting               | 169   |
|          | Barasingha            | 150   |
|          | Barbary sheep         | 199   |
|          | Barking deer          | 147   |
|          | Barren-ground caribou | 159   |
|          | Bay lynx              | 88    |
|          | Bearded seal          | 107-8 |
|          | Bears                 | 38-46 |
|          | Beech marten          | 61    |
|          | Beira antelope        | 190   |
|          | Beisa oryx            | 183   |
|          | Beluga                | 7-8   |
|          | Bengal tiger          | 95-6  |
|          | Big-toothed hyrax     | 121   |
|          | Binturong             | 76    |
|          | Bison                 | 170-2 |
|          | Black-backed jackal   | 29    |
|          | Blackbuck             | 190   |
|          | Black-faced musk ox   | 195   |
|          | Blackfish             | 12-3  |
|          | Black-footed cat      | 85    |
|          | Black-footed ferret   | 59    |
|          | Black wildebeest      | 184   |
|          | Blesbok               | 184   |
|          | Blotched giraffe      | 162   |
|          | Blue bear             | 40    |

|          |                       |        |
|----------|-----------------------|--------|
| <b>B</b> | Blue bull             | 178    |
|          | Blue sheep            | 198-9  |
|          | Blue whale            | 19-20  |
|          | Blue wildebeest       | 185    |
|          | Boars                 | 134-5  |
|          | Bobcat                | 88     |
|          | Bohor reedbuck        | 181    |
|          | Bongo                 | 177-8  |
|          | Bontebok              | 184    |
|          | Bontequagga           | 125-6  |
|          | Bottle-nosed dolphin  | 13     |
|          | Bottle-nosed whale    | 6-7    |
|          | Bowhead               | 21     |
|          | Brindled gnu          | 185    |
|          | Broad-horned antelope | 177-8  |
|          | Brocket               | 156    |
|          | Brow-antlered deer    | 150    |
|          | Brown hyena           | 81-2   |
|          | Bruang                | 43-4   |
|          | Brush wolf            | 26-7   |
|          | Bubal hartebeest      | 184    |
|          | Buffaloes             | 166-72 |
|          | Buffoon's kob         | 180    |
|          | Burchell's rhinoceros | 130-1  |
|          | Burchell's zebra      | 125-6  |
|          | Bushbuck              | 175-6  |
|          | Bush dog              | 35-6   |
|          | Bush duiker           | 179    |
|          | Bush elephant         | 116-7  |

|          |                     |        |
|----------|---------------------|--------|
| <b>C</b> | Caaing whale        | 12-3   |
|          | Cachalot            | 4-6    |
|          | Cacomistle          | 48-9   |
|          | California sea lion | 101    |
|          | Camels              | 140-2  |
|          | Canadian lynx       | 87-8   |
|          | Cape buffalo        | 170    |
|          | Cape hunting dog    | 36-7   |
|          | Carabão             | 166-7  |
|          | Cañacal             | 89     |
|          | Cariacu             | 156    |
|          | Caribou             | 158-61 |
|          | "cat bear"          | 52     |

|          |                            |        |
|----------|----------------------------|--------|
| <b>C</b> | Cats                       | 83-97  |
|          | Cattle                     | 165-70 |
|          | Caucasian bharal           | 197    |
|          | Caucasian tiger            | 96     |
|          | Celebes anoa               | 167    |
|          | Celebes pig deer           | 135    |
|          | Central American tapir     | 127    |
|          | Chama                      | 34     |
|          | Chamois                    | 193-4  |
|          | Cheetah                    | 97     |
|          | Chetan ibex                | 197    |
|          | Chevrotains                | 144    |
|          | Chilean pudu               | 157    |
|          | Chilla                     | 35     |
|          | Chinese river dolphin      | 15     |
|          | Chinese water deer         | 147    |
|          | Chiru                      | 192    |
|          | Chital                     | 148-50 |
|          | Civets                     | 75-6   |
|          | Clawless otter             | 72     |
|          | Clouded leopard            | 91-2   |
|          | Coati                      | 49-50  |
|          | Collared peccary           | 137    |
|          | Columbia black-tailed deer | 156    |
|          | Common black bear          | 40     |
|          | Common dolphin             | 10-11  |
|          | Common duiker              | 179    |
|          | Common eland               | 177    |
|          | Common finback whale       | 17-8   |
|          | Common hippopotamus        | 138-9  |
|          | Common mongoose            | 77-8   |
|          | Common otter               | 70-1   |
|          | Common polecat             | 58-9   |
|          | Common waterbuck           | 179-80 |
|          | Corsac fox                 | 34     |
|          | Cougar                     | 89-90  |
|          | Coyote                     | 26-7   |

Crab-eating mongoose 78  
Crab-eating raccoon 48  
Crab-eating seal 110  
Crested genet 74  
Crested wild boar 135  
Culpeo 35  
Cuvier's whale 6

**D** Dall's porpoise 15  
Deer 145-157, 161  
Defassa 179  
Derby's eland 177  
Desert cat 86  
Dholes 36  
Dibatag 188-9  
Dik-dik 189-90  
Dingo 27-8  
Dolphins 10-15  
Donkey 123  
Dorcas gazelle 189  
Dugong 111-2  
Duikers 178-9  
Dwarf caribou 159-60  
Dwarf forest buffalo 170  
Dwarf mongoose 78  
Dwarf white-tailed deer 155

**E** Eastern tur 197  
Egyptian fettered cat 84  
Elands 176-7  
Eld's deer 150  
Elephants 114-9  
Elephant seal 108-9  
Elk 152-3, 157-8  
Ermine 53-5  
Eurasian badger 64-6  
Eurasian wild boar 134-5  
European bison 171-2  
European brown bear 43

**E** European genet 74  
European ibex 197  
European lynx 88-9  
European mink 58  
European wild cat 84  
Eyra 86-7

**F** Falanouc 76-7  
Fallow deer 147-8  
False killer whale 12  
Fennec fox 34  
Ferrets 59  
Finback whale 17-8  
Finless black porpoise 15  
Fisher 61-2  
Fishing cat 86  
Fitch 58-9  
Flat-headed cat 86  
Flat-tailed otter 72  
Florida manatee 113  
Forest elephant 117-8  
Fossa 79  
Four-horned antelope 178  
Foussa 77  
Foxes 29-35  
Fring-ear oryx 183

**G** Gad 199  
Ganges River dolphin 14-5  
Gaur 169  
Gayal 169  
Gazelles 185-9  
Gems 193-4  
Gemsbok 182-3  
Genets 73-4  
Geoffroy's spotted cat 87  
Gerenuk 186  
Giant African otter 72  
Giant eland 177  
Giant forest hog 136  
Giant otter 72

|          |                         |        |
|----------|-------------------------|--------|
| <b>G</b> | Giant panda             | 51-2   |
|          | Giraffes                | 162-5  |
|          | Glacier bear            | 40     |
|          | Gmelin's sheep          | 199    |
|          | Gnu                     | 184-5  |
|          | Goa                     | 189    |
|          | Goat antelopes          | 191-4  |
|          | Goats                   | 196-8  |
|          | Goitered gazelle        | 186    |
|          | Golden cash leopard     | 90-2   |
|          | Golden cat              | 86     |
|          | Goose-beaked whale      | 6      |
|          | Goral                   | 193    |
|          | Grant's gazelle         | 189    |
|          | Greater kudu            | 174    |
|          | Great Indian rhinoceros | 131    |
|          | Greenland caribou       | 159    |
|          | Greenland seal          | 105-6  |
|          | Grevy's zebra           | 125    |
|          | Grey fox                | 32-3   |
|          | Grey hyrax              | 120    |
|          | Grey jackal             | 29     |
|          | Grey mongoose           | 78     |
|          | Grey ox                 | 169-70 |
|          | Grey rhebok             | 181    |
|          | Grey seal               | 106-7  |
|          | Grey whale              | 16-7   |
|          | Grey wild cat           | 84     |
|          | Grey wolf               | 23-5   |
|          | Grison                  | 62-3   |
|          | Grizzly bear            | 41     |
|          | Grunting ox             | 168-9  |
|          | Guanaco                 | 142-3  |
|          | Guepard                 | 97     |

|          |                    |       |
|----------|--------------------|-------|
| <b>H</b> | Hairy-nosed otter  | 72    |
|          | Halicore           | 111-2 |
|          | Hangul stag        | 152   |
|          | Harbour porpoise   | 15    |
|          | Harbour seal       | 104-5 |
|          | Harnessed antelope | 175-6 |
|          | Harp seal          | 105-6 |

|          |                        |        |
|----------|------------------------|--------|
| <b>H</b> | Hartebeests            | 183-4  |
|          | Heirie                 | 142    |
|          | Heuglin's gazelle      | 189    |
|          | Himalayan bharal       | 198-9  |
|          | Himalayan jackal       | 29     |
|          | Himalayan markhor      | 198    |
|          | Himalayan tahr         | 197    |
|          | Hippopotamuses         | 137-40 |
|          | Hog badger             | 67     |
|          | Hog-nosed skunk        | 67, 69 |
|          | "Honey bear"           | 50-1   |
|          | Hooded seal            | 110    |
|          | Hooker's sea lion      | 102    |
|          | Hook-lipped rhinoceros | 129-30 |
|          | Horses                 | 121-3  |
|          | Huanaco                | 142-3  |
|          | Hudson bay musk ox     | 195    |
|          | Hudson bay sable       | 61     |
|          | Huemul                 | 156-7  |
|          | Humpback whale         | 18-9   |
|          | Humped cattle          | 167-8  |
|          | Hunting leopard        | 97     |
|          | Huron                  | 62-3   |
|          | Hyenas                 | 79-82  |
|          | Hyraxes                | 120-1  |

|          |                        |        |
|----------|------------------------|--------|
| <b>I</b> | Ibex                   | 196-7  |
|          | Ichneumon              | 78     |
|          | Impala                 | 188    |
|          | Indian antelope        | 190    |
|          | Indian boar            | 135    |
|          | Indian chevon          | 144    |
|          | Indian elephant        | 118-9  |
|          | Indian mongoose        | 78     |
|          | Indian swamp deer      | 150    |
|          | Indian tiger           | 95-6   |
|          | Indo-chinese forest ox | 169-70 |
|          | Irrawaddy dolphin      | 14     |

|          |                              |         |
|----------|------------------------------|---------|
|          | Island white bear            | 40      |
| <b>J</b> | Jackals                      | 28-9    |
|          | Jaguar                       | 96-7    |
|          | Japanese sea lion            | 102     |
|          | Javan rhinoceros             | 131-2   |
|          | Javeline                     | 137     |
|          | Jungle cat                   | 84      |
|          | Jungle sheep                 | 147     |
| <b>K</b> | Kaffir cat                   | 84      |
|          | Kermode's bear               | 40      |
|          | Kiang                        | 124-5   |
|          | Killer whale                 | 11-12   |
|          | Kinkajou                     | 50-1    |
|          | Kit fox                      | 33-4    |
|          | Klipspringer                 | 187     |
|          | Kobs                         | 180     |
|          | Kodiak bear                  | 42-3    |
|          | Kolinsky                     | 57      |
|          | Kongoni                      | 184     |
|          | Korin                        | 189     |
|          | Korrigum                     | 184     |
|          | Kouprey                      | 169-70  |
|          | Kudus                        | 174     |
| <b>L</b> | La Plata dolphin             | 15      |
|          | Large spotted serval         | 86      |
|          | Laughing hyena               | 80-1    |
|          | Lechwes                      | 180-1   |
|          | Leopard                      | 90-2    |
|          | Leopard genet                | 74      |
|          | Leopard seal                 | 99, 108 |
|          | Lesser kudu                  | 174     |
|          | Lesser one horned rhinoceros | 131-2   |
|          | Lesser panda                 | 52      |
|          | Lingsangs                    | 74-5    |
|          | Lion                         | 92-4    |
|          | Little piked whale           | 18      |
|          | Llama                        | 142     |
|          | Long-tailed weasel           | 55-6    |
|          | Lynxes                       | 87-9    |

|          |                       |        |
|----------|-----------------------|--------|
| <b>M</b> | Malay tapir           | 127    |
|          | Mampalon              | 76     |
|          | Manatees              | 112-3  |
|          | Manchurian grizzly    | 43     |
|          | Maral stag            | 152    |
|          | Marbled cat           | 86     |
|          | Margay                | 87     |
|          | Markhor               | 197-8  |
|          | Marsh buck            | 175    |
|          | Marsh deer            | 157    |
|          | Marsh mongoose        | 78     |
|          | Martens               | 60-1   |
|          | Mecheri               | 141    |
|          | Milu                  | 153-4  |
|          | Mink                  | 57-8   |
|          | Mithan                | 169    |
|          | Mouflon               | 199    |
|          | Mongolian wild ass    | 124    |
|          | Mongoose              | 77-8   |
|          | Monk seal             | 110    |
|          | Moon bear             | 42     |
|          | Moose                 | 157-8  |
|          | Mountain tapir        | 127    |
|          | Mule                  | 124    |
|          | Mule deer             | 155    |
|          | Muntjak               | 147    |
|          | Musk deer             | 146-7  |
|          | Musk hog              | 137    |
|          | Musk ox               | 194-5  |
| <b>N</b> | Narwhal               | 8-10   |
|          | Natrerer's manatee    | 113    |
|          | Natted giraffe        | 162    |
|          | Nile lechwe           | 180-1  |
|          | Nilgai                | 178    |
|          | North American otter  | 70     |
|          | Northern fur seal     | 99-101 |
|          | Northern sea cow      | 112    |
|          | Northern sea elephant | 109-10 |
|          | Northern sea lion     | 101-2  |
|          | Nubian ibex           | 197    |

|          |                          |        |
|----------|--------------------------|--------|
|          | Nyala                    | 176    |
| <b>O</b> | Ocelot                   | 85     |
|          | Okapi                    | 164-5  |
|          | Old world caribou        | 160-1  |
|          | Olingo                   | 51     |
|          | Onager                   | 124    |
|          | One-horned rhinoceros    | 131    |
|          | Oribi                    | 187    |
|          | Otter civet              | 76     |
|          | Otters                   | 70-2   |
|          | Oxen                     | 165-70 |
|          | Ox goats                 | 194-5  |
| <b>P</b> | Pacific walrus           | 104    |
|          | Pallah                   | 188    |
|          | Pallas's tur             | 197    |
|          | Pampas cat               | 87     |
|          | Pampas deer              | 157    |
|          | Pampas fox               | 35     |
|          | Panolia deer             | 150    |
|          | Panther                  | 90-2   |
|          | Pasang                   | 197    |
|          | Peccaries                | 136-7  |
|          | Père David's deer        | 153-4  |
|          | Persian wild ass         | 124    |
|          | Philippine pygmy buffalo | 167    |
|          | Pigs                     | 133-6  |
|          | Pilot whale              | 12-13  |
|          | Pinchaque                | 127    |
|          | Pine marten              | 61     |
|          | Plains buffalo           | 170-1  |
|          | Polar bear               | 44-5   |
|          | Polar ox                 | 194-5  |
|          | Porpoises                | 15     |
|          | Prairie wolf             | 26-7   |
|          | Pronghorns               | 172-3  |
|          | Przewalski's horse       | 123    |
|          | Puku                     | 180    |
|          | Puma                     | 89-90  |
|          | Pygmy buffalo            | 167    |

|          |                              |        |
|----------|------------------------------|--------|
| <b>P</b> | Pygmy hippopotamus           | 139-40 |
|          | Pygmy sperm whale            | 6      |
|          | Pygmy weasel                 | 56-7   |
|          | Pyrenean ibex                | 197    |
| <b>Q</b> | Quagga                       | 126    |
|          | Quiqui                       | 62-3   |
| <b>R</b> | Raccoon                      | 46-8   |
|          | Raccoon dog                  | 34-5   |
|          | Rasse                        | 75     |
|          | Ratel                        | 67     |
|          | Red deer                     | 150-2  |
|          | Red fox                      | 31-2   |
|          | Red-fronted gazelle          | 189    |
|          | Red gazelle                  | 189    |
|          | Red hog-deer                 | 147    |
|          | Red lechwe                   | 180    |
|          | Red river hog                | 135-6  |
|          | Red sheep                    | 199    |
|          | Red wolf                     | 25, 35 |
|          | Reedbucks                    | 181    |
|          | Reindeer                     | 158-61 |
|          | Reticulated giraffe          | 162    |
|          | Rhim                         | 189    |
|          | Rhinoceroses                 | 128-32 |
|          | Ribbon seal                  | 110    |
|          | Rib-faced deer               | 147    |
|          | Right whales                 | 20-1   |
|          | Ringed seal                  | 105    |
|          | Risso's dolphin              | 13     |
|          | Roan antelope                | 182    |
|          | Rock hyrax                   | 120    |
|          | Rocky mountain bighorn sheep | 198    |
|          | Rocky mountain goat          | 191-2  |
|          | Ro deer                      | 161    |
|          | Rorqual                      | 17-18  |
|          | Ross seal                    | 110    |
|          | Royal antelope               | 189    |
|          | Rudolphi's rorqual           | 18     |
|          | Rusine deer                  | 149    |

|                          |                |  |  |
|--------------------------|----------------|--|--|
| Russian sable            | 60-1           |  |  |
| Rusty spotted cat        | 86             |  |  |
| <b>S</b>                 |                |  |  |
| Sable antelope           | 181-2          |  |  |
| Sables                   | 60-1           |  |  |
| Saddle-backed seal       |                |  |  |
|                          | 105-6          |  |  |
| Saiga                    | 192            |  |  |
| Sambar deer              | 149            |  |  |
| Sand badger              | 67             |  |  |
| Saro                     | 72             |  |  |
| Sassaby                  | 184            |  |  |
| Savanna fox              | 35             |  |  |
| Schomburgk's deer        | 150            |  |  |
| Sea bear                 | 99-101         |  |  |
| Sea cows                 | 110-3          |  |  |
| Sea lions                | 101-2          |  |  |
| Seals                    | 98-101, 104-10 |  |  |
| Sea mink                 | 58             |  |  |
| Sea otter                | 71-2           |  |  |
| Sebala cat               | 85             |  |  |
| Sei whale                | 18             |  |  |
| Seladang                 | 169            |  |  |
| Senegal hartebeest       | 184            |  |  |
| Serow                    | 193            |  |  |
| Serval                   | 85-6           |  |  |
| Shapo                    | 199            |  |  |
| Sheep                    | 198-9          |  |  |
| Sheep cow                | 194-5          |  |  |
| Short-tailed weasel      | 56             |  |  |
| Siberian ibex            | 196            |  |  |
| Siberian leopard         | 91             |  |  |
| Siberian tiger           | 96             |  |  |
| Side-striped jackal      | 29             |  |  |
| Silver-backed fox        | 34             |  |  |
| Silvertip                | 41             |  |  |
| Simba                    | 92-4           |  |  |
| Siamese fox              | 34             |  |  |
| Sing-sing waterbuck      |                |  |  |
|                          | 179            |  |  |
| Sika                     | 149-50         |  |  |
| Sitatunga                | 175            |  |  |
| Sitka deer               | 155            |  |  |
| Skunk dolphin            | 14             |  |  |
| Skunks                   | 67-9           |  |  |
| <b>S</b>                 |                |  |  |
| Slender-tailed meerkat   |                |  |  |
|                          | 78-9           |  |  |
| Sloth bear               | 46             |  |  |
| Small spotted serval     | 86             |  |  |
| Snow leopard             | 92             |  |  |
| Snow weasel              | 56             |  |  |
| Somali beira             | 190            |  |  |
| Somali wild ass          | 124            |  |  |
| Soor                     | 135            |  |  |
| South African cape seal  | 101            |  |  |
| South American sea lion  | 102            |  |  |
| South American tapir     |                |  |  |
|                          | 127            |  |  |
| Southern fur seal        | 101            |  |  |
| Southern sea elephant    |                |  |  |
|                          | 110            |  |  |
| Spanish wild goat        | 197            |  |  |
| Spectacled bear          | 42             |  |  |
| Speke's gazelle          | 189            |  |  |
| Sperm whale              | 4-6            |  |  |
| Spotted chevrotain       | 144            |  |  |
| Spotted deer             | 148-50         |  |  |
| Spotted dolphin          | 13             |  |  |
| Spotted hyena            | 80-1           |  |  |
| Spotted linsang          | 74             |  |  |
| Spotted skunk            | 67, 69         |  |  |
| Springbok                | 186-7          |  |  |
| Steinbok                 | 187-8, 197     |  |  |
| Steller's sea cow        | 112            |  |  |
| Steller's sea lion       | 101-2          |  |  |
| Stoat                    | 53-5           |  |  |
| Stone marten             | 61             |  |  |
| Strandjut                | 81-2           |  |  |
| Strand wolf              | 81-2           |  |  |
| Striped hyena            | 81             |  |  |
| Striped Madagascar civet | 76             |  |  |
| Suasupucu                | 157            |  |  |
| Sumatran rhinoceros      |                |  |  |
|                          | 132            |  |  |
| Sun bear                 | 43-4           |  |  |
| Suni                     | 189            |  |  |
| Suricate                 | 78-9           |  |  |

Swamp cat 84  
Swift fox 33-4  
Syrian brown bear 43

**T** Takin 194  
Tamarao 167  
Tapirs 126-7  
Taruga 156-7  
Tayra 62  
Teledu 67  
Thanin 150  
Thomson's gazelle 189  
Tibetan antelope 192  
Tibetan wild ass 124-5  
Tiger 94-6  
Tiger cat 87  
Tiger genet 74  
Tiger weasel 59-60  
Timber wolf 23-5  
Topi 184  
Townsend fur seal 101  
Tree hyrax 120-1  
Tsaine 169

**U** Urial 199  
Urus 166

**V** Vaal rhebok 181  
Vicuña 143  
Virginia deer 154-5  
Vlakovark 136  
Vontsira 76

**W** Walrus 102-4  
Wapiti 152-3  
Warrigal 27-8  
Wart hog 136  
Waterbucks 179-80  
Water buffalo 166-7  
Water civet 76  
Weasels 53-7

**W** Weddell's seal 110  
Western kob 180  
Western tur 197  
West Indian manatee 113

Whales 2-21  
White-beaked dolphin 13-14

White dolphin 13  
White-faced musk ox 195

White-flag dolphin 15  
White-lipped peccary 137

White oryx 183  
White rhinoceros 130-1  
White-sided dolphin 13-14

White-tailed deer 154-5

White-tailed gnu 184  
White-tailed mongoose 78

Wild cat 83  
Wildebeests 184-5  
Wild goat 197

Wisent 171-2  
Wood bison 171  
Woodland caribou 160

Wolverine 63-4  
Wolves 23-6

**Y** Yaguarundi 86-7  
Yak 168-9  
Yellow jackal 29

**Z** Zebra duiker 179  
Zebra mungo 78  
Zebras 125-6  
Zebu 167-8  
Zorilla 63

