WILD ANIMALS IN BRITAIN

1 ROE DEER

The roe deer is a shy little animal, and likes the shelter of the woodlands. When it emerges from beneath the trees and bushes it is ever on the alert for danger, as is shown in this picture of a buck and a doe

[*From a painting by the late J. G. Millais*

The British Nature Library

WILD ANIMALS IN BRITAIN

By

FRANCES PITT

SECOND EDITION, REVISED

LONDON
B. T. BATSFORD LTD.
15 NORTH AUDLEY STREET, W.1
AND MALVERN WELLS, WORCESTERSHIRE

Books by Frances Pitt

Animal Mind
Woodland Creatures
Shetland Pirates
Waterside Creatures
Tom, My Peacock
Diana, My Badger
Toby, My Foxcub
Katie, My Roving Cat
Tiny, My Terrier
Moses, My Otter
Scotty: The Story of a Highland Fox
The Naturalist on the Prowl
The Intelligence of Animals
Birds and the Sea
Wild Nature's Day
Wild Life Studies
Jane Squirrel
Betty, *Etc., Etc.*

Edited by Frances Pitt

Romance of Nature
An Anthology of Modern Animal Writing

First published, October 1938
Second Edition, 1944

MADE AND PRINTED IN GREAT BRITAIN
FOR THE PUBLISHERS, B. T. BATSFORD LTD., LONDON
BY JARROLD AND SONS LTD., NORWICH

Preface

Books on birds are innumerable, and the bird-lover has a multitude from which to choose, but books on mammals are comparatively few, and those on the wild animals of the British Isles a slender company. Hence this account of the mammals of Britain, which it is hoped may be of use to those who wish to know more of this portion of our fauna.

My aim throughout has been to present in a readable and concise form a description of each species, its character and life, based so far as is possible on personal observation.

No account of present-day animal life in Britain can wholly ignore the species lost within recent times, so brief reference is made to those, such as the wolf and wild boar, exterminated within the Historic Period. But the more ancient beasts, such as the mammoth and the "Irish elk", really a large red deer, are ignored, for they have been gone too long.

The reader's attention must be drawn to the illustrations, of which the major proportion are from photographs, including an example of colour photography, in contrast with which we have reproductions of old woodcuts. When Thomas Bewick published his *History of Quadrupeds* in 1790, his illustrations were considered marvellous pictures of the animals portrayed. We may not think them such exact portraits now, but no one will deny their beauty of line and quaint charm, and they afford the reader the opportunity of comparing eighteenth-century woodcuts as applied to Natural History with the work of the camera to-day.

The painting of Roe Deer, by the late J. G. Millais, which forms the frontispiece, is reproduced from his great work, *The Mammals of Great Britain and Ireland* (Longmans Green, 1906), by very kind permission of Mrs. Millais. That of Noctule Bats is reproduced by courtesy of Messrs. Oliver and Boyd, and by the kindness of its present owner, Mr. Michael Blackmore. It was drawn by the late E. A. Wilson, of Antarctic fame, and formed a plate in Major G. E. H. Barrett-Hamilton's *History of British Mammals*.

In preparing a new edition of this book for the press, I would like to take the opportunity to thank the many readers of the first issue for their appreciative and helpful remarks and the information they have sent me concerning the mammals of Britain.

Bridgnorth
January, 1944

Frances Pitt

Acknowledgment

THE PUBLISHERS must acknowledge their obligation to the following photographers whose work appears in these pages, namely: Mr. W. S. Berridge, F.Z.S., for figs. 14, 54, 55, 78, 92, 98, 103, 104; Mr. Michael Blackmore, for figs. 44, 46, 49, 51, 52, 53; Mr. Arthur Brook, for fig. 32 (supplied by Literary Services); Central Press, for figs. 5, 100; Mr. S. Crook, for figs. 34, 70, 71, 102; Mr. F. Martin Duncan, F.Z.S., for fig. 76; Fox Photos, for figs. 7, 12, 38, 85, 87, 88, 91, 99, 101; Mr. J. Gibson, A.R.P.S., for figs. 95, 96; Mr. Eric J. Hosking, F.R.P.S., for figs. 30, 39, 47; Mr. John Kearton, for fig. 10; Miss Phyllis Kelway, for figs. 37, 42, 56, 57, 58, 59, 60, 61; Captain C. R. W. Knight, for fig. 68 (supplied by Literary Services); Literary Services, for fig. 6; Mr. John Markham, for figs. 64, 65, 67, 69, 72, 77, 81; Mr. Ray Palmer, F.Z.S., for fig 50; Mr. Oliver G. Pike, for figs. 8, 13 (supplied by Literary Services); Mr. A. R. Thompson, for figs. 23, 24, 40, 66, 74, 75, 80, 93; Topical, for figs. 84, 86; and Dr. Graf Zedtwitz, for figs. 63, 90 (supplied by Literary Services). All the remaining photographs are by the Author. The drawing on p. 116 is reproduced by courtesy of Mrs. Marjorie Quennell, from *Everyday Life in the Old Stone Age*, by Marjorie and C. H. B. Quennell, and fig. 83 is included by permission of the Victoria and Albert Museum.

Contents

THE FALLOW-DEER

2 THE DORMOUSE

This portrait shows a dormouse among its favourite hazel twigs, looking down with large dark eyes at the world below. Its little hand-like paws enable it to run up and down the most slender twigs with the utmost ease and security, for it can maintain a wonderful grip with its hind- as well as its fore-feet

3 "BROCK"

"Brock" was the old name of the badger, and it survives yet in the titles of many places, such as "Brockton," "Brocklesby," and other towns and villages

CHAPTER I

The Mammals of Britain

THE animals of the British Isles, though not numerous, are of exceptional interest. We have several species, and more sub-species, peculiar to us. The effect of isolation is apparent in this case. We also see how the distribution of land mammals is affected by arms of the sea, and by channels comparatively narrow but of considerable depth.

By the way, I have here used the word "animal" in its popular sense, namely, as a synonym for "mammal," that is a beast which suckles its young. Most persons are aware that rats, rabbits, hedgehogs, cats, badgers and foxes are mammals, but not so many that bats, seals, porpoises, dolphins and whales come into the same category. The whale is as much a mammal as the mouse, the cat, or the cow suckling her calf in the meadow. All these creatures suckle their young, and so does the bat, which indeed nurses its baby with the utmost devotion.

In this book will be given an account of the animals of our countryside, of our hills and moors, of our coasts and our seas. I propose to deal fully with the beasts about us, such as the fox, the badger and the shrew, also the seals that breed on our shores, but to give a less detailed account of those animals of the sea, the whales, porpoises and dolphins which only cruise around the coasts, for my aim is to provide the naturalist with a reliable guide to the identification of the beasts he may come across during his country rambles, and with information about their ways.

For instance, the shrew we sometimes find lying dead on the garden path, often spoken of as a "shrew mouse," presents a mystery. It may or may not have been killed by the cat. She does slay a number and rarely, if ever, eats one, but many die during the late summer and autumn months in an unexplained manner. At least the explanation has become apparent only in comparatively recent years. It is simply that shrews live intensely, age early and die quickly of old age. They appear

to be endowed with little more longevity than annual plants, which flourish for their short season, flower, bear seed, wither and fade.

The common shrew, of course, is not a mouse, but a member of the interesting order *Insectivora*, of which the mole and hedgehog are other representatives in Great Britain, though not Ireland.

Apropos of this and the peculiarities of our British fauna, it is interesting to find that whereas the British Isles possess some seventy-five species and sub-species of native breeding mammals—in addition to which there are three recently introduced species, namely, the grey squirrel, musk rat and edible dormouse—the proportion found in Ireland is comparatively small.

The hedgehog, the mole, the brown hare, the wild cat and polecat, the common and water shrews, are not, for instance, natives of Ireland. Yet Ireland has certain species of her own. Her stoat is peculiar, *Mustela hibernica* not being found anywhere else, save in the Isle of Man. Her hare, too, is her own, for *Lepus hibernicus*, although akin to the Scottish mountain or blue hare, is considered more distinct from it than the Scottish is from the continental form. Hence, while the hare of Scotland bears a trinomial, that of Ireland enjoys full specific rank and is just *L. hibernicus*. Such facts are considered as indicating the early separation of Ireland from the European land mass to which Great Britain remained attached for a considerably longer period, and from which she secured species that found themselves cut off from further advances westwards.

Reference to these early times brings us to the question of species exterminated within the historic period—indeed we may say within the recent historic period. When the Normans invaded England, wolves were numerous in the woods, the wild boar was a feature of the land and the beaver still made its dams across the rivers. Wild cattle also roamed the heaths, while the wild cat, polecat, and pine marten were common around London.

The so-called wild cattle, of which descendants survive in one or two parts, the most notable herd being that of the Earl of Tankerville at Chillingham Park in Northumberland, were not really wild, but were gone-wild beasts. They were undoubtedly animals that had, during the wars and raids which troubled the country, escaped and taken to the woods and

hills. When the Norman monarchs granted to certain faithful subjects the right to empark areas of land, the wily noblemen did not neglect to drive within the park fence all the deer, cattle and so on that they could.

The cattle at Chillingham, a herd some fifty to sixty strong, have roamed there in the great park since the Middle Ages, without, so we are told, any admixture of other blood. Howsoever that may be, they have maintained their type unchanged, and are smallish, creamy-white beasts, with upright horns and of conformation much below the standard of modern improved stock. Their ears and noses are brown, and they show flecks of colour on feet and legs; in fact they are white with dark points.

Perhaps the most striking thing about these cattle is their wildness. Although they are fed on hay during the winter, they are shy and timid to a remarkable degree. To get a snapshot of them necessitates stalking them with as much care as if they were deer, and the keeper avers that they will attack a stranger. When it is desired to destroy one it has to be shot, for it is impossible to drive them into a building.

So much for the Chillingham cattle, described in detail to remind the reader of what has vanished from our land within a few hundred years. When such cattle were wandering about this country the owner of sheep had to be careful of his flocks. *Canis lupus* was then nearly as common as the fox is to-day, and noblemen went out wolf-hunting as an ordinary amusement.

How long the wolf survived in Britain is by no means certain. So many legends surround the killing of "the last one" that it is difficult to distinguish fact from myth, but it was the coming of the gun that exterminated it in England, Wales, Scotland and Ireland, so that by the end of the eighteenth century not a single specimen survived anywhere.

The gun was fatal to other creatures, particularly those not of especially nocturnal habits. The trap and the gun cleared the wild cat and the pine marten from all but the most remote districts, also the beaver from the streams. *Castor fiber* had valuable fur and was a nuisance on the waterways; moreover it was easy to locate. We now grieve that it is gone, for we have nothing in exchange.

The wild boar too, indeed more so, was a nuisance in the countryside, raiding crops and doing a great deal of damage. Gentlemen tolerated *Sus scrofa* for the sake of the sport with

which it provided them, but the farmers did not enjoy visits from wild pigs followed by little striped young ones, which rooted up their crops and made havoc here and there. It is no wonder that, despite boar-hunting being a kingly sport, wild pigs grew less and less. However, they seem to have been fairly plentiful up to the sixteenth century. After that they could not be tolerated any longer.

From this it will be seen that the mammals of the British Isles, as we know them to-day, are by no means fully representative of those indigenous to the land, yet it is amazing that in so thickly populated and highly cultivated a country we have contrived to keep the species we still retain. That such an animal as the badger should be with us is truly amazing. Here we have a largish solid beast, not particularly agile or swift, never a popular favourite, never protected for the sake of sport, more often sorely persecuted; yet it not only still occurs but has much increased in recent years so that it is now quite common and even found in well-frequented districts. It probably owes its successful survival to its strictly nocturnal habits and the care with which it keeps out of sight.

The fox is in a different category. A predatory and mischievous animal, its presence in most parts of the country, particularly in the English Midland Counties, is frankly a matter of protection. As the basis of fox-hunting, one of the most important of English country sports, it is forgiven deeds that would long since have brought about the extinction of another animal. While the wild cat is relegated to the remote fastnesses of the Highlands, the fox remains, lives and enjoys itself in our midst, and the man who raises a gun against it is eyed askance.

But *Vulpes vulpes* will be dealt with at length in an early chapter, so let us leave it now and consider the mammals we have gained in place of those we have lost.

The grey squirrel is an alien species from North America that has lately established itself in Britain and has acquired a bad reputation in so doing. *Sciurus carolinensis* is no exchange for the rare pine marten. Then there is the edible dormouse, *Glis glis*, from the Continent, which has obtained a foothold in Buckinghamshire and appears likely to become a great nuisance. And, lastly, the musk rat, *Ondatra zibethica*, must remain a dreadful warning as to the consequences of letting loose strange animals in the land. About it and others, more

4 WILD WHITE CATTLE

This snapshot shows the Chillingham herd of wild white or park cattle, sheltering shyly beneath the great trees of the park at Chillingham in Northumberland, where they have been maintained since the Middle Ages. The animals are very timid, and panic at the sight of a stranger

5 WOLVES

There was a period, and a comparatively recent one too, when such scenes as this were to be seen in our winter woodlands, for the wolf lingered on in Britain until quite late historic times. But this fine beast was too serious a menace to the flocks, and when firearms came into general use the last one was soon killed

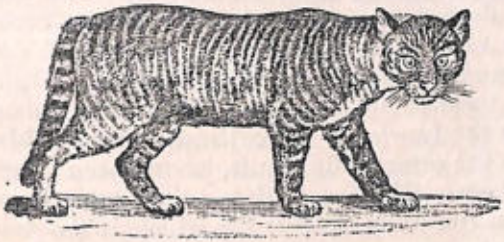
6 WILD PIGS

In days of old the wild boar was a native of our forests, and the sows brought their striped young ones forth from the woods to raid the farmers' crops. Such scenes as the one shown above were common in our wilder areas throughout the Middle Ages

7 THE BEAVER

This photograph of three beavers, the one at work gnawing a stick, the second watching it and exhibiting its peculiar broad flat tail, while a third swims in the distance, is a reminder of the times when beavers were found on English rivers and made their dams across our streams

must be said later on. Now it suffices to say that the mammals of Britain, if not an extensive collection, nevertheless comprise a number of interesting species, and present many peculiar problems, and that there is much to tell concerning not only those mentioned above, but about our deer, hares, mice, rats, stoats, weasels, and so on.



THE WILD-CAT

CHAPTER II

The Fox and the Wild Cat

THE fox is perhaps the best known of British mammals, while the wild cat is among the least known. The two afford a contrast. Both are members of the *Carnivora*, both are interesting but very predatory animals, capable of doing much damage among poultry and to game birds; yet the fox is numerous throughout England, Wales and Ireland, and is frequent in the Lowlands of Scotland, but the wild cat is now confined to the central Highlands, having been long exterminated elsewhere. The fox, *Vulpes vulpes*, owes its prosperous existence to fox-hunting, but for which it too would be an outlaw of the remote wilds. The wild cat, *Felis silvestris grampia*, once found throughout the wooded districts of England and Wales, even to the outskirts of London, was never of interest to sportsmen and has always had to face stern persecution. But before considering it we will deal with the British fox.

Most people are more or less familiar with the appearance of a fox, its somewhat slight dog-like shape, pricked ears, keen muzzle and thick full brush. Our fox is similar to that found on the Continent which ranges eastwards into Asia. The red fox varies considerably both in size and coloration: some individuals are golden-red, others brownish; some have more black on feet and legs, and so on. Sub-species have been distinguished, the fox of Britain being assigned to *V. v. crucigera*, the race found throughout Central and Southern Europe; but even within our islands no two foxes are exactly alike.

It was formerly thought that we had several races. Country people talked of the "greyhound fox" and the "little dark fox" Undoubtedly the hill foxes tend to be bigger than the foxes of the low country, those of the Lakeland Fells and of the Highlands of Scotland being particularly fine animals, some of them as much as 20 lbs. or more in weight. The average weight of a dog-fox in the English Midlands is not more than

15 lbs. or 16 lbs., a vixen being 12 lbs. to 14 lbs. But as I have said, foxes vary greatly both in size and other characteristics. Popular belief has it that the white tag at the end of the brush is a sign of an old dog-fox, but it quite as often adorns a vixen.

A tame vixen of mine had a particularly good brush finished off with an inch and a half of white, and this she had from the time she was a tiny cub. Moreover, one of the finest old dog-foxes it has been my lot to see had hardly any white at the end of his tail.

This fox was killed by the hounds one November day after a very good hunt, during which much country was covered. His mask was grey and scarred, his teeth were worn and broken, and he looked an ancient warrior. Among the few persons who got to the end of the run was a farmer who, after one glance at the fox, recognised it by a mark in its ear. He had marked it, then a cub, fourteen years before.

Seemingly the fox's natural span of life is about the same as that of a dog. I knew a pet one that led a pampered existence for fourteen years, and then died of what was apparently senile decay.

The fox is not a domesticable animal. It has nothing of the dog's loving obedience to a master, nor any tendency to follow a leader. It is naturally solitary, each one hunting for itself and by itself, save when the needs of the cubs compel thought for them. Its self-sufficiency is shown by its silence. The dog gives tongue in order to call his fellows to aid him in the chase, but the fox stalks his prey with cat-like stealth and seldom utters so much as a whimper. Yet the fox is by no means mute. The dog-fox can bark, particularly when the desire for a mate sends him questing through the damp winter night. I particularly remember a January evening when I went forth to listen for foxes, and heard fox voices coming through the darkness from several directions. "Wouf! wouf! wouf!"—three gruff barks and a pause, to be followed by three more, were heard first on one side and then another. There were at least three dog-foxes moving through the woods and calling at intervals; and then came a weird screech, a strange, unearthly and rather horrible sound, and I knew that a vixen was afoot and was no doubt the cause of all the excitement.

The cry of the vixen is a really dreadful noise, yet it is one of joy and excitement. My pet vixen, Lizzie, often raised her

voice in greeting when a dog friend came to see her, and she sometimes yelled at me.

With regard to this vixen's liking for the companionship of dogs, there is a widespread belief that the dog and fox will hybridise, but the belief lacks authoritative support and appears to be based merely on the occurrence of foxy-looking dogs. I had a tame dog-fox which was the best of friends with a terrier bitch who lived with him, but despite his attachment to her no attempt at mating was made.

The red fox is a faithful mate, wedded couples being seemingly true to one another until divorced by death or circumstances. The old idea that the dog-fox consorts with any number of vixens is certainly wrong, Nature demanding his undivided attention to his offspring. He has got to help his vixen bring up the cubs; she cannot hunt for them single-handed.

Mating usually takes place in January and the litter generally comes into the world in March, but February litters are not uncommon, and the cubs may be as late as April or even May.

Five or six cubs comprise the average litter, though larger families occur. A case was reported to me of twelve cubs of precisely the same size and age being found in a drain. It is most unusual for two vixens to share a nursery, but I think they must have done so in this case.

The cubs at birth are queer, mouse-coloured, rat-like, blind, helpless little things, with no likeness whatsoever to the lovely animals that they will later become. However, they grow and develop with remarkable rapidity. Their mother lies with them for the first few days, but after this merely visits them at intervals, either lying in an adjoining hole or in the bushes nearby.

Although it is the rule for a burrow or earth to be used as a nursery, a vixen will sometimes find accommodation above ground. I have known of cubs bred in faggot-piles and in thick undergrowth; indeed in some areas "stub-bred" foxes are quite common.

So soon as the cubs begin to eat—their eyes open about the fourteenth day and their teeth appear in three weeks—the dog-fox has to bestir himself. Hitherto, although he has brought food for the vixen, he has not been overworked, but with some half-dozen cubs getting more and more active the calls upon him increase.

8 YOUNG FOXES

Fox-cubs are sociable, playful creatures, and enjoy romping together. These two, though nearly full-grown, are still attached to one another. They are typical British foxes in colour and markings. Note the white tag on the brush of the leader, which decoration is common in the species

9 This snapshot of a young vixen shows that the white tag to the brush is a distinction of neither age nor sex, for she has a particularly fine one

10 This cub lies half asleep beneath the sheltering bank, but we may suspect that even a wind-blown leaf would cause it to jump up and play

Now is the time when poultry-keepers complain, for any hens not properly secured are sure to be carried off. One might imagine from all that is said that the fox lives entirely on the best pullets, but in reality the rabbit provides the bulk of its food, though hares and leverets also figure on the menu, as do birds of every description, field mice, frogs and even beetles. Examination of the droppings will often show that the fox had a mixed feast, the dark wing-cases of beetles testifying to the number of these insects which were consumed.

As April advances the cubs become stronger, and more active, less content to lie quietly in the inner parts of the earth, and more anxious to see something of the outside world. The fox is not really a nocturnal mammal; it is only circumstances which compel it to go about its affairs under cover of darkness, and young foxes often come forth from their holes to enjoy the sunshine. A spring afternoon is a likely time to see them abroad, and what a lovely sight they afford!

I remember a day when the wild daffodils were yellow in the meadows and the larches were a delicate green against the blue of an April sky, making my way to a look-out spot whence I could view an earth believed to be the home of a strong litter of cubs. This earth, originally excavated by badgers, was on a bank beneath the roots of an old wych-elm. The tree was not yet in leaf, its twigs being tasselled with red flowers, yet what caught my eye was not elm blossom, but movement on the ground beneath the branches. The fox-cubs were out and running about.

A sandy-red shape moved here and there. One youngster stepped forth from a hole and stood in the sunshine looking out over the valley which lay in a patchwork of green and brown fields stretching away to distant purple hills. Its sharp muzzle, pricked ears and dainty form were illuminated as by a spotlight, but I had not many minutes in which to study its youthful shape, for another cub came forth, and made a rush at number one. Head over heels they went, tumbling and rolling in a mad romp, but the three other cubs that were in view made no attempt to join the game. One stalked a wind-blown dry leaf, another investigated the meatless wing of a pheasant, and the third stretched itself full length on the ground.

How happy and unsuspicious the family seemed; nevertheless they were on the alert. I moved slightly and stepped

inadvertently on a twig which broke with a snap—the cubs were gone!

As the spring days pass the young foxes get more and more adventurous, and early summer finds them leaving the home earth to lodge here and there, and even lie out in the bushes, bracken, and standing crops, such as corn and beans.

Apropos of leaving their home; there may have been an earlier removal, for the vixen, like the cat, thinks nothing of carrying her babies from one place to another. If anything upsets her, such as human scent about the earth, she will at once shift the litter. She picks the cubs up in her mouth, taking them one at a time by the skin at the back of the neck, and bears them off. Between their birth and the time they reach independence they will have had many lodgings.

The youngsters remain in touch with one another until the autumn, when the necessity of finding food compels them to spread out. Where foxes are strictly preserved, as in the Midlands of England, they may be fairly "thick on the ground," but where they are less numerous one usually finds each pair occupying a certain area—in fact, the territorial system is in vogue among foxes as in the case of many mammals and birds.

When very numerous, foxes, like other animals, tend to epidemic diseases, such as mange, which is a dreadful scourge. The earths become infected and it spreads rapidly. In my experience badgers do more to prevent mange among the foxes than anything else. The badger is a most cleanly creature—which is more than we can say for the fox—and is forever digging and scratching and cleaning out the earth with great benefit to the health of the fox.

Jaundice sometimes occurs among foxes, the symptoms being the same as those of "yellows" in the dog, and it may be due to chill or infection contracted from rats, for foxes will catch and kill rats when these rodents are lodging in the hedgerows, and it is known they are carriers of an infectious type of jaundice.

I have mentioned the considerable variation, in size, colour and markings, that normally occurs among foxes, in addition to which freaks sometimes turn up. White foxes are occasionally reported. The nearest approach to an albinistic specimen that I have seen was out cub-hunting one September morning

11 THE FOX

The British red fox varies somewhat in colour and markings, but this is a typical one, from its cream-edged ears with their black tips to its thick brush with a white tag at the end

[*From a Dufaycolor photograph by Frances Pitt*

in Shropshire, when a cream-coloured cub popped out of some bracken and allowed me a good view. It was a very small fox of a pale cream-buff shade with dark rings about its eyes. It was indeed a queer looking creature. It escaped the hounds, but was never seen or heard of again. Bob-tailed foxes occur more frequently (I have known three), but the absence of brush is probably due to accident, not inheritance. However, freak foxes are not nearly so interesting, nor so beautiful, as a typical specimen, especially an old dog-fox in his full winter pelage, in the glory of his russet coat, his ruffled neck, his thick full brush, his black and white marked muzzle, his dark-tipped ears, with the whole as a setting for his keen, cunning, amber eyes.

From the well-known fox, frequenter of every wood, we must now turn to that rarity, the wild cat.

The wild cat that is found in Great Britain is considered by scientists to be a sub-species of the European wild cat, hence its trinomial of *Felis silvestris grampia*, but the distinguishing features of the geographic race peculiar to Scotland are merely slight differences of size and shade of colour.

Wherever met with the true wild cat is a large striped tabby cat with a broad head, ferocious expression and a handsomely ringed tail. It must not be confused with the gone-wild cat of domestic ancestry. The two are very different; indeed the psychological contrast is amazing, for, whereas the domestic cat is naturally of a most friendly disposition, the wild cat is literally untamable.

In many old Natural History books the wild cat is spoken of as the "British Tiger," an excellent title for an animal of amazing ferocity and indomitable courage, which has never cringed for a saucer of milk. This cat has always been reputed untamable, and I have failed to trace any record of a specimen being domesticated. I have brought up small kittens, and lavished on them attention which would have transformed a fox or an otter into a house pet, yet have failed to get beyond terms of armed neutrality. My Satan—so named when, as a wee kitten, tired and woebegone by a long journey, he emerged, spitting indomitably, from his travelling box—was soon untouchable and retained his title of "Satan" to the end of his days. Nevertheless, I believe he was tamer than any previous captive wild cat.

I doubt there being any blood of the European wild cat in

the veins of our fireside puss. It is known that she is of Eastern descent, possibly originating from the Egyptian Caffre cat, with which she has much in common, and that she was brought here in the early Middle Ages, but my doubts rest on experience of the nature of hybrids between *F. silvestris* and *F. catus*. These two cats will mate, and their offspring are fertile, but the hybrids show almost complete dominance of the wild cat type. They are rusty-hued striped tabbies, with thick tails ringed with black, which tails terminate more abruptly than in the domestic cat; and they inherit the sporting disposition of the wild cat, besides being nervous and queer-tempered. My crossbreds could not be trusted free after they were half-grown because they attacked poultry and ducks. Had I not shut them up they would have been off to the woods.

Before going further, let me pause and say that there are no definite anatomical differences between *F. silvestris* and *F. catus*. The skull and bones, and also the teeth, of the wild cat are heavier and stronger, but this is all. The old idea that the intestines of the wild cat are twice the length of the tame cat, and that the latter has more caudal vertebræ, is just nonsense. They are precisely the same. In coat pattern we do find some distinction. As in the case of so many domestic animals, *Felis catus* exhibits many colour varieties, but the preponderance of tabby colouration suggests that such is its ancestral type, though the tabby markings often follow a blotched scheme never seen in the true European wild cat. *F. silvestris* is ever a *striped tabby*.

But seek such distinction as we may, we come back to the fact that it is in habits and character that these cats differ most. The wild cat has, for instance, an undoubted tendency to monogamy, a trait at marked variance with the promiscuous behaviour of our household puss.

On the wild mountain-sides of Scotland, where life is strenuous, a free and easy life such as that typical of the common tom-cat is not compatible with the rearing of offspring. Records show that wild cats are usually found in couples, that where a female is met with a male is sure to be at hand, and that when a litter of kittens is discovered the mother and father will not be far away. I am without evidence as to whether the sire, like the dog-fox, helps to kill for the family, but suspect such to be the case. He is

certainly a faithful mate, and the couples possibly, indeed probably, pair for life.

My wild cat, Satan, was reared in company with a domestic kitten of the Persian type and became devotedly attached to her. However savage he might be in other respects, he was always most gentle with her and rent the air with hideous cries of lamentation whenever she left his quarters. He would not accept any substitute. I several times introduced other females, but he attacked them at sight and they had to be allowed to escape for fear of their suffering seriously from his fury. He never cast an attentive eye on any female save his mate. The same cannot be said for Beauty. She did let her fancy wander when opportunity served, and had several litters of kittens which were clear evidence of infidelity.

Although the domestic cat has at least two litters per annum and sometimes produces three lots of kittens, the wild cat on its home hills seems, like the fox and the badger, to be content with one effort. This litter is usually born in the spring, April being a frequent month, and some hole between the rocks or other comfortable shelter serves as a den. The kittens may number from three to four, or five, or even six. No doubt the mother purrs over them as fondly as does our fireside puss over her kittens, but I can only say that the wild cats of which I have had experience have not demonstrated their ability to purr at all. I can vouch, however for their ability to spit, hiss and growl like furies.

The food of *Felis silvestris* embraces everything it can surprise and kill. Grouse, blue hares, rabbits and so on are commonly found at the dens. It is unquestionably a most predatory mammal, and it is no wonder that it is unpopular with gamekeepers and ghillies. So severely was it persecuted prior to the War of 1914–1918 that its numbers became more and more reduced. It dwindled and dwindled; its disappearance seemed at hand. Naturalists foretold its early extermination in even its last stronghold in central Inverness-shire. Then came the Great War, which, however awful its results in other respects, brought an amnesty to such persecuted creatures as the wild cat, the pine marten and the polecat. With all the younger gamekeepers and ghillies away seeking more important game than the vermin of the hills, and the elder ones concentrating their energies upon tasks of national importance, the wild animals had a fine time. Such

outlaws as the wild cat were able to raid the grouse without check or hindrance, and they rallied in a remarkable manner. Wild cats appeared in places where they had been unknown for many years. They spread both northwards and southwards. That increase has been more or less maintained. Certain Scottish landowners, placing the preservation of an interesting native mammal higher than a few brace of grouse, have afforded the wild cat protection, and at the present time the species is still spreading throughout Inverness, south into Perth, and north into Ross, Sutherland and Caithness.

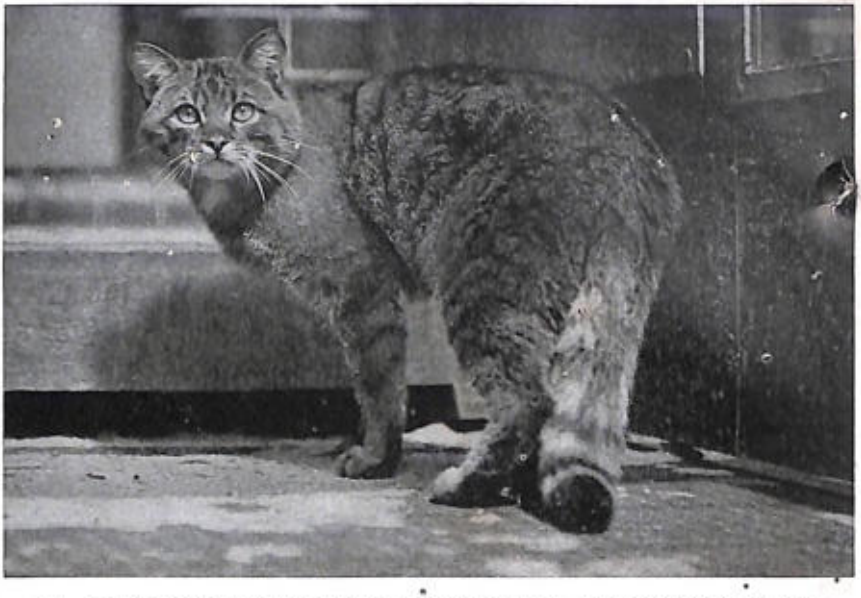
Although formerly abundant throughout the wooded districts of England and Wales, *F. silvestris* was never a native of Ireland, and references to Irish "wild cats" mean either gone-wild house cats or specimens of the pine marten. Likewise, any present-day wild cat south of the Scottish Border may be safely assigned, even without inspection, to the fireside cat that has got into bad habits.

Reverting to the habits of the wild cat in its mountain home, apart from its domestic concerns it is essentially a solitary mammal, roaming the woods and hills in lonely independence, seeking no company in its raids, nor when it retires to rest. This rest it may take in any warm dry nook, and I have heard of an old male who daily retired to a disused crow's nest in a fir tree.

Of course, this cat can climb as well as its domestic counterpart and thinks nothing of scrambling up a tree. It is this amazing activity which makes a furious cat so terrible an antagonist. Great stories are told by shepherds, and others whose duties take them out on the hills, of encounters with wild cats, when their dogs, coming by mischance on a mother with kittens, have had to withstand an onslaught which to them seemed that of the Devil in person. Animated by mother love and selfless fury on behalf of her young, a wild cat is then a veritable fiend and a truly fearful foe. Her pluck is amazing: but no cat, male or female, will attack save in defence of the young or when driven into a corner. Wild cats are not aggressive creatures. After all they are comparatively feeble animals. Much of their preparation for combat consists of bluff. The hair on end and fluffed-out tail make them look twice their proper size, and the glaring eyes, the spitting and hissing, all render them intimidating objects. It is better, they find,

12 Disturbed, perhaps, by the sound of the hounds, this fox departs in a hurry

13 The young cub shows a contrast in deportment, and merely turns to see what aroused its attention



14 An old male, with the black-tipped tail and dark-soled feet typical of his species

15 A young female of the true Highland stock, and of the usual fierce temperament

to bluff and live for another day, rather than fight and be overwhelmed.

With regard to hybrids between wild and domestic cats, I have bred a number, all of which, though not so fierce as their sire, inherited a considerable measure of his untamed spirit and had, as already remarked, to be kept shut up because of their predatory instincts. A young male, known as the Imp of Satan, killed a duck before he was four months old. After this I shut him into a pheasant aviary—unoccupied by pheasants—and only took him out for daily walks. He caught rabbits like a dog and we rarely returned without one, but there came an evening when he eluded me in the twilight and I had to leave him out all night. I found him next morning, but he had poultry feathers on his whiskers and three hens lay headless in a nearby fowlhouse! After this I abstained from taking the cat for walks.

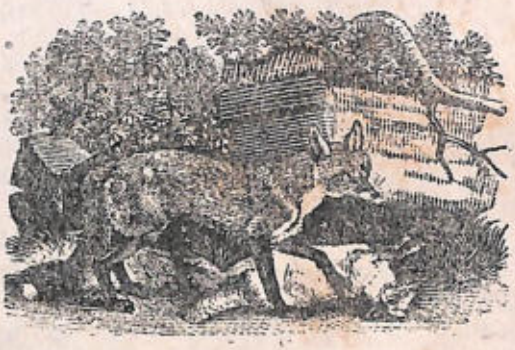
The offspring of the first cross—that is, to use the term employed in researches in heredity, the F_2 generation—show throwbacks as regards coat-pattern and length of fur to both the wild and domestic grandparents. Unfortunately, cats are difficult subjects for experiments in the inheritance of such characters, for one cannot keep and breed them in unlimited numbers as one can moths or flies.

Reverting to *Felis silvestris* in its native wilds, it has in every sense of the word a hard life. It wrests a meagre existence at the expense of the hares, rabbits and birds of these remote places, probably supplementing them with smaller game, such as the mice and voles that live in the heather and rough grass; and whatever it does, and wherever it goes, every man's hand, armed with gun and trap, is against it.

It is sometimes stated that the wild cat is afraid of a mouse. This I believe to be a pure myth. I do not think any wild cat is ever afraid of anything upon which it can pounce. My Satan had an extraordinarily swift paw where mice were concerned. He killed them at once and wasted no time in playing with them. So prompt and efficient was he that all mice caught in the house were carried to the cat's cage where he dealt with them with lightning swiftness.

Although it is a foe to game-birds and game preservation, no one who loves wild creatures can fail to admire this savage untameable outlaw, which has held out in the face of incessant persecution and maintained itself as a member of the British

fauna despite everything mankind can do against it. In the wild cat Britain has an animal as independent and truly wild as any of the mammals of the most remote parts of the world.



THE GREYHOUND FOX

16 A young female, in an attitude typical of her savage breed

17 Half-bred kittens by a wild sire. Note their tabby coat-pattern

18 A BABY ADVENTURER

Young otters have no instinctive liking for the water, and have to learn its joys by degrees. This cub was very timid, and at first would only paddle near the shore. However, she got braver, and is here shown adventuring into deep water. She enjoyed the swim so much that she next tried diving, and then turning head over heels in the water

CHAPTER III

The Otter and the Badger

THE otter is widely distributed throughout the British Isles, haunting stream and river, northern loch and southern lake. It fishes in salt water as well as fresh, yet it is one of the least known of our more frequent mammals, and many persons are hardly aware what it is like.

Lutra lutra has the long lithe body on short legs characteristic of the *Mustelidæ*, of which family it is a member; indeed, in shape and make it resembles a ferret, and it may be described as a large water-loving weasel. It has all the quick wits and inquisitiveness of the tribe, combined with an elusiveness which enables it to escape observation. Hence the manner in which it is overlooked, though it may fish in rivers running near or even through well-populated towns.

As an instance of the otter's ability to keep out of sight I well remember Madame Moses, my hand-reared pet, doing the disappearing trick one day. She was playing with me, retrieving a stick from the water, bringing it back and laying it at my feet, and then waiting expectantly for me to fling it into the pool, so that she might plunge in and fetch it again, when a strange voice was heard. Two visitors were approaching. The otter listened for a brief second, then slipped gently into the water, dived with hardly a ripple, and came up under some bushes, where, with merely her eyes, ears and nose above water, she waited, watched and listened. It was not until the strangers had departed that she came ashore and continued her game.

But, before going on to consider the habits, character and general ways of the otter, something must be said of its affinities with other British mammals. It is, as I have said, a member of the *Mustelidæ*, to which family belong the stoat, weasel, polecat, pine marten and the badger, hence the coupling of the otter and the badger in this chapter, although the latter is a comparatively slow-moving land mammal and the former is specialised for getting an aquatic living.

The otter has webbed feet and is a powerful swimmer. Its long thick tail, or "pole," is a good rudder, and helps it to turn and twist when pursuing fish. Its ears are small and well protected by the waterproof coat, the coarse outer hairs of which keep all damp from penetrating to the soft velvet-like under-jacket. This dense coat keeps the owner perfectly warm under the coldest conditions, as when it dives beneath the winter's ice, and chases the fish despite pond and lake being frozen over.

Although the otter emulates the "streamline" conformation of the fish, it is far from cold-blooded, being a creature with a high temperature. Many a time I have thrust my hand into a curled-up sleeping bundle of fur, which represented my Moses, and have been amazed at her warmth. It was a delightful feeling, particularly when one's hand was taken in a firm grip and an even hotter tongue licked one's fingers.

Despite the otter being an aquatic mammal it is, perhaps, less of a water-lover than is commonly supposed. It will often wander far from any water-course, and thinks nothing of cross-country excursions. Once, after a snow-storm, I followed the trail of what, from the footprints, I judged to be a large dog-otter. The tracks led from the banks of a stream for a quarter of a mile through a wood, across a field, into the wood again, and to and fro through the bushes, under which were many rabbit holes that had evidently been of much interest. From here the otter again went forth into the meadow, explored a hedgeside ditch, next a small pond, and then made his way back to the brook whence he had come. When he reached it he did not take to the water but ran along the bank, which he followed for a considerable distance. At last he did enter the stream where he captured a moorhen under a bush, ate it on a boulder, and then went on to the big river.

The size of the five-toed padmarks left by this otter, showed it to be a large one. Male otters may grow to a considerable size and weight. An otter that had tried to cross a main line and had been decapitated by a passing train weighed 30 lbs. *without his head.* Bigger weights have been recorded, but these individuals cannot be described as typical. Twelve to eighteen pounds for female otters and eighteen to twenty-five pounds for adult males cover the average weights.

They attain their maximum size and weight at about two

19 Emerging from the depths, and looking cautiously around

20 Eating a fish. Note how the roach is held in the hand-like fore-paws

THE OTTER

(Both these pictures are photographs of the author's pet otter, Madame Moses)

21 An old male otter

22 Otter-cubs at play

OTTERS, YOUNG AND OLD

years old, although for practical purposes they are mature at twelve months. We are in the dark as to many details of the breeding habits of the otter. Cubs have been found in all months of the year, so there is evidently no definite breeding season, but the preponderance of spring litters points to March being the most usual time. Whether the female has more than one family in the year is questioned; I feel sure she has not. The length of time she goes with young has been variously stated by different writers, a recent author placing it at 33 days, but seemingly this was a mere guess. The only reliable evidence on the point that I have been able to find concerns two otters kept by the late Mr. A. H. Cocks at Henley-on-Thames, which paired and bred. The female, after a gestation of 61 days, gave birth to two cubs on the 12th of October, 1880. These young ones were successfully reared, and one lived in Mr. Cocks' possession for ten years. He had mother and daughter—both the cubs were females—for 17¾ years. The facts were fully set forth in the *Zoologist* in 1882, but the above account is taken from a letter written by Mr. Cocks on December 3rd, 1925.

I believe this is the only instance of the otter breeding in confinement. I failed to get my otters to breed, although they lived under the most natural conditions and Madame Moses often departed for tours of the countryside. Nevertheless, and despite the fact she lived on affectionate terms with Tom, the dog-otter—his full name was Thomas Romeo Grievous Otter!—for several years up to her death in 1931, there was no result.

Although the *Mustelidæ* are not, as a family, noted for conjugal devotion, I think the otter mates for life. It is an animal of deep affection and long attachments, slow to make friends and equally slow to forget them. After Madame Moses' death at nearly eight years of age, I let Tom wander off, but he returned at intervals to visit their quarters and I often found large muddy footprints on the woodwork of the kennel in which she had slept. To reach it he had to enter the enclosed pond which had formerly been their headquarters. Yet this enduring friendship had had a slow beginning. The female was two years old when I got the young male, and her reaction on first sight of the cub was jealous fury. She flew into a passion and would have killed him on the spot. I was only just in time to grab him

and save him from her wrath. It was six months before she became reconciled to him, after which she was as friendly with him as she had previously been the reverse.

In considering the attachments of the otter and its probable marital constancy, it must be remembered that it is an exceptionally intelligent animal of much greater mental capacity than most of the mammals about us. Having had intimate experience of three otters I do not hesitate to place the species on a par with the dog, or possibly even higher. I recounted in my book on the *Intelligence of Animals*—Ch. IV, p. 233—an experiment I made to test Madame Moses' memory. "I had taught her how to get tit-bits by tugging at a dangling cord attached to a piece of cardboard placed on a fence five feet above her head. This card she pulled down and so obtained whatever was on it. Between August 6th, 1928, and October 12th, 1930, the cardboard was not used, but on the latter day I took it with me to the otter's enclosure and adjusted it on the fence while she was diving after a stick I had thrown into the pond.

"Moses came ashore, dropped the stick she had retrieved and, ignoring me, walked to the dangling string, took it in her mouth and gave it a smart tug, which brought the card and its bread and butter tumbling down. She lost no time in eating the latter. Her behaviour showed instant recognition of the card and recollection that it would carry a dainty."

The actions of Madame Moses left me without doubt that, despite a lapse of two years and two months, she remembered all about the card and its string. She demonstrated her excellent memory in many other ways, as did Miss Aaron, her sister, and Thomas, the dog-otter.

But it was in their quick grasp of a situation and their swift comprehension of difficulties that my otters best showed their abilities. Moses would follow me anywhere as long as I was going away from home, but the moment I turned about she dashed off in the opposite direction, eluding me with uncanny skill. Yet when she had been apart from me for a while she came at once to my call, climbed into my arms and pressed a broad wet muzzle against my cheek, after which she snuggled down in my arms and let me carry her home.

Although I believe the dog-otter to be devoted to his mate, I cannot gather any evidence to suggest that he shoulders

family responsibilities. Apparently the dam brings up her litter single-handed. The cubs are born blind and helpless, and do not open their eyes for some while. They grow steadily, but remain for a time in the "holt," not venturing forth until they have attained considerable activity.

The "holt," as an otter's den is termed, is usually situated in a burrow in the river bank, being either a rabbit hole enlarged and adapted, or a recess beneath the roots of some waterside tree. Occasionally a large drain, a hollow tree or some such convenient place may be utilised. In the Fen District, in the reed beds of Broadland, where burrows are difficult to find, a large nest of grass, reeds and rushes may be constructed.

Even when unburdened by family cares, the otter believes in a good couch, and whenever it sleeps makes up its bed, gathering mouthfuls of grass and rushes until it has a goodly pile on which to rest.

Many pretty stories are related concerning the ways of the mother otter and her family. It is said that the young ones are unable to swim until she teaches them, by carrying them on her back out into mid-stream, where she dives and leaves them to swim ashore. Discounting such yarns, the fact remains that juvenile otters are, unlike little ducklings, without any innate love of the water. They are very timid to begin with, paddling nervously in the shallows until they gain confidence in themselves and their powers of swimming. Then what fun they have, romping, racing and chasing, tumbling head over heels, and indulging in mock combats while the water flies far and wide!

There is probably no animal in existence so playful as the otter, which romps with such light-hearted abandon and that preserves its juvenile love of a game so long. We can truly say of it that it never grows old. My Moses remained to the last a perfect playmate, ever ready for fun, from chasing her own tail on dry land to turning catherine wheels in deep water.

The mother otter feeds her offspring, which, by the way, are usually from two to four in number, on trout, small salmon, and every other sort of fish, eels—for which otters have a passion—frogs, rabbits, moorhens, ducks and anything else she can grab.

As hinted earlier, the otter is not particular. It is wonderfully efficient when in pursuit of fish, but it has no objection

to seeking a rabbit in its burrow and fetching it forth too. An otter will eat most things, from slugs and earthworms upwards, and it only draws the line at such inedible creatures as the toad. This, however, is not from instinctive aversion, but is a matter of experience. How eagerly did my pet cubs grab the first toad they came across, how swiftly they dropped it and how they rubbed their muzzles on the turf as they tried to obliterate the painful sensation caused by the toad's acid secretion. From that time forward they were wary and cautious when they came across one of these creatures.

When the cubs get big and strong their dam leads them off up the river to explore new fishing-grounds and fresh country, for one reason because the otter is ever a restless, nomadic animal, and for another because a long residence on a stretch of water means exhaustion of its resources.

Otters rarely stay long anywhere. They move up and down the waterways, as do the tinkers and gypsies about the countryside; but just as these restless folk have their rounds and come back to the old spots, so do the otters come back to the same haunts.

For a while a given stretch of river will be devoid of any sign of otters, then suddenly footprints will appear in the mud at the water's verge and tell-tale signs will be found on the accustomed calling-places, such as ant-hills on the banks and mid-stream boulders. In addition, remains of fish and other kills will be found here and there, to tell of raids made during those quiet hours when mankind is at rest.

Although the otter is seldom seen, it is not strictly nocturnal, especially in those quiet places where it is safe from observation. The fisherman casting his fly on the placid backwater of some secluded stream may view the master of his art at work, or even catch a glimpse of otter-cubs at play: nevertheless the otter is most active under cover of darkness.

With regard to the playfulness of the otter, it is said to make a practice of tobogganing, having especially slippery banks to which it resorts for the purpose of sliding and on which it forms runways. I have never found one of these slides, but I have seen my pet otters tobogganing in the show, which they did by folding back their forepaws, throwing themselves flat and slipping head first down every bank. They loved the game. And I have tracked wild otters through the snow and have found where they did the same.

23 A CREATURE OF THE NIGHT

The badger is one of the most truly nocturnal of animals, and rarely leaves its burrow, or "sett," until dark has fallen. It was quite dark when these two came forth. The picture, obtained by a flashlight exposure, shows an adult boar and sow about to set off for their evening expedition

24 A flashlight portrait of a female badger coming forth from her "sett" and looking around

25. The footprints of a badger in the snow, showing how even severe weather did not keep it at home

But, as I have said several times already, the otter is one of the most joyous and light-hearted of animals, loving a game beyond all creatures. I have seen an otter take a fallen fir-cone, throw it aloft, pounce upon it as it fell, then throw it into the water, grab it, fling it into the air, catch it on its nose, balance it for a moment, and spin round and round with it.

High-spirits and joy in living are the outstanding characteristics of this truly British beast, which continues to haunt our waterside despite much persecution and no protection. But then, it is an animal of intelligence and understanding, and peculiarly well able to take care of itself. Even in the midst of its gayest game it keeps a cautious look-out.

From the lively, spritely, quick-witted otter, of graceful movement and sinuous shape, to the solid sober badger, may seem a far step, but in fact the two are comparatively near allies and have a good deal in common. Structurally *Meles meles* is a true weasel. It was formerly thought that the badger belonged to the bear family, yet, in fact, it has no connection with that group, being quite distinct from the bears.

The genus *Meles* is widely distributed throughout the Old and New Worlds, and our species ranges from Ireland eastwards throughout Europe into Asia, mostly in the same guise as we know it here, though zoological experts have differentiated a few geographic races which they have distinguished by sub-specific titles.

The badger, like the otter, is one of the oldest members of our fauna, a truly indigenous inhabitant of our countryside, and no comparatively recent addition, as is the fallow deer, said to have been imported by the Romans, or the brown rat which supplanted the black rat about the time of the early Georges.

The long association of the badger with the English countryside is shown in the frequent appearance of its Saxon designation in place names. There are many "Brocktons" and such-like names up and down the land; yet the badger has ever been a harried and persecuted animal, with most men's hands against it and favoured by few. In days gone by it was a victim of badger-baiting with dogs, when the wretched animal was put in a tub and terriers set upon it. It always put up a stout defence, having an amazingly thick skin and being capable of inflicting a truly terrible bite.

If you examine the skull of an adult you will find that the lower jaw-bones are so hinged to the skull that it is almost

impossible to dislocate them, also there is such a strong bony ridge along the top of the skull that the animal takes little hurt from even a severe blow on the head. However, the nasal bones are comparatively fragile, and a sharp tap on the nose is often fatal.

Man is practically the only foe the badger has in our modern England. It is viewed with respect by its neighbours of the wild, and animals such as the fox abstain from interference.

Now and again badgers and foxes will be found lodging in the opposite extremes of some enormous old badger earth or "sett,"* but in these cases the foxes are intruders liable to be ejected should their presence become a nuisance.

The badger is a great digger; its strong forepaws, with their stout claws, enable it to scrape out lengthy tunnels that go far underground. Long-established burrows, ancestral mansions which have been handed on from generation to generation, are often of extraordinary extent, as the excavated soil piled before the entrances bears silent but, none the less, eloquent testimony.

I remember a case when a pack of hounds ran a fox to ground in a very big badger sett, and, the foxes having done much damage among the poultry around, the Master said he would dig for the fox. A stout gang of men set to work. They dug until evening, they dug all next day, and revealed tunnels running in tiers in many directions. On the third day they found themselves confronted by many more shafts and had to own defeat, leaving the fox still in its refuge.

This sett had been dug in a layer of sand between strata of clay, which is a favourite type of location for a badger earth. In the district where I have studied badgers most, an area of south Shropshire known as the Wheatland country, the setts are usually in the woodlands, though here and there one may be found in a more open situation.

Forty years ago the badger was a comparatively scarce animal in this district, but it has been quietly and steadily increasing until now it is numerous, so that in the winter of 1934-35, when I made a careful examination of a number of the earths, I estimated the badger population of this eighty-five square miles of country at one hundred pairs or more.

Yet the badger is the most elusive of mammals, being seldom seen abroad by day and only at night by those who watch for

* This is sometimes written "set", also "cete", but the latter rendering, which is a very old one, seems to be in reality a company term. Dame Juliana Berners in the Boke of St. Albans (1486) mentions "a cete of graies".

it. Strictly nocturnal, shy and retiring, it rarely comes out until after dark and has disappeared before the sun is up. It usually goes to ground for the day, though occasionally it will curl itself up in a thick brake. Several cases have come under my notice. These were three-parts-grown cubs.

The cubs are born between the beginning of February and the end of March, and are usually two or three in number. Larger litters are exceptional, though I have seen a flashlight photograph of a family of five. They are blind and helpless to begin with and do not attempt to move from the great sett for some time. The sow-badger does her utmost for their comfort. She prepares a splendid bed. For weeks before the cubs are born she scrapes and scratches, clearing all old bedding out of the sett and drawing in much new stuff, dry grass, dead fern and so on. Ever a "good housekeeper," at this season her passion for homemaking is trebled, and affords a marked contrast to the haphazard methods of the vixen, which latter never troubles to carry in bedmaking material.

As the badger cubs grow big and strong they become more adventurous, coming not only to the mouth of the hole, but out into the open to play around.

One of the most delightful wild life scenes I have witnessed was at daybreak on a summer morning when I watched two cubs romping before their home. They raced and chased, they tumbled one another head over heels, and were so intent on their fun that they played on while the sun rose, birds left their roosting places, songs came from the trees, and the sound of cattle grazing came from the fields. One almost ran into me, when it had a real shock—so great a fright that it did not pause to warn its fellow, but tumbled down the nearest hole. Its comrade went on scratching about in the undergrowth until it too became aware of my presence, when, with a startled grunt, it likewise bolted underground.

It was curious to note how these romping cubs displayed emotion by means of their fur, fluffing out their tails, putting their jackets on end and so on, according to the amount of excitement they felt. I noted the same thing in the case of the pet badger I had. Diana was great friends with the dogs, often playing boisterously with them, and I could always tell her state of mind by the way she erected her fur.

Badgers when taken young and reared by hand become very tame and affectionate, though they are usually "one person

pets." I have known several, all of which were charming characters, perhaps the most outstanding being the Countess of Essex's Wenty. Lady Essex brought her up as a member of the household, feeding in the kitchen and coming into the sitting-rooms to sleep in the armchairs, but as she grew older she made herself a burrow in the shrubbery and eventually went off to the hills.

Another outstanding pet badger was the albino—it was pure white with pink eyes—owned by Mrs. Milward of Clifton-on-Teme, that also came indoors and, indeed, lived in the sitting-room.

Albino badgers are very rare, but erythristic varieties occur now and again. In individuals of the latter type all the parts normally grey or black become sandy-brown. A fine sow-badger I saw of this colour had two cubs of normal hue.

Although the badger is a common British mammal, our knowledge of it is far from complete. It is uncertain when it mates, nor is anyone sure how long the female goes with young. It is my opinion that mating takes place in the early Autumn, which makes gestation from five to six months, but many persons aver that it occurs soon after the young are born, and that the period is ten to eleven months.* Other naturalists go farther and declare that the period is variable, that gestation can be suspended, and a female may carry her young for a yet longer period.

I question both these latter theories, and believe that the fiendish din we hear in September and October is the love-song of the badger. What a noise it is! The vixen's scream is nothing to the awful cry of the badger, for the latter keeps it up, screaming again and again.

One evening the badgers which dwell in the wood near my home made the autumn evening hideous with their cries, and so upset a neighbour that he could hardly believe the noise was made by animals. He was convinced some terrible crime had been perpetrated and that the screams were those of the victim.

With regard to the mysteries of the badger, it is difficult to say what it really lives upon. Such a bulky animal must need a good deal of food. The average weight of a male badger is from 25 to 30 lbs., and of a female from 18 to 25 lbs., but both sexes may be

* On August 13th, 1943 when badger-watching in the early evening in the Caughley Woods, Shropshire, with a badger family playing about me, I saw, at a distance of no more than six feet, pairing take place between the two adults.

much heavier; a fat sow pulling down the scales until they show 40 lbs. or more, and a large stout boar being proportionately heavier. A bulky frame such as this needs nourishment, and the owner cannot afford to be too particular. Frogs, snakes, slugs, worms and such things are not despised. Wasps' and bees' nests are much appreciated, indeed wasp nests are frequently dug out, their wreck telling of the badger's immunity or indifference to wasp stings and its delight in the wasp comb and its contents. In the springtime little rabbits are dug from their hidden nurseries. The badger with its keen nose locates them from above ground and then scratches down upon them. Adult rabbits are not despised, at least not when they can be obtained easily, as in a rabbit-catcher's snares. Rabbit-catchers often complain bitterly, and with good reason, of the depredations of "brock." It will pull rabbit after rabbit out of the "wires" and leave only skins turned neatly inside out. This is the mark of the badger and distinguishes its work from that of a fox, but, where food has been carried home to the earth, credit—or blame—can be certainly assigned to the fox, for the badger eats what it wants on the spot and carries nothing away. The badger often gets the blame for things really attributable to the fox, such as taking game-birds off their nests. For over forty years badgers have been numerous around my home, having their headquarters in a wood about 500 yards from the house, and never once have I found any trace of them interfering with game in any manner whatever.

But exceptional badgers will undoubtedly rob nests of pheasants and partridges, also raid fowl-pens and kill hens. I have known of a badger being caught in the act, *i.e.*, in the poultry house with dead fowls strewn around it. However, the actions of such individuals are no more typical of ordinary badger conduct than are the evil deeds of a human criminal typical of average human behaviour. These "crimes" probably arise from a fairly numerous population of badgers and difficulty in finding food. The question is whether, with badgers steadily increasing, "crimes" may not become more frequent.

Thanks to the more enlightened attitude now prevalent towards wild animals, the badger meets with toleration in many quarters where it used to find active enmity, and having no foe except man, is not only increasing and spreading in all suitable parts of Britain, but looks like continuing to do so.

Where any mammal becomes too numerous Nature is quick to apply her own checks. Disease breaks out and reduces its numbers, but the badger seems a particularly healthy animal. I have known a captive badger die of a throat complaint with symptoms similar to those of acute tonsillitis, but this is the only instance of a badger dying of any complaint that has come under my notice. I once found one curled up dead under a bush in the heart of a big wood near a large sett. It showed no signs of violence and appeared to have died of senile decay. It was a big old male without a sound tooth left, its teeth being all worn down to the gums. What its age may have been it is impossible to say, perhaps fourteen years or so, possibly more.

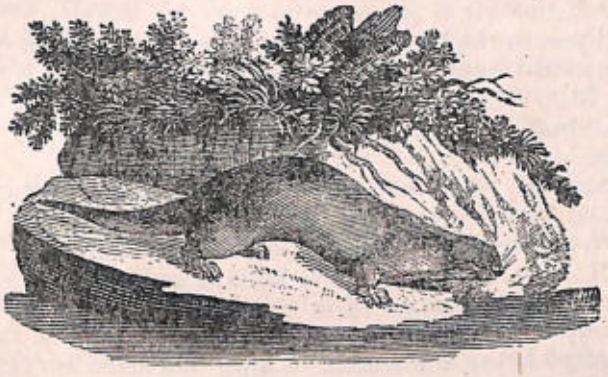
With regard to the badger's high resistance to disease, I have never seen one suffering from mange even when mange occurs in the fox population; but its cleanly habits probably assist it to keep free from this scourge. I am convinced that a goodly population of badgers prevents mange among the foxes, because they clean out the fox earths, which otherwise remain in a most insanitary condition.

Apropos of matters sanitary, the badger, like the cat, usually scratches a shallow hole for its excrement, but unlike the cat does not cover it up. Very often badgers resort to a particular spot near the earth, and I have seen a side-shaft down one of the tunnels of the sett used as a closet, though I believe this to be unusual.

Details of the domestic life of *Meles meles* are difficult to find out, but it seems that badgers pair, probably until death or circumstances divorce them, and each couple occupies an earth, unless it is so large that there is room for two pairs. Where more than two badgers are found in a sett the others usually consist of young ones, which certainly stay in the old home until full-grown, and probably until turned out by the parents.

In the early spring it is not uncommon to find the old male lodging out, that is, in temporary quarters such as a dry drain near the home sett, from which I conclude that the sow evicts him before the cubs are born and keeps him at a distance while they are small. But, like so much else concerning this mysterious animal of the night, we are merely indulging in supposition, based on indication rather than positive evidence.

We boast of the advancement of every branch of science, but there is yet much to be done to fill in the gaps concerning our knowledge of the life stories of the common animals of the countryside, and the badger remains a fruitful field for investigation.



THE OTTER.

CHAPTER IV

The Weasels

In addition to the badger and otter, we have the pine marten, polecat, stoat and weasel to represent the family *Mustelidæ* in the British Isles. The first two are rare refugees in remote places, but the latter are widespread throughout Great Britain.

The weasel, *Mustela nivalis nivalis*, is that tiny sandy-hued sprite, smallest of the tribe, hardly more than a finger thickness of vitality and devilment, which hunts the voles in the grass of meadow, moorland and hillside, and which may sometimes be seen dancing upon the lawn. All the *Mustelidæ* are lively, high-spirited creatures, but not one of them is more playful than the weasel. I once watched a small female making feints at a party of wagtails which were disporting themselves on the grass. The birds were well aware of what the weasel was trying to do, and the weasel must have known it had no chance of making a capture, but for ten minutes or more it amused itself by making rushes at the nearest wagtail, darting back to cover in some long grass, running forth again to dance and caper and enjoy itself in the sunshine.

The weasel lives principally on mice and voles. I have not seen one kill a shrew, but these little animals are distasteful to most carnivorous mammals. I have, however, known a weasel kill young rats, indeed quite sizable ones. Of course, a full-grown rat is a formidable monster to a weasel. Even the largest of male weasels rarely exceeds eleven inches in length, tail included, while the female is but nine inches long from nose tip to tail tip. However, she is the most indomitable and plucky of animals. Tales are told, seemingly well-authenticated, of female weasels with young to defend even attacking human beings.

Though an adult rat is not within the scope of the average weasel under ordinary circumstances, nevertheless the weasel is a valuable visitor to the farmstead and a most useful creature in field and wood, where it does much good by keeping down

the numbers of injurious small rodents—a good which far exceeds such occasional misdeeds as the looting of tiny game-chicks.

The weasel, though often confused with its bigger cousin, the stoat, is easily distinguished. It is not only much smaller, more sandy in colour, but its short, somewhat stumpy tail is never decorated with the dark tip characteristic of the stoat. The black "pencil" at the end of the tail is the unfailing distinction of the latter. Although the stoat often changes into a winter coat of white, white weasels are rare in Britain, and when met with are usually albinos.

The weasel is not found in Ireland, where this name is frequently given to the stoat, but it is well distributed throughout England, Scotland and Wales. Although it occurs on some of our islands it does not show any differentiation into sub-species such as we find in the case of certain of our small mammals.

Young weasels appear in the early summer being reared in some well-hidden hole and fondly looked after by their dam, which, as already remarked, is the most plucky of wee creatures and will dare much on their behalf.

But we must leave this tiny hunter of ditch, meadow and coppice, this relentless pursuer of mice, and proceed to a hunter of bigger quarry, namely, that terror of rabbits, the stoat.

Scientists recognise three stoats in the British Isles: *Mustela erminae stabilis* the common stoat of England, Wales and Scotland; *M. e. ricina*, found only on Islay and Jura in the Hebrides; and *M. hibernica*, peculiar to Ireland and the Isle of Man. This latter is smaller than the common stoat, with less white—or cream—on its under-parts. The Islay stoat is also smaller than *M. e. stabilis*, but the differences on account of which it has been ranked as a sub-species are inconspicuous cranial ones. To the non-expert it looks much like the stoat we see hanging from the gamekeeper's gibbet in an English wood, and all three stoats are so similar in character and habits that the following remarks may be read as applying to all.

Wherever it occurs, the stoat meets with a determined foe in the keeper, who regards it as the worst of vermin, and pursues it relentlessly with trap and gun. It is, of course, a very predatory animal, hunting not only from need, but for sport. It will kill a rabbit, leave it and race on to run another

down, slaying the next with the same quick bite at the back of the neck which pierces the spinal column. Perhaps this victim will also be left, while the fierce little hunter gallops off to enjoy the chase of a third rabbit.

The manner in which rabbits slain by a stoat are left lying around with merely one small wound in the neck has led many persons to suppose that a stoat "sucks the blood" of its prey, but this is not so, for it eats the meat in the ordinary manner and, when rabbits are scarce, will return again and again to its kill. I have surprised a stoat inside a rabbit. It had begun at the neck, worked backwards and hollowed out the carcase. It was the stoat's tail protruding from the rabbit's neck and jerking to and fro that caught my eye. I walked up to see what was going on. Out sprang the stoat with a startled hiss, and a whiff of its pungent protective odour came to my nose as it galloped off.

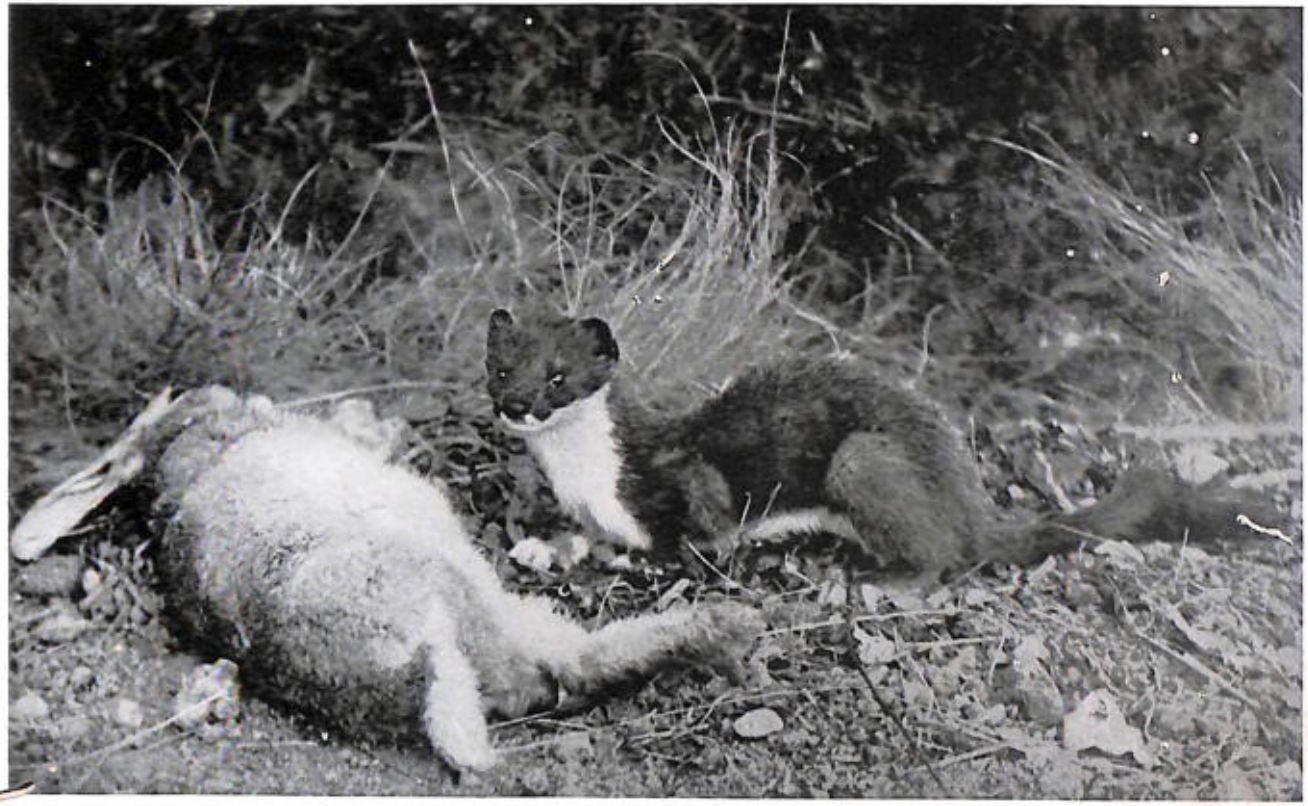
Many members of the *Mustelidæ* have the power to emit, under stress of necessity, an evil-smelling secretion from a pair of anal glands. This power is well developed in the case of the stoat, which can make a horrible stink. I have seen a terrier, in the act of grabbing at a stoat, stop short, evidently checked by the smell, and by this hesitation give the little animal time to get away. Likewise I have seen dogs seize and kill stoats despite the smell, their excitement rendering them oblivious to it; but I believe, nevertheless, it has definite protective value.

The chief enemy of the stoat in Britain is, as I have said, the gamekeeper, but seeing that rabbits are its principal source of sustenance, and seeing what a menace the rabbit is to agriculture, we may question whether it deserves such severe persecution. However, it manages to withstand the warfare waged upon it, and exists in fair numbers, despite having only one litter per annum to make good its losses. Some five or six young ones are born in a secluded hole during April or May, and follow their mother out into the world towards the end of June or the beginning of July.

A stoat family "on the warpath" is an interesting but rather uncanny spectacle. I watched a party running up a dry ditch across a meadow, and the ground seemed to be alive with the nimble, active creatures. The grass squirmed with them, beady dark eyes appeared first here, then there, white fronts gleamed as their inquisitive owners sat up to get a better look

26 THE WEASEL

The weasel, little bigger than the mice it hunts, is a notable inhabitant of hedge-bank and thicket, from the shelter of which it raids the voles in the meadows and the long-tailed mice wherever they may lurk. It is smaller and more sandy in hue than the stoat



27 A STOAT WITH A RABBIT

The stoat, a mighty hunter of rabbits, may always be known from the smaller weasel by its browner coloration, bigger ears, more extensive cream front, and the dark pencil of long hairs at the end of its tail. Its tail, too, is much longer in proportion to the length of its head and body than is the case with the weasel

at me, and black tail-tips flicked as the stoats galloped off. I was quite glad to see them go !

There are many stories of stoats "hypnotising" and "mesmerising" their victims, but I think these yarns are based on a misinterpretation of what is seen. Like all its tribe, the stoat is an exceedingly high-spirited, playful animal, young individuals are bubbling over with the joy of life, and this leads them to indulge in queer antics at times, such as dancing and capering like creatures possessed. But rabbit psychology is very strange. A rabbit that knows a stoat is on its trail becomes so silly with terror that it sits down and awaits its doom; yet I have seen rabbits feeding unperturbed with a stoat romping near, and I have likewise seen them nibbling grass with a black cat in full view trying to creep up within pouncing distance. They merely kept hopping out of reach. Perhaps they knew the stoat was not hunting; puss however meant mischief, yet they treated its attentions with nonchalance.

Although the stoat of the northern parts of the Continent always turns white in winter, becoming the highly-prized ermine, of snowy hue save for its dark tail-tip, the British stoat is variable in this respect. In Scotland white individuals are comparatively frequent, but in England tney are less often met with. It is a curious fact that females are more prone to the winter change than males. In the Irish stoat the alteration is rare, a fact which no doubt has relation to the mild winters enjoyed across St. George's Channel, for a white stoat in green surroundings is a conspicuous object, as I thought when I watched one disporting itself on a sunny winter day beside an English coppice. It looked perfectly dazzling in its regal furs, and I was sorry when it vanished in the undergrowth.

From animals of everyday occurrence, which we may meet at any time when out for a walk, we pass on to those rarities, the polecat and the pine marten, known to scientists as *Mustela putorius putorius* and *Martes martes martes*.

Both were formerly common creatures of the countryside, the polecat surpassing the stoat as a hunter of rabbits, while the pine marten caught birds and pursued the squirrel through its tree-top world. But the days when a "marten cat" might be seen of a morning sitting on the park palings, drying its fur and sunning itself after its night's hunting, have long been gone. Few persons now know what manner of animal the

pine marten may be, and the same applies to the polecat. Although there was a time when rewards were paid and entered on parish registers for the destruction of "sweetmarts," "foumarts," "fiches" and "fitchets," there is no fear now of either pine marten or polecat doing damage in any English fowl-pen.

The pine marten has become very rare in Great Britain. A few specimens are scattered in the mountain valleys of the Scottish Highlands, and one or two survived until recently on the Lakeland Fells, but I have been unable to get any trustworthy evidence that they are still there. There are rumours of martens in Wales, especially in north-central Wales, but confusion with a red variety of the polecat which occurs here is a possibility which cannot be overlooked. The only place where the marten seems to be maintaining itself is in the west of Ireland, and here there are still a fair number in the wilder parts.

Now to describe this creature with which so few are acquainted; the reader should picture an animal about the size of a small cat, but of stoat-like shape, with a brush like a squirrel, a face like a little fox, a coat of rich chocolate hue, and a throat-patch of cream. Imagine it as remarkably graceful and nimble, with an expression of intelligent curiosity, and you will have some idea of a most beautiful being; but only personal experience can bring realisation of the marten's charming character and personality.

I once had a female marten. The Mart, as she was called, came into my hands as a tiny kitten and grew up into the most affectionate and delightful of pets. She was never so happy as when having a good romp, yet however fast and furious the fun, she was most careful not to be rough, and never made a mistake or nipped too hard. She loved to take a flying leap on to my head and hang round my neck as a living, warm, soft, fur wrap, before sliding head-first down my arm, leaping to the ground and climbing back again. She delighted in being with me and cried sorrowfully when I left her.

The Mart was more active than any squirrel. She could run upside down on the underside of the wire-netting roof of her quarters, and never failed to do so when a cat strolled over head. She did not like cats, and when a cat got on the roof she always jumped up and nipped its toes through the wire. The cat invariably gave a startled mew and leapt off the roof.

The marten did not like dogs either, but she was more cautious with them, contenting herself with making growling sounds and wagging her thick tail.

Her appearance varied much with the season. In summer she looked smaller, slimmer and darker. In winter she donned a lovely thick coat, and her throat patch became of an orange-peach tint. This exquisite hue soon faded, as did the rest of her chocolate jacket, and by spring she was a pallid version of her lovely self.

A marten's coat bleaches readily, hence museum specimens give little idea of the live animal and are merely faded remnants with but small likeness to the original.

Seasonal differences at one time led people to believe that we had two martens in Britain, the beech as well as the pine marten, but it is now known that the beech marten, *Martes fiona*, which occurs on the Continent, has never extended its range to the British Isles.

In early days, when the marten was common, it was known in the South as the "marten cat" and in the north as the "sweetmart." The latter name was given it as a distinction from the polecat which was called the "foumart" or "foul-smelling marten" on account of its power, like the stoat, to emit a horrible odour when in difficulties. The marten does not make an objectionable smell, though it has a curious and distinctive aroma which is instantly recognisable. In old hunting books it is said that foxhounds were very fond of this "sweet scent" and would follow it eagerly, and I have talked with natives of Cumberland who have assured me that they had, in their young days, seen martens hunted for miles over the Fells.

In the Lake District the marten usually had its young, there being two or three kittens in a litter, in a hole in the crags, but in wooded districts a hollow tree, an old crow or magpie nest, or some similar retreat, generally served as a nursery.

The little things, which are born blind and helpless, have a whitish coat to begin with, but they soon acquire a dark jacket and then become active and adventurous.

As there is only one litter per annum, and that is not a large one, the marten soon becomes reduced in numbers where subject to much persecution. Owing to its enquiring disposition it is particularly easy to trap and shoot. It must

investigate anything strange, even a trap, so it has little chance where rabbit-catchers ply their business, or where the gamekeeper seeks to destroy vermin.

A native of the Fell District said he attributed the virtual disappearance of the pine marten from Westmorland and Cumberland to the increase of the rabbit. In his young days rabbits were very few and "marts" were comparatively common, but rabbits gradually increased and spread from the low ground far up the fell-sides, until at the present time they are exceedingly numerous and intensive rabbit-catching is a necessity—with fatal results to the martens.

From the "sweetmart" let us now turn to the "foumart," which, like the marten, though once widespread on the mainland of Great Britain, is now an outlaw of the remote mountains.

The polecat has but one sanctuary and that is on the coastal pleateau of north-central Wales. Polecats from other districts than Wales nearly always turn out to be gone-wild ferrets of a dark colour.

The polecat is like a ferret of the "fitchet" type, but darker and handsomer, and usually slightly larger. It is generally stated that the ferret is a domesticated form of *Mustela putorius putorius*, the polecat found in Great Britain but not in Ireland, and that the cream-coloured ferret we know so well is an albinistic variety. But doubt has been thrown on their mutual identity on the ground of cranial differences, and the suggestion has been made that the ferret may trace back to the Asiatic polecat and have been brought here by the Romans.

Howsoever this may be, the polecat and the dark-coloured ferret are creatures of similar type. Those who have never seen a polecat may visualise it as a larger, rich-coloured ferret, with well-defined facial markings of white on an almost black ground. But it is quicker and more intensely alive than any ferret, being a creature of great activity and vitality.

Many years ago I obtained a male polecat from Wales and he became friendly with a female ferret, with whom he mated. She was an ordinary cream-coloured, pink-eyed albino. In due course she gave birth to a litter of five young ones, which early showed the dominance of the wild type. Although born with a scanty covering of milk-white hairs, they soon acquired dark coats and became perfect little polecats, exactly like their sire in all respects, though from being handled and petted

from the beginning they were exceedingly tame. Yet they were always nervous and liable to take alarm.

As I mentioned earlier, the polecat has the power to emit a powerful and horrible odour when in difficulties, and these hybrids several times gave me a whiff of this protective stink, which seemed to be well up to specific standard. At any rate, when I got it on a coat, it took a long time to get rid of it.

The youngsters were very lively and playful, and to watch them romping together was a joy indeed. They hopped, skipped and rolled in a delightful manner.

I kept the finest male, known as Billie Polecat, for four years until he died of a throat complaint, and he was a great pet; yet he was sometimes a nuisance. Unless taken out rabbiting and given plenty of work he turned his energies to escaping from his quarters and going off to have a good time, and when he meant to get out no wire-netting would keep him at home. He spent one night in a fowl-house, with consequences that left me with no doubt as to the reason why church wardens in days gone by offered rewards for the destruction of "fitchets."

The polecat *is* a very predatory animal, and when it gets the chance it kills regardless of whether its victims wear fur or feathers. Rabbits are its staple food, but it will take leverets, grab birds, and seize anything it can. Such lowly things as frogs are not despised, indeed, they are eaten greedily, and I suspect they figure prominently on its menu.

Polecats are fond of the type of ground where frogs are to be found. They do not haunt the stony heights, but prefer the marshy valleys between the hills. There are two great bogs in Cardiganshire which are noted strongholds of this animal. The one is Borth Bog north of Aberystwyth, and the other is Tregaron Bog south of that town. Here, amid the banks and ditches where rushes, heather and bog-myrtle alternate, the polecat finds conditions exactly to its liking, and not only holds out, but has much increased during recent years.

Thirty or forty years ago polecats had become very scarce even in Central Wales, but, like the wild cats in Scotland, they have regained their footing and are in no immediate danger in this area. The policy of the Forestry Commissioners, who have planted large areas with young conifers and thus provided thick plantations where there is plenty of shelter, has also helped the polecats, which find a refuge in these places

and live happily beneath the thick growth of grass and brambles that springs up around the newly-planted trees.

Such plantations, with young trees and thick undergrowth, do not please the marten. It likes open woodlands with tall old trees in which it can disport itself. The polecat is terrestial in its tastes, but the pine marten is really of arboreal habits, though the force of circumstances in Great Britain has sent it to the crags and rocky hillsides, where it can, however, make use of its amazing agility upon precipices and ledges.

The status of the pine marten in Wales is doubtful. That it formerly existed there is certain, but whether a few individuals still survive is less sure.

Now and again a red form of the polecat occurs. This is an erythristic variety in which all the parts normally black-brown become of a sandy hue. In a specimen in my possession the markings are present as in an ordinary polecat, but are not so conspicuous because they are on a lighter ground. In the distance the animal might well be mistaken for a marten, particularly by anyone not intimately acquainted with the two species.

"Red" polecats are reported at intervals from Borth, Tregaron and other parts of the Cardiganshire plateau which is the stronghold of this animal, and the variety seems to be of fairly frequent appearance. As said earlier, the Welsh polecats are all that remain to us of the once widespread "fitchet." The "foumart" has gone from the Lake country, and is unknown in Scotland, but here and there escaped ferrets take comfortably to a wild life and give rise to reports of polecats in unexpected localities. However, careful examination of such specimens soon shows that we are not dealing with the real thing.

The question arises, with regard to rare animals such as the polecat and pine marten, whether some measure of protection could not be extended to them. It is often said that a National Park would be the saving of such creatures, but it is doubtful if it would be of any benefit to these two animals.

The marten is of a remarkably restless, nomadic temperament, in this respect being like that other member of the *Mustelidæ*, the otter, and as the otter wanders up and down our waterways, so does the marten traverse the country-side, restlessly exploring every nook and corner to see what it can find.

28 THE PINE MARTEN

The pine marten, once common in our woodlands, is now one of the rarest of British mammals. This picture shows a Lakeland female in winter coat, with a full brush, a jacket of soft, dense, chocolate-brown hair, and a throat-patch of cream fused with orange

29 A young female in summer coat, which is shorter and darker than that of winter

30 Enquiry! A marten looking around with the curiosity of its kind

31 An old male polecat in full winter coat

32 A Welsh polecat, showing the cream facial markings

THE WELSH POLECAT

33 A mole "palace," or living place, dug open to show the nest beneath the heap of earth

34 Evidence of underground activity. Mole-hills dotting the turf of a meadow

MOLE WORKINGS

It has been recorded that a marten's footprints in the snow were followed for fifteen miles over hill and dale, this journey representing no more than a night's travelling. An animal of such activity cannot be relied upon to stay within a sanctuary—very much the reverse; hence no National Park, unless of great extent (which in our cramped Britain is hardly practicable), is of much use to it.

Apropos of the marten's trail in the snow, my pet Mart adored snow and loved to play in it, getting the greatest enjoyment from patting snowballs about.

With regard to protection of the marten, it, of course, takes toll of various birds, particularly in the nesting season, in addition to capturing ground game such as rabbits, mice and so on. It is, however, most catholic in its tastes, and will even take trout out of shallow water, such as the crystal-clear stream of a mountain burn. It likes sweet things, too, including honey and fruit. The Mart would "sell her soul" for a date and loved jam, which she would lick from my fingers with the utmost care. It is said that the continental beech marten often visits vineyards and helps itself to the grapes. This I can well believe after my experience with the pine marten.

It certainly seems a great pity that this beautiful and attractive animal should be allowed to dwindle away, and I doubt if a few martens about our countryside would have much effect on our stock of game-birds.

All predatory animals help to maintain a healthy balance of life, and the stoat, weasel, pine marten and polecat have their long-established place in our fauna. The rabbit is a menace to agriculture. It has increased and spread enormously during recent years, having in most districts insufficient natural foes to act as any check upon it. Were polecats and martens with us once more, and if the stoat was allowed to do its utmost, it is not too much to say that there would soon be a diminution in the stock of rabbits.

CHAPTER V

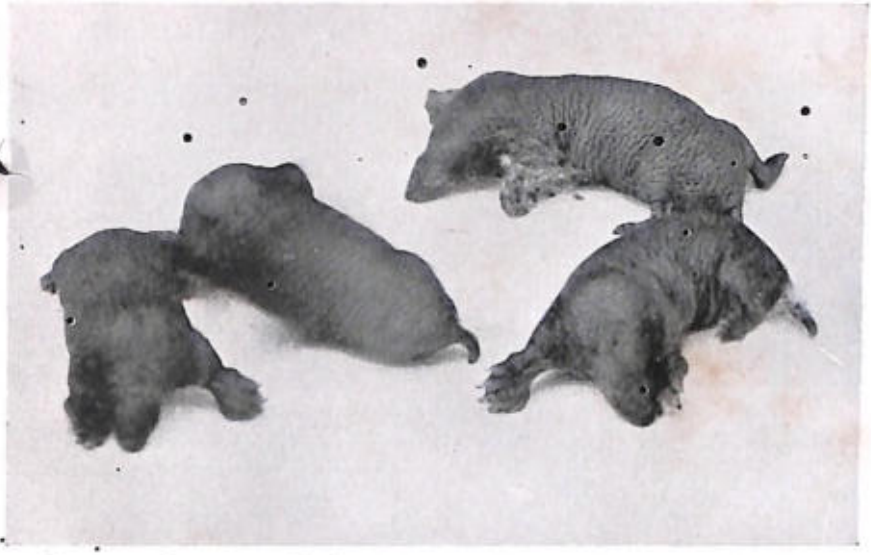
The Hedgehog, Mole and Shrews

THE British members of the order *Insectivora* number but seven species. However, all seven are creatures of remarkable interest, from that queer little animal, the common shrew, and the extraordinarily specialised mole, to that quaint beast, the hedgehog, in its jacket of spines.

Although the least frequently seen of the animals mentioned above, the mole is certainly the one most in evidence throughout England, most parts of Wales, the Lowlands of Scotland, and even some parts of the Highlands. Traces of its activities may be observed in nearly every field. Hillocks of soil, thrown up on to the surface by the mole in the course of its underground workings, tell of a numerous population tunnelling beneath the surface.

Talpa europæa, although so plentiful in Great Britain, does not extend its range westward across the Irish Channel. It is unknown in Ireland. However, it is widely distributed on the Continent, where it, and closely allied forms, carry on mining operations throughout temperate Europe and far eastwards across Asia, it being ever the same velvet-coated, dark-grey, cylindrically-shaped small beast.

The mole is marvellously adapted for a subterranean life. Its velvet coat has no "set" in any particular direction, and the wearer can go to and fro—the mole can run backwards with great ease—through the soil without getting its jacket dirty. Its body, as said, is cylindrical and fits its tunnels as a tube train fits the London tube tunnels. Its short legs and strong feet enable it to get leverage upon the walls of the passages, while its forepaws are the most efficient of digging and shovelling implements. These broad, strong feet are actuated by shoulder development and shoulder muscles which make the mole one of the strongest animals for its size in existence. It is almost impossible to keep a mole in your hands. It just pushes through your fingers. I have tried, and failed, to hold one. With regard to eyes and ears this mammal also



35 Young moles are usually born in May, and are naked and helpless at first

36 A mole on the surface of the ground, about to dig itself in

37 A HEDGEHOG ON THE ALERT

Although the hedgehog is best known as an inanimate ball of prickles, it is, when unalarmed, a keen, alert, little beast, and this picture shows its sharp eyes and sensitive snout. It has an excellent nose, fair eyesight, and good hearing. This one is obviously listening

exhibits adaptation. It has no external ears, though it can hear well, the ears being buried beneath the short, thick, silky fur; nor has it any visible eyes. The mole is for practical purposes blind, its eyes being reduced to mere vestiges. If you examine a mole carefully, parting the velvet between the snout and the top of its head, you will find on either side of the face a dark speck, no bigger than a pinhead. These specks are its eyes, so minute as to be of no real use. They may serve to distinguish light from darkness and warn their owner when it emerges from the safety of its tunnel into the blaze of upper day, but as organs of ordinary sight they have long ceased to function.

Yet this blind dweller below ground is no slothful dullard, but a mammal of intense activity, keen appetite, swift motion and great pugnacity. It races up and down its subterranean ways, digging new tunnels, throwing up heap after heap of soil, and seeking eagerly for the earthworms which are its staple food. Of these it devours an incredible quantity. If it cannot get sufficient it quickly starves.

The mole is reputed exceedingly difficult to keep alive in captivity. I have had no trouble, however, in keeping a mole as long as I wished, except for the food problem. Provided one can supply the needed worms, a mole will flourish in a cage, but let the supply fall short, even for a few hours, and the ravenous little animal is soon dead. My moles usually consumed sixty fair-sized earthworms apiece in twenty-four hours. These weighed on an average three ounces, which is the usual weight of a mole, so that each mole ate its own weight of food in a night and day.

Although I have written of "moles" in the plural, as if I have kept a number at the one time, this is not so, the difficulty of getting the required worms being too great. I contented myself with keeping several at different times and releasing each after studying it for a short while. To prove that a mole can be kept healthy and well for any reasonable period, I said I would keep one for six weeks, but long before the six weeks was up I bitterly regretted my vow. Worms were the trouble. For the first ten days it was not so difficult. There was plenty of good worm ground to be dug over in the kitchen-garden, but after that the problem grew more and more acute, and try as I would I could not find any substitute for worms. The mole was offered tiny bits of raw beef, pieces of liver

morsels of cheese, and everything likely and unlikely which might possibly tempt it, but it was no good.

The little animal lived in a glass-sided cage, formerly an aquarium, which was furnished with several inches of earth and a plentiful supply of dry grass and dead leaves. With this material it made itself a comfortable bed, in which it rested between bouts of activity, when it went round and round, heaving up the earth and seeking worms. It was fed at frequent intervals, and soon learnt to associate a tap on the glass with coming worms. It lost all fear, and would thrust forth a pink quivering nose to grab the gift I dangled overhead. The worm was soon munched up, and out came the mole to seek another. It was indeed an insatiable animal, and only once or twice did I succeed in stuffing it to repletion, yet so swift was its digestion that after a short nap it was as hungry as ever.

A previous mole had come to an untimely end because I fed it early in the evening, let it gorge itself, and omitted to see it had a good supply of worms for the night.

According to my observations, the mole works night and day alike, feeding and resting in short alternate spells throughout the twenty-four hours. When tired, it retires to its abode, which may be located by the high hillock known as the mole's "fortress" or "palace." If you open one of these "fortresses" you will find a central chamber containing a comfortable bed of grass and leaves, from which radiate many shafts that lead to the workings. There is usually a bolt-hole beneath the nest which allows the owner to make a quick get-away if danger threatens, though, apart from the farmer who detests unsightly mole-heaps upon his turf, the mole has few enemies.

Weasels are sometimes taken in mole-traps, but, I think, because they find the mole tunnels a safe and quick means of getting from one point to another rather than because they have any designs on the owners. Dogs and foxes occasionally pounce on a mole when it comes up to the surface, but the smell is displeasing and they generally roll on it and leave it. The only creature that seems habitually to prey upon moles is the buzzard, which fine bird frequently takes them home to the eyrie as food for its young. How it gets them is somewhat of a mystery, but probably it grabs them when they are ejecting earth from their tunnels.

Although the mole is so seldom seen on the surface of the

ground, when above its one idea seems to be to get back below as speedily as it can, it must come up more often than we suppose because of the material it needs for its bed, all of which has to be gathered aloft.

It was most amusing to watch my tame mole nest-making. It grabbed the stuff with quick decisive movements and tucked it in in a most determined manner. With regard to this mole and its food requirements, I offered it the head and neck of a chicken. It jumped at the head with the utmost ferocity and worried it like a little bulldog. It refused to let go and allowed me to raise it high in the air still clinging to "the enemy." It was only when it was satisfied that it had "killed" the foe that it desisted from the attack. Incidentally it did not eat any portion of the head or neck. It simply left the head and went off to seek a worm.

Following this, my brother brought a dead mole as an experiment and dangled it over the cage. In a moment our mole was out of its nest quivering with excitement, and reaching up towards the intruder. Its behaviour showed how keen a nose it had. We laid down the dead mole. At it went our mole, evidently convinced that its home was in danger of invasion, and attacked the corpse with unbelievable ferocity. It danced around, it bit and worried its passive foe in an astounding manner, the performance giving some idea of the desperate duels that must sometimes be waged under the turf of our meadows. It continued the attack until the corpse was a sorry mangled remnant.

I believe that the social system of the mole is that of the family, related individuals occupying a system of tunnels from which trespassers are vigorously ejected.

The young are born in the late spring, that is, in May and early June, and as a rule the mother prepares an especial nursery for them under an inconspicuous heap of earth away from "the palace." The young are born naked, blind and helpless, and usually number from three to five.

Reverting once more to my tame mole, it was with the utmost thankfulness that at the end of six weeks I restored it to the meadow whence it came, for the supply of worms was reduced to famine point; nevertheless I watched it disappear into the ground with regret, for it had provided me with a most interesting study and much information otherwise difficult to obtain. Henceforward I should regard a

mole, moldiwarp or unt, to mention only one or two of its countryside names, from a quite different angle.

As a rule, country names are more descriptive than those accepted for book use, but in the case of the mole's relative, the hedgehog, "hog of the hedge" does convey the appearance of the animal better than the title of "urchin," though it is by this name it is known in many of the counties of England.

The hedgehog, *Erinaceus europæus*, as already remarked, a member of the order *Insectivora*, has no affinity with the pig, but its rather long-pointed snout, and its little quick eyes, do undoubtedly give it the air of a miniature pig, that is when it is going actively about its affairs. Many persons know the hedgehog best as an inanimate ball of prickles.

This animal is unique among British mammals by reason of its spiny jacket and its ability to roll itself up into a prickly ball, by which passive defence it makes matters extremely difficult for would-be foes. There is a story that the badger has the art of unrolling an urchin, the tale being that at the approach of a badger the hedgehog recognises its helplessness and screams piteously. The badger has exceedingly strong paws armed with stout claws, and is better fitted to unroll a hedgehog than any other creature, but I have never met with any evidence that it habitually slays urchins, still less that they cry for mercy when they see it coming.

The hedgehog, perhaps because of its striking peculiarities, has ever been a centre of countryside story and legend. When it is preparing for winter, runs one tale, it seeks apples that have fallen from the trees, rolls upon them, gets them impaled on its spines and thus carries them home for winter provisions. It is, perhaps, a pity to spoil a good yarn by mentioning that the hedgehog is not a vegetarian and never looks at fruit.

It is also said to suck the milking cows as they lie asleep in the fields at night and rob them of their milk, while gamekeepers aver that it robs nests, and even raids fowl-pens.

As far as eggs are concerned, I can well believe that any hedgehog which once discovered eggs were edible would appreciate them, but I have never succeeded in getting a hedgehog to touch an egg, although I have placed eggs before captive hedgehogs and left them with them for many days.

38 A mother hedgehog with two newly born little ones. Note their milk-white spines

39 A hedgehog about to move off—but a little nervous, and ready to curl up if the need arises

40 The common shrew, one of the most numerous small animals in Britain

41 The water shrew, an inhabitant of ditches and the riverside

SHREWS

This animal is normally a grub and carrion eater, seeking in the undergrowth for worms, caterpillars, the half-rotten corpse of a rabbit left by the stoat, and such things. It has been known to grab and eat blindworms, frogs and even snakes, and will undoubtedly kill warm-blooded quarry if the opportunity arises; but this does not mean that it can cope with cocks and hens, at least, not able-bodied birds at roost on their perches.

It is a nocturnal and timid little beast, preferring to sally forth for its hunting on the dewy turf when the countryside is dim and shadowy. Then it trots about most busily, its activity being in marked contrast to the familiar motionless ball of prickles.

It is curious to reflect that this prickly jacket, which covers the upper part of the animal, its underneath, face and legs being clad with short wiry hair, provides a lurking place for parasites. Nearly every hedgehog has a surprising assortment of fleas. It is wise before taking a hedgehog home to the house or garden to give it a good dusting with insect powder, and let it rest awhile so that its population may depart.

Hedgehogs are often brought indoors to deal with cockroaches, but even if they find plenty of these they need good feeding in addition. A saucer of bread-and-milk and bits of raw meat—strips of beef will do—should be provided, also a pan of water. Some hay and dry leaves in a box will make a suitable bed, though probably not so snug as that the urchin would make for itself.

The hedgehog seeks some dry place for its headquarters, such as a rabbit-hole in a bank, beneath a stick-heap or in the heart of a pile of leaves. Here it collects grass, moss and so on, and sleeps in comfort, both during the daytime naps of summer and the long spells of its winter hibernation.

This animal is our only British member of the *Insectivora* that gets out of winter difficulties by hibernating. The delicate, fragile shrews, that live on insects, spiders and other small things, and must have great trouble in existing during hard weather, nevertheless continue their activities throughout the winter. However severe the winter, however hardly frost may press upon it, the mole too remains on the active list: it is only the hedgehog that retires to bed and stays there until conditions improve. Its hibernation is profound, and it rests in a torpid condition until the weather becomes milder and

restores it to life and consciousness. A rise in the temperature, whether seasonable or otherwise, wakes it quickly, when it emerges from its retirement for exercise and refreshment. There is no month of the year in which the hedgehog may not be seen abroad, but such excursions are brief ones, and as the thermometer falls it hurries back to its nest. As spring advances it becomes more wakeful and makes regular expeditions in search of food to still the hunger induced by long fasting.

Like all mammals that hibernate, the hedgehog gets plump in the autumn and retires with a goodly reserve of fat to sustain it while it sleeps. However, by springtime it is slender enough, and it wakes up not only hungry, but in real need of food. Feasting and mating are now its important businesses for it pairs in April and May, the first litter being born in May or June. The old hedgehogs mate again in July to August and another litter arrives in August to September. The gestation period is about 35–40 days*. The little ones may number from three up to six, but four is the most usual number. They are born complete with spines, but these are soft and of a milk-white colour to begin with, though they soon darken and harden, when the youngsters become miniature editions of their parents.

It is no uncommon sight on a July evening to see a mother urchin followed by her offspring busily questing over the turf. So long as the observer stands still and does not move the hedgehogs will bustle on, being too intent on their affairs to heed him. They hunt here and they hunt there, poking a nose into this tuft of grass, feeling beneath a dandelion, and sniffing under the next tuft of grass, all the while making queer little snuffling and champing noises, much like a number of tiny pigs sucking and eating.

Before going on to consider those small active relations of the hedgehog, the shrews, it remains to mention that *Erinaceus europæus*, unlike the mole, is found in Ireland as well as in England, Wales and Scotland. On the Continent it is widely distributed, ranging far into Asia. Local races and sub-species are differentiated here and there, but it is ever much the same animal familiar as the "urchin" of our English countryside, that animal which, at any hint of danger, rolls itself up into a ball of spines on which dogs prick their noses, usually in a vain attempt to make the animal uncurl. A mischievous boy will, however, achieve the task with ease. He merely drops the

* See "New Laboratory Animals from Wild Species", by R. M. Ranson; The Journal of Hygiene, Vol. XLI, No. 2, 30th September, 1941.

luckless hedgehog into water, when it has to unroll without delay. An urchin swims well, and will do so without compulsion. One day I was trying to take a photograph of a hedgehog near the verge of a pond, when the animal walked into the water and swam off across the pool, a distance of some twenty yards, to disappear beneath the bushes on the further bank.

The shrews, of which five species figure on the list of British mammals, have characteristics in common with both the mole and the hedgehog, but they have likewise many traits and peculiarities which are wholly their own.

The common shrew, *Sorex araneus castaneus*, is the best known of the five, it being probably the most widespread and numerous small mammal in Great Britain; yet it does not occur in Ireland, though, curiously enough, the much less plentiful pygmy shrew, *Sorex minutus*, is found there. There is also a shrew nearly related to these two, but sufficiently different to merit a specific name, called *Sorex granti*, found on the island of Islay in the Hebrides.

The water shrew, which, as its name betokens, likes damp places, is a larger shrew than any of the above and its black and white colouration makes identification easy. The common, pygmy and Islay shrews are of brownish hue, varying in shade according to the season. Except in unusual melanistic examples, which are black all over, the water shrew is jetty black above and clear white below, being a very smart little beast. Our British form, which, like the common shrew, does not extend to Ireland, is slightly different from that found on the Continent of Europe and is ranked as a subspecies; hence it bears the scientific name of *Neomys fodiens bicolor*.

In addition to the above shrews a member of the genus *Crocidura*, or white-toothed shrews, which are plentiful on the Continent, namely, *C. cassiteridum*, is found in the Scillies; but it is of the numerous widespread shrews of the mainland I want to tell now.

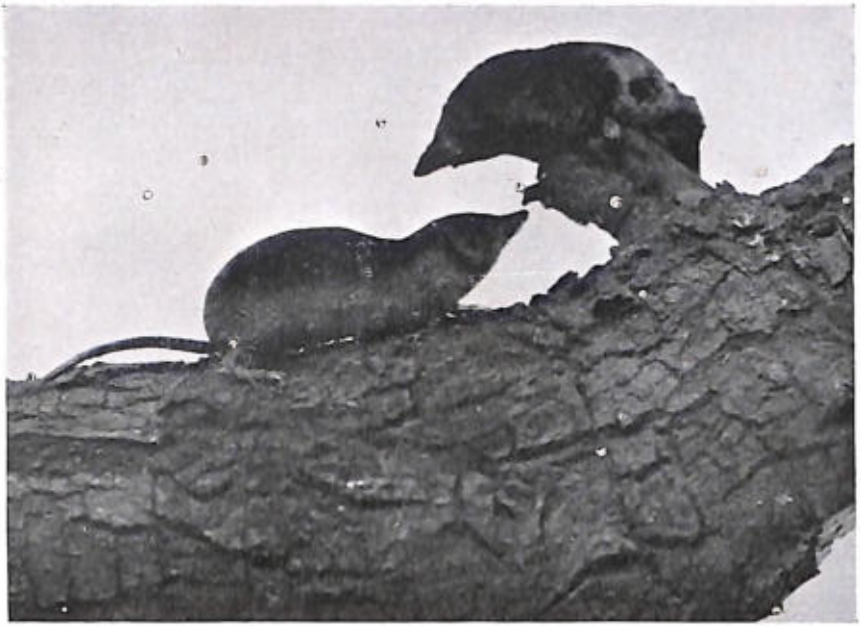
The common shrew is an exceedingly plentiful creature, being found from sea-level up to high mountain valleys, on moorlands and in woods, in ditches and in gardens; yet in life it is not so well known as it is in death. To many persons the common shrew is chiefly familiar as a scrap of inanimate velvet lying on the road, garden-path, or even on the doorstep.

In days gone by the shrew was an object of superstitious awe and hate. It was believed to be an evil beast and capable of inflicting harm on man and his domestic animals. If a "shrew-mouse" ran over the limb of a cow or horse as it lay asleep in the meadow at night the said cow or horse would be taken ill in that quarter of its body. Various weird remedies were recommended. Among other beliefs it was held that the "shrew-mouse" was unable to cross a road and live. The transit of even a path was fatal to it. In this our forebears were correct as to their observed facts, even if wrong in their deductions. It is true shrews may be seen lying dead on paths and elsewhere, particularly in the autumn, but it is not correct that they cannot survive an excursion into the open.

Naturalists have, in recent years, brought to light many interesting facts concerning the shrew, one of which is that this animal is unquestionably subject to great mortality in the late summer. Cats, dogs and foxes kill a certain number and leave them uneaten. The little animals have a strong odour which apparently renders them distasteful to animals that can smell. At any rate, both the fox and the dog often pounce on a shrew, kill it, play with the corpse, roll on it and leave it. Birds, however, are notoriously deficient in the sense of smell, and the predatory species not only kill but eat shrews with gusto. They figure largely on the bill of fare of the tawny, barn, long-eared, short-eared and little owls, also on that of the kestrel and buzzard. I have also seen shrews eaten by the magpie, jay and raven. These facts, however, do not account for all the shrews found lying about in the autumn, not only on paths, but elsewhere, anywhere indeed; but an explanation has been found, namely, that shrews, in particular the common shrew, are merely annuals. The young ones are born in the summer, flourish through the autumn and winter, come into breeding condition in the ensuing spring, and then, having reproduced their kind, become old and worn out, so that autumn finds these numerous creatures dying on all sides.

In considering this explanation we must remember that, though the shrew used to be spoken of as a "shrew-mouse" and is yet often so described, it has nothing to do with the rodents, but, as stated at the beginning of this chapter, is a member of the order *Insectivora*, which includes many fierce energetic animals.

It is fortunate for us that the shrews are but wee beasts. If lions and tigers were animated by their ferocious spirit the



42 Two pigmy or lesser shrews meet, but whether in peace or war is doubtful, for these tiny animals are fierce fighters

43 A pigmy shrew photographed with a worm beside it to show how tiny it is. This species is one of the smallest of mammals

THE PIGMY SHREW

44 TWO SEROTINE BATS

The serotine bat is regarded as an uncommon species in the British Isles, but probably occurs more frequently than is supposed in the Southern Counties. It is a sociable bat, and will congregate in considerable numbers at a favourite roosting-place

world would be no place for human beings. Even that tiny mammal, the pygmy shrew, the least of all the members of the great class *Mammalia*, which is hardly more than a pencil thickness of life and devilment, is animated by a fearless determination that must be seen to be believed.

I have watched one sally forth to pounce on a large earthworm, which to it was an immense slimy monster of great strength; but the wee hunter grabbed it by the tail, bit it and jumped back, danced around it, pounced on it, worried it and so continued until able to quiet the huge thing. The shrew then seized the worm and, with a violent effort, pulled it under the moss, where a noble feast was enjoyed. Nevertheless, within a short while, the little animal was again on the warpath.

But the ferocity of the shrew is better illustrated by its battles. It is most pugnacious, and if two strange shrews are caged together there will soon be only one. At a time when I knew little of shrews, though I was anxious to learn all that I could, two common shrews were brought to me, the first a little while before the second. Number one was already established in a glass-sided cage (lately an aquarium and furnished with moss and ferns) when number two arrived. I introduced the newcomer and immediately the first ran out to greet it with high-pitched squeaks, the cries of the shrew being exceedingly thin and shrill. The two scuttled about in and out of the moss and fern, and all day their voices were heard, seeming to get more and more shrill as they went on; but, I thought, knowing then little or nothing of the ferocity of these animals, they would arrange a truce sooner or later. In the morning all was quiet. Was it peace? Yes, of a kind! I poked in the heap of dry leaves which represented the nest made by shrew number one, and out it ran looking sleek and well; but of number two I at first could find no trace. At last in a corner of the cage I discovered a tail and bit of velvet fur. Number one had not only fought with the stranger, but had killed and eaten his foe.

Shrew combats often end in this way, cannibalism being nothing extraordinary in shrew life, which remark applies to both the common, pygmy, and water shrews.

The water shrew, as it name denotes, is a lover of the water. It is found in ditches and living under river banks, whence it can make aquatic excursions and seek the grubs to be found in the water-weeds and on the river bed. It is said to have a

partiality for fish ova and even for the young fry, and I do not doubt that this is correct, for a case of one doing damage in a salmon hatchery came under my notice. The tiny samlets, just hatched from the ova, were in a series of troughs through which ran a stream of water, but one trough, instead of being full of little fish, was empty, only a few bits being left to suggest the culprit. A mouse trap baited with cheese soon had a capture, and this was a particularly fine specimen, very black above and white below, of the water shrew.

In this species, with its aquatic habits, which swims and dives so well, the tail is long and strong and furnished with a keel of hairs that make an efficient rudder. In general manner of life it is like the other shrews, having a litter of from four to seven young in the summer, which are born blind, naked and helpless and are lodged in a snug nest. The nursery of the common shrew is usually tucked away in the herbage or beneath piled-up rubbish, and is well made of dry grass and leaves. The young develop very rapidly, their pink nakedness turning to a dull lead colour as their coats grow, and they are soon clad in jackets of short brown velvet which are lighter in hue than those of the adults. Throughout the autumn and on into early winter, the young shrews are easily distinguishable from their elders, but they become darker in the new year.

The pygmy shrew differs little from the common one in the details of its family life, its story being similar in most respects. This shrew, so minute and so dainty, is often confused with immature examples of the common shrew, but *S. minutus* can always be distinguished from *S. araneus* by the respective lengths of the tail and the head and body. In the pygmy shrew the tail exceeds the length of the head and body, but it does not do so in the case of the common shrew.

Although the pygmy is a widespread species, its presence in a neighbourhood is not always suspected; but there is a sure method of ascertaining whether it occurs or not, namely, to visit the roosting-place of an owl, collect a number of its pellets and dissolve them in water. Owls usually swallow shrews whole, and the skulls, little damaged, are thrown out in their castings, to afford indisputable evidence of the species to be met with in a district.

But if the pygmy shrew is an elusive wee beast, the larger, and it might be thought more conspicuous, water shrew is a yet more elusive animal. It runs like a shadow through the

rank vegetation at the waterside, glides in and out of the stream, and escapes observation in a magical manner, so that a colony of water shrews may be living near at hand and their presence remain unsuspected.

The different shrews, like the mole, seem to live in family clans, the members of which are tolerant to one another, though resentful of visits from strangers. Our ditches, hedge-banks, meadow herbage and woodland undergrowth are riddled with mouse runs, to some extent the common property of all the voles, mice and shrews of the countryside. In these tunnels there is much traffic, for this world beneath our feet is a busy one. But each clan of shrews exercises territorial rights over some corner of it, as we may learn by listening to their shrill voices in high-pitched challenge as they race to and fro.

THE WATER SHREW-MOUSE

CHAPTER VI

Bats

To many persons bats are just queer things that flicker through the twilight and nothing more, but to the naturalist they are a group of mammals of peculiar interest. Our British members of the order *Chiroptera* include some remarkable examples. What creature could be more strange than that gnome of the dusk, the long-eared bat? Then there are those weird little beasts, the greater and lesser horseshoe bats, with the horseshoe-like appendages on their noses.

There are fourteen species of bats upon the list of British mammals, but many of these are uncommon, and two are rare visitors from abroad, hardly eligible for inclusion as natives of these islands.

One of the most widespread of our bats is that tiny creature known to science as *Pipistrellus pipistrellus*, and to the countryman as the "flittermouse," which appears at twilight fluttering about the houses, gardens, bushes, and up and down country lanes. The pipistrelle is the common bat of England and Wales, of Ireland and of many parts of Scotland, and it is the centre around which legend and story have been woven, from awesome yarns of witches and black magic to equally unfounded stories of its liking for entangling itself in feminine tresses. As young women no longer indulge in long hair, this last legend should have died a natural death, but still the story persists, and an aura of mystery and superstition continues to cling about what is really an absolutely harmless and, in its way, beautiful little beast.

Close examination of a pipistrelle reveals it as clad, so far as the body is concerned, in soft and silky grey-brown fur from which a dark face, queerly like that of a miniature bulldog, looks briskly about. The eyes, though small, are bright and alert—how did the saying "blind as a bat" arise?—and the ears too denote brisk attention, even if it be defiance of the captor. Fear and anger move the bat to work its jaws and show a wonderful array of minute teeth, too small to hurt

45 NOCTULE BATS

The noctule or great bat is one of the largest bats found in Britain. It comes out at dusk to chase moths and other night-flying insects, and as shown here may often be seen flying high against the sunset-dyed sky

[*From a painting by the late E. A. Wilson*

anything bigger than gnats and night-flying insects, which the little animal captures as it flies through the darkness.

Our bats are all entirely insectivorous. They differ in their tastes and the size of their quarry, but their game is all embraced by the class *Insecta*. The pipistrelle, the smallest of our bats, is content with small captures. Flies and gnats that dance in aerie columns on the still air of evening afford it good hunting.

Most of our bats are vespertinal in their habits, that is, they come out at dusk, hunt for a while in the gathering gloom, then return to their dens for a rest and emerge again for a dawn flight. The pipistrelle, however, will often hunt all the night through, and may be seen overhead against a midnight moon.

When observing pipistrelles upon the wing, the watcher is often startled to see a bat tumble a little way through the air, then right itself and fly on. This occurs when a capture is made and the pipistrelle bags its prey.

In bats, the skin of the wings continues to the hind legs and from them to the tail, so that when the tail is curved forward under the body a bag is formed, known as the interfemoral pouch. When a bat chases and captures a flying insect and this proves a difficult mouthful, it drops its head and, with the help of its tail pouch, gets a better grip. This is the moment when, to the watcher below, the bat appears to have lost control and to be tumbling headlong.

This pouching business is such an ingrained habit that a pipistrelle will try to do the trick under impossible circumstances, as in the case of the bat I kept for a few days and fed on blue-bottle flies.

The queer little animal had been rash enough to fly indoors. A maid, braver than her fellows, caught it and brought it to me. I decided to keep it for a while and put it in a cage, where it hitched itself up by its heels in a dark corner; but as dusk approached it became very lively, scuttling about its quarters in a somewhat mouse-like manner which recalled the old countryside belief that the bat is half mouse, half bird. The bats, of course, have nothing to do with the class *Aves* or the order *Rodentia*, being a highly specialised order of flying mammals, mostly devoted to the pursuit of insects.

My pipistrelle was at first much upset and afraid. Its shrill and exceedingly high-pitched voice was raised in protest

when I offered it a fly, but as it menaced me with open mouth I pushed the fly within. That altered matters. The little animal was intelligent. It quickly learnt that I provided flies, and, instead of grimacing in fear when I approached, it grabbed them from me. But it found them difficult to deal with, and, when it tried to use its interfemoral pouch in orthodox manner, it tumbled over on its back, for the creature was used to eating while in flight and not on the ground. However, it disposed of a number of flies, so many that the windows failed to yield any more and I let it go, because flies had reached famine point.

With regard to the squeak of the bat, this is so high-pitched a sound that it is said that few persons over forty years of age can hear it. Certainly the cries that come down from the evening air are incredibly thin and shrill, much more so than the high-pitched calls of shrews at work in the undergrowth.

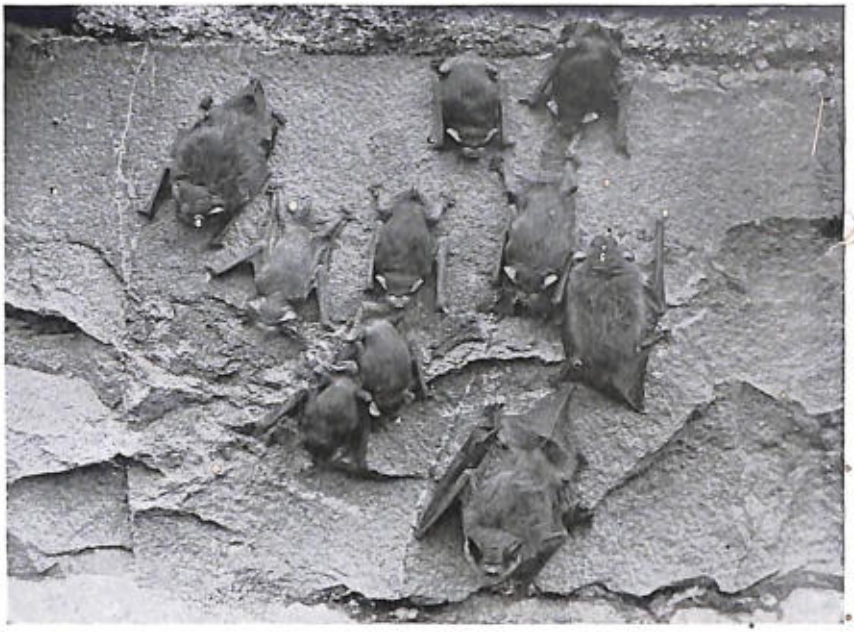
After the pipistrelle, the long-eared bat, *Plecotus auritus*, is one of the best known bats of the English countryside. It is also the species most easily recognised. A pipistrelle may be confused with a whiskered bat, but nobody can mistake the long-eared bat, with its immense ears extending before it like great sensitive feelers. They are nearly as long as its head and body, yet when the bat is at rest they are not conspicuous, for it furls them up out of sight, though the inner ear, or tragus, remains visible and looks like a narrow tapering ear on either side of the head. As the bat awakes, it brings its real ears into play, unfurling and extending them, waving them about, and again retracting them. They are exquisitely delicate; the skin is so thin and transparent that the veins may be clearly seen, and they have the appearance of antennæ rather than organs of hearing. The manner in which the owner quivers them to and fro adds to this effect. What is really the purpose of such an amazing development of the auditory organs?

Before we can attempt any answer to this question we must consider the long-eared bat's manner of life and mode of hunting.

It is essentially a bat of the bushes and trees, hunting in and out and round about shrubs, thickets and under boughs where moths abound. It seeks bigger game than the pipistrelle, catching quite large insects such as orange-underwing moths, swallowtail moths and so on. Such quarry is too large to be dealt with while on the wing, so the bat carries it home to its

46 THE GREATER] HORSESHOE BAT

This species, one of the largest of the British bats, lives mostly in caves, and prefers those of the limestone variety. It is particularly abundant in the Cheddar Caves in Somerset, where it may be seen hanging in clusters numbering many dozens



47 A group of pipistrelles. This species is the tiny "flittermouse" that flies around the houses at dusk

48 A noctule or great bat about to take flight. This is our most plentiful large bat

TWO COMMON BATS

49 Daubenton's, or the water bat, which is fond of hunting over the water

50 The barbastelle, a bat of strange features and quaint aspect

TWO UNCOMMON BATS

51 THE LONG-EARED BAT

This portrait shows one of the most extraordinary mammals found in Britain, its ears being as long as its body; yet it is a common bat of the countryside, and is frequently to be seen fluttering about the garden in the twilight

den, and there sups at its leisure. The long-eared bat is more expert at eating sitting down—or hanging up—than the pipistrelle. A certain long-eared bat was under my observation for two successive seasons. It lived beneath the rafters of a small outbuilding, and each morning a litter of wings upon the floor told of the meals enjoyed during the night. I always swept these away and left a clear space for the next lot of wings. I thus learnt a good deal about the food of this species of bat, but details of the nightly menu are not our concern now, the problem before us being the function of the great ears.

Watch a long-eared bat upon the wing, wheeling, turning, twisting, threading its way in and out of intricate obstacles, and doing so without hesitation even in the minimum of light. Its precision is uncanny. Its eyes are small and show no signs of being especially efficient. Whereas the eyes of many nocturnal mammals are remarkably developed, being large and obviously adapted to make the most of poor illumination, the reverse is the case here; in short it does not look as if a bat's eyes are much help to it in its manœuvres and its chases. Many naturalists are convinced that this is because the animal depends more on its ears than its eyes, not for hearing, but as feelers. These antennæ feel air currents, even such slight ones as air deflected from objects ahead, and the draught caused by the beat of a moth's wings. The theory holds that this is the secret of the long-eared bat's remarkable power of steering correctly under the most gloomy conditions.

Objectors point out that bats without any peculiar development of the ears fly through the darkness with equal precision, but it is probable that they have feeling apparatus of other descriptions, such as the leaf-like appendage on the nose of the horseshoe bats.

But of these latter species more presently. We must return for the moment to the long-eared bat and its life story, which usually begins in late May or June, when a single, tiny, naked, pink young one is born and is nursed by the mother with the utmost devotion. She carries it under her wing, clinging to her fur and taking its meals from her breast, until it becomes furred and grows so heavy she can no longer bear it with her. Then the little thing is left at home, probably with the other young ones of the colony, while its mother goes forth for her evening flight. In Great Britain it is rare for any species of

bat to have more than one youngster at a time, but on the Continent twins occur now and again.

One June day I explored a space beneath the tiles of an old house. The owner helped me aloft through a trap-door in the roof into a hot, fusty, dusty place beneath the rafters. Scuffling sounds, and the squeaking of small voices, came from the gloom. The ray of an electric torch revealed a bundle of small dark things clinging to a beam overhead, and I realised that I was looking at a colony of long-eared bats, which in a few moments, disturbed by the light, were fluttering around. There were females carrying young and bigger young ones that had reached independence, the gathering probably numbering from twenty to thirty all told.

The long-eared bat is not so social a species as some bats. Single individuals are often found, particularly in the autumn as hibernation approaches, and large colonies are exceptional, unlike the noctule, or great bat, which sometimes congregates in considerable numbers.

Nyctalus noctula, to use the scientific name of this latter animal, is another widespread species in the southern parts of the British Isles, and is the large bat that may be seen at sunset flying high across the evening sky, competing with the swallows and swifts in its mastery of the upper air. Compared with the bats we have been considering it is a big animal, about five inches in length from nose to tail-tip, and with a proportionate wing-span. Seen at close quarters, it has an almost ferocious appearance, especially when it raises its queer little snub-nosed face and grimaces at the person inspecting it. However, it is educable and intelligent, as was proved by Michael Blackmore when he bred one in confinement, and, the dam having come to an untimely end, brought it up by hand to become extraordinary tame and literally a pocket pet. Although "Bramwell" obviously knew his master and did not approve of strangers, the difference in the demeanour of this domesticated bat when compared with a wild-caught one was marked, and showed how little understanding of bat mentality and psychology is to be derived from frightened captives. Bramwell, tidying his silky brown fur with a minute pink tongue, was a very different being from some miserable bat dragged forcibly from its home.

In popular opinion bats are dirty creatures. It is true they have a certain number of parasites, but most fur-clad animals

have their fleas, and in this respect the bats are neither worse nor better than the majority of mammals. As regards care of their persons, they are most particular, and dress their jackets with great diligence, licking themselves with cat-like precision, particularly during their hours of leisure, which, generally speaking, correspond with those of daylight.

Normally bats are creatures of the night, but sunshine does not incommode them, and I have seen the pipistrelle and long-eared bat abroad at midday.

Bats at rest, whether in the light sleep of summer or the deep torpor of winter, hang head downwards, hitched up by their heels. The noctule, or great bat, which, as hinted, is often of sociable inclinations, may be found hanging thus in large numbers, particularly in old buildings, church towers, and such convenient lodgings. In the summer it will often make use of holes in trees. One day when walking beneath a tall tree, I heard a continuous shrill squeaking. It was a curious and somewhat uncanny sound, and suggestive of angry elves in furious dispute. The noise obviously came from a hole, once a woodpecker's nest, some ten feet overhead. A ladder was requisitioned and an investigation was made, when five bats, all noctules, three females and two males, were discovered, though the cause of the excitement remained a mystery—perhaps the odd female was disputing with the others for the favour of a male.

Little is known of the relations between the sexes, and there is a wide field of research here for the student of animal life. Naturalists are of the opinion that most of our bats mate in the autumn, but they soon lapse into the profound torpor of hibernation, and gestation only proceeds when the female wakes up in the spring.

The noctule is a heavy sleeper. We see little of it from the later part of October until the end of March, when it emerges from retirement to dash around in hungry chase of such insects as are now to be obtained. The pipistrelle, on the contrary, is easily disturbed. A rise in the daytime temperature arouses it forth at once, and a mild evening even in December is sure to see the "flittermice" wheeling and turning in the twilight.

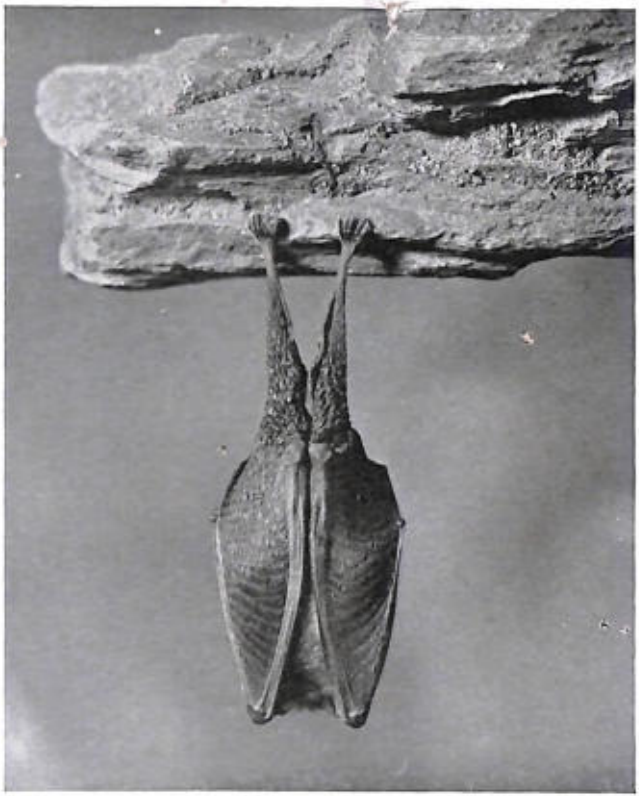
I believe the whiskered bat often joins the pipistrelle in these untimely excursions, but it is difficult to tell one from the other when they are upon the wing, for they are of similar size and have a similar style of flight.

The whiskered bat *Myotis mystacinus* is another fairly frequent and well-distributed member of the *Vespertilionidæ*, but it is not always recognised, being confused with the common "flittermouse," though on close examination the differences are apparent. The whiskered bat has longer, greyer fur, and sharper features, and it has possibly a greater craving for company. Pipistrelles are often found singly and not as a rule in any great numbers, but I have found as many as forty whiskered bats hanging from the roof of a disused cellar.

From cellars to caves is but a short step, so those cave-haunting species, the horseshoe bats, should perhaps be mentioned next, but I will defer writing of them until the rest of the *Vespertilionidæ* have been dealt with.

Our British bats are placed in two families, the *Vespertilionidæ* taking twelve species, and the remaining two going to the *Rhinolophidæ*. We have still eight bats of the first group awaiting description. The most notable of these are *Myotis nattereri*, Natterer's bat; *M. bechsteinii*, Bechstein's bat; *M. daubentonii*, Daubenton's bat; *Eptesicus serotinus*, the serotine; and *Barbastella barbastellus*, the barbastelle. There is also Leisler's bat, *Nyctalus leisleri*, a relation of the noctule, and *Vespertilio murinus*, the parti-coloured bat, upon our list of British Mammals. The last is so rare here that is is doubtful if we are really entitled to claim it as a native. The parti-coloured bat probably only comes here as a wanderer from the Continent. Bechstein's bat, too, is rare in England, yet has a more certain status than the mouse-eared bat, *Myotis myotis*, which, although it figures on our list, is no more than a vagrant visitor. But the barbastelle, likewise Daubenton's bat, are truly members of our fauna. The latter is sometimes known as the water bat on account of its habit of flying low over rivers and lakes, skimming the surface no doubt in order to capture flies and gnats hovering over the water, and sometimes actually dipping in, thus making circles upon the surface as it wheels and turns.

I once watched a considerable party of bats, which I believed to be of this species, hunting in the summer twilight over a quiet lake. The swallows and swifts had been busy, but as sunset hues flamed up the sky and the shadows of the trees upon the banks stretched out across the glassy water, their ranks thinned, though their places were quickly taken and the crowd remained as numerous and busy as before. But it was now one of bats, not of birds.



52 At rest, the bat enfolds its body with its large membraneous wings, and thus keeps itself warm

53 Awake, this cave-hunting bat is a very different creature, of alert, nervous disposition

THE LESSER HORSE-SHOE BAT

54 A London park squirrel expecting a gift

55 Having got a nut, it hangs by its hind toes to eat it

Elusive shapes, that appeared and disappeared, now in clear sight against the sunset sky, and the next moment lost in the shadows, greeted my eyes whenever I looked across the lake. The bats did not fly high, but skimmed to and fro over the water, into which they dipped at frequent intervals, so that its surface was rippled by circles that spread and spread.

Bats are thirsty little animals and drink like the swallow tribe, namely, by swooping down, dipping in and taking a sip as they fly.

The barbastelle, *Barbastella barbastellus*, is a small bat with dark fur, a broad head and bulldog face, chiefly found in our south-eastern and east-midland counties, and with a liking for caves.

Mention of caves brings us to the two species with particular fondness for such retreats, namely, the greater and lesser horseshoe bats. These bear the burdensome scientific names of *Rhinolophus ferrumequinum insulanus* and *R. hipposideros minutus*.

All bats are queer, elfish creatures, but few species exceed these two in quaintness, their strange nose adornments giving them a most peculiar appearance. As indicated by their names, the nose-leaf in both species takes a horseshoe form, so that these bats seem to bear a miniature horseshoe on the face. This remarkable feature makes recognition easy. We have no other bat at all like either of them, and the two are easily differentiated by their size, the greater horseshoe bat being as big as the noctule, though not so fine a flyer. Instead of racing on high it flaps low over the ground.

Both our horseshoe bats are essentially cave-haunting species, and their distribution is governed to a considerable extent by the location of suitable caverns. This must not be taken to mean that they are never found elsewhere, for the contrary is the case, but castle vaults and church towers take a secondary place in their estimation as desirable residences when compared with the greater caves of the limestone districts. The Cheddar caves, for instance, are a time-honoured haunt, as was formerly Kent's Hole near Torquay, "of which it has probably been an inhabitant ever since the age of the mammoth, since its fossilised remains have been found there in association with those of the latter and other extinct animals," says Professor Lydekker of the greater horseshoe bat in his *British Mammals* (page 19). But electric illuminations for the benefit of visitors have since frightened it away.

Here, in the quiet warm depths of these far-reaching caverns, the bats have excellent quarters. The temperature is remarkably equable, cool in summer and warm in winter. The humidity of the air is also fairly constant. In fact, the bats find conditions vary comparatively little, as they hang suspended by their heels from the roof and walls, sometimes single and sometimes in considerable parties.

Like all bats, an upside-down position is for them the ideal one, and that whether they are taking the light nap of a summer day or are lost in the deep slumber of hibernation, though it seems that the winter sleep is not so deep for these cave-dwelling species as it is for some of those that live in less sheltered places. Caves afford good sanctuaries for gnats and other small insects that pass the winter in the winged state, and the bats can get "light refreshments" without leaving home.

Natterer's, or the reddish-grey bat, *Myotis nattereri*, is sometimes found in caves, particularly in winter. This, as its name denotes, is a pretty light-coloured bat, it being particularly pale underneath, which is noticeable both when the bat is on the wing and when it is in the hand. It is said to be uncommon, but as it has been reported from many of the counties of England, from Ireland and from Scotland, it is evidently widely distributed and is probably more plentiful than is supposed.

To many persons a bat is just a bat and nothing more, and there is much work open to the keen field-naturalist on the occurrence and distribution of our bats. For example, Bechstein's bat, *Myotis bechsteinii*, may be described as our rarest bat, though it is numerous in many places on the Continent, being found in large colonies; yet few specimens of it have been found in the British Isles, however, it is possible it may occur more numerously than is supposed. It has rather long and big ears, though not such exaggerated ears as those of the long-eared bat, and a longish pointed muzzle.

In comparing and identifying British bats the following points should be remembered. The long-eared bat is the species with enormous ears. Bechstein's bat has larger ears, but they are of moderate length. The barbastelle, with its quaint forbidding face, has ears that meet at the base of its forehead. The noctule is a large bat with silky brown fur, widely-separated short ears and a bulldog face. The pipistrelle is a miniature edition of the last named, but confusion with it is

unlikely, the difference in size being so considerable. The whiskered bat, however, is about the same size as this pipistrelle, but it has more pointed ears, sharper features and its coat is more hairy in texture. Then there is the serotine, which is somewhat like the noctule, though its ears are larger and pointed and its fur is darker.

To interrupt these remarks on the identification of our bats, I must say that *Eptesicus serotinus* is another of the bats about which we could do with more information. We know it chiefly from southern England, from Kent and East Anglia and from Devonshire and Cornwall. It and Leisler's bat, *Nyctalus leisleri*, are undoubtedly frequently confused with the great bat. They are all three much alike when on the wing and similar in their habits, taking a brief excursion at sunset, when they race on strong wings through the dusk after the moths and other insects of the twilight, then retiring to their dens to spend the midnight hours therein, emerging again at dawn for another hour's flight, which ends when the rising sun sends them back to their homes.

Continuing with the differences by which our various species may be known, it should be remembered that the serotine is darker, has broader wings and more pointed ears than the noctule; and Leisler's bat is smaller and darker in colour than the great bat. But it must be confessed that identification of the uncommon species of bats is not an easy matter for the tyro. The inexperienced student of bats will turn with relief to such unmistakable kinds as the horseshoe bats, in which the noseleaf makes identity certain and size distinguishes the greater from the lesser. But whatever the species, a bat is a most interesting animal, and all our bats will repay, with a host of quaint details, study of their ways and habits.

THE SHORT-EARED BAT

A Table of British Bats with some points of Distinction

Rhinolophus ferrum-equinum insulanus (Greater Horseshoe Bat)
A large bat, about the size of the Noctule, horseshoe-shaped appendage on nose. Favourite haunt, limestone caves. Average 11 males, head and body, 63·2 mm. Average 5 females 65·8 mm.

Rhinolophus hipposideros minutus (Lesser Horseshoe Bat)
Resembles above, but little more than half its size, average length, head and body 38 mm. Also a cave species.

Myotis mystacinus (Whiskered Bat)
A small bat (average 6 males head and body 46 mm.) resembling Pipistrelle in size, flight and habits, but with greyer fur and sharper features. Has a hairy face.

Myotis nattereri (Natterer's or the Reddish-grey Bat)
Found chiefly in the midlands and south-east England. Very gregarious. Underparts nearly white. Fringe of hair on posterior edge of tail membrane. Average size, head and body, of 15 females 45·1 mm.

Myotis bechsteinii (Bechstein's Bat)
Very rare in Britain. Ears considerably longer than head.

Myotis daubentonii (Daubenton's or the Water Bat)
Often seen over water. Ears pointed. Inner earlet or tragus also long and pointed. Underparts smokey. Average size, head and body 45·5 mm.

Myotis myotis (Mouse-eared Bat)
A very doubtful native. As large as the Noctule. Like Bechstein's Bat, but ears when laid forward only reaching just beyond muzzle.

Pipistrellus pipistrellus (Pipistrelle or Flittermouse)
The common small bat. It has short ears, a bulldog face and silky brownish fur. Average size head and body of 35 females, 43 mm.

Eptesicus serotinus (Serotine Bat)
A large bat, somewhat like the Noctule but paler below. Outer margin of ear straight or slightly concave, not semi-circular as in the Noctule. It also has greater length of tail beyond the inter-femoral membrane. Average head and body length of 11 males and females 74·2 mm.

Vespertillio murinus (Parti-coloured Bat)
An accidental visitor. Upperparts dark brown, base of hairs yellow-white, underparts whitish.

Nyctalus noctula (Noctule or Great Bat)
Among British Bats only the greater Horseshoe approaches this in size. Average head and body length of 7 males 77·5 mm.

Nyctalus leisleri's (Leisler's or Hairy-armed Bat)
Resembles the Noctule but smaller. Its name is derived from a band of short hairs on the forearm, also found in the Noctule. Its reputed rarity may be partly due to confusion with the bigger species. Average size 59·5 mm.

Plecotus auritus (Long-eared Bat)
Common. Its enormous ears make it easily recognisable.

Barbastella barbastellus (Barbastelle)
Rare. Recorded chiefly from midland and southern England. The short ears meet in the middle of the forehead. Average size 48 mm.*

* The measurements are from G. E. H. Barrett-Hamilton's "History of British Mammals."

56 A SPRITE OF THE TREES

The red squirrel is perhaps the most graceful and attractive of our woodland animals, and is particularly lovely when it sits aloft with its plume-like tail curved over its back, and looks down with inquisitive gaze at what passes below

57 The long ear-tufts are a delightful addition to the intelligent expression of this species

58 The red squirrel uses its fore-paws, with their long sensitive fingers, as most useful hands

CHAPTER VII

Squirrels and Dormice

HAVING dealt with the bats, we turn from the *Chiroptera* to certain members of the *Rodentia*, which latter order is well represented on the British list. Our native members of it include such diverse and interesting creatures as the squirrel, hare, rabbit, rat, meadow vole and mouse, but in this chapter we will limit ourselves to "squirrels and dormice."

Until quite recently we had but one squirrel and one dormouse in Great Britain. Now we have two of each, the grey squirrel from North America and the edible dormouse from the Continent of Europe having been introduced here; the squirrel during the latter part of the last century, and *Glis glis* in this century.

Sciurus carolinensis, the grey squirrel, is now widespread in many parts of England and Wales, and the alien edible dormouse is firmly entrenched in Buckinghamshire, but we will leave the consideration of these foreigners in our midst for a while, and take our lovely native red squirrel and our dainty native dormouse for first description.

There are few animals more beautiful and graceful than that sprite of the treetops, the red squirrel, especially when it speeds along its overhead ways, leaping from branch to branch, and passing through its leafy world with amazing assurance, agility and ease.

Sciurus vulgaris is found throughout the wooded areas of England, Scotland and Wales, also in Ireland, and on the Continent it is common in all forest areas from the Mediterranean to the limit of tree growth in the north. Whether it is indigenous to Ireland is doubtful. Major Barrett-Hamilton, in his *British Mammals*, gives evidence to show it was present in early times, was exterminated and re-introduced. The squirrel varies in different parts of its range. Our British squirrel is somewhat less red than the average Continental specimen, and its fur fades more, particularly on its tail, which, in early summer, often becomes so bleached as to look

quite yellow or even white; hence our race is sometimes called the light-tailed squirrel, and scientists give it sub-specific rank under the title of *S. vulgaris leucourus*.

Although we speak of our squirrel as the "red squirrel," and it does look very auburn when we see it amidst the summer greenery of the trees, it is not really so red as it appears at first glance, particularly when it is in winter coat. Then it has a considerable admixture of grey in its body fur, though its head, paws and legs are truly red, while its plume-like tail varies according to the season from deep rich brown of darkest chocolate hue to a drab colour.

The squirrel is a truly arboreal animal. It dwells in the trees and gets its living among their boughs; moreover it is highly specialised for climbing and life aloft. Its hand-like feet, with their long, slender toes, and sharp claws, are excellent for clinging to the bark of trees and for enabling their owner to grip slender twigs when it has to hurry from tree to tree. The activity of the squirrel and the leaps it takes are often amazing; it seems to fly through the air, to alight on the top of a branch, swing for a brief instant, and then race on, up the bough, through the treetop and so on to the next tree. But so long as it is not unduly alarmed the squirrel will abstain from strenuous exertion and be content to dodge around the trunk, peep from behind the tree, stamp its feet, jerk its tail and cry "vut! vut!" at the intruder.

A red squirrel when thus annoyed always appears a pettish and temperamental creature, but in sooth the squirrel is an animal of particularly charming disposition, as anyone who has had a pet squirrel will testify.

One of the dearest pets I have had was a red squirrel named Jenny, who was found as a tiny youngster lying on a woodland path, after a night of furious storm during which trees had been blown down on all sides. Presumably the nursery nest had been blown down too. Howsoever that may have been, a wee red thing, its head and body being about three inches long, was brought to me and I tried to feed it, but it is surprising how obstinate such small animals can be. To cut the story short, my mother and I at last got the waif to suck milk from a crust of bread—she would not take it in any other way—and then all was well. Jenny grew rapidly and became a lovely squirrel, also a pet of remarkable tameness and of the most affectionate disposition. She lived in my work-room, having a nest

on the top of a shelf, whence she came out to run about and play with me, wash her face as she sat on my shoulder, lick my hands after putting herself tidy, and hide nuts in my pockets and down the collar of my coat. Afterwards she went back to bed, tucking herself up in her snug quarters, though possibly her nest of hay and leaves was no better than, maybe not so good as, the excellent one woven by a squirrel in the wild.

The red squirrel's "drey"—to use the term by which the nest is usually known—is a fine structure. A foundation of twigs is laid in the fork of some convenient tree, after which much moss, grass, honeysuckle bark and leaves are collected, carried aloft and pushed into place, until firm solid walls are formed. A roof is added, and a waterproof, windproof home is in readiness for occupation.

This nest is not only the squirrel's headquarters, but where it spends the most of its time, especially during the long, dark hours of winter, when it may not go forth for more than a brief exercise scamper once in the twenty-four hours.

It is commonly stated that squirrels hibernate, also that they lay by stores of nuts for winter use, but the first statement is not correct, for the British red squirrel does not hibernate. The latter story is more accurate for a great many nuts are hidden away. The squirrel may be seen out and about any day of the winter, even during frosty times and when the snow is on the ground. It can be watched bounding across the whiteness of the snow-covered ground beneath the trees, scratching here, poking there, then racing on to return to the branches where it feels at home and safe—in all its winter doings, lively and alert, as it needs must be, for it has to find food, no light task during the season of shortage.

The red squirrel hides supplies in a somewhat casual and erratic manner. In the autumn, when hazel-nuts, acorns and sweet chestnuts are plentiful, it spends much time gathering them and stowing them away. One nut may be pushed into a crevice of the bark of a tree, but many more will be buried singly in the turf, beneath fallen leaves and under the moss. Only a small proportion of those hidden can be recovered by their owner. This urge to hide anything she could not eat impelled my Jenny to drop nuts down my coat collar, push them into my pockets and stow them in every sort of nook and corner. I often found them in my boots and shoes, but Jenny only recovered them by accident. She was an intelligent creature,

yet I am convinced the way in which she hid food was purely impulsive and not governed by forethought.

Although nuts of different kinds figure largely on the menu of the squirrel, other fare is sought, such as the seeds of pine, spruce and larch, grain and grass-seeds, shoots and fruits, and even the eggs of birds. Callow nestlings are said to be taken at times, but I have no evidence on the point. The most serious charge we can bring against the red squirrel is that of damaging young trees in coniferous plantations by biting off the main shoots. For this reason foresters frequently wage war upon it, but naturalists who love this beautiful sprite will forgive it such deeds for the sake of its loveliness. After all, it is never a tenth so mischievous as the imported grey squirrel.

Reverting to the winter habits of the red squirrel, though it does not hibernate, it lies up in its snug drey for many hours at a time, preferring warmth and comfort to running about in the cold. To combat cold conditions amid the boughs a squirrel dons gloves in winter, or, to put it more precisely, the soles of its feet and hand-like paws gain a hairy covering which is shed in the spring, when too it sheds its plumed ear-tips, its thick coat and the long hairs of its tail.

The young, which do not usually number more than three in a litter, are generally born in May. We are lacking in precise knowledge of the mating habits of this species, but seemingly monogamy is the rule, and each female has but one family per annum.

The female squirrel is a fond and devoted parent. If the need arises she will carry her babies, as a cat carries her kittens, from the old nest to a new one. I had once the great good fortune to watch the removal of a family. I saw the little mother bring a youngster down from her drey in the top of a tall spruce to the ground, race across thirty yards of turf, run up another spruce, enter a new nest, emerge without her burden, come back, fetch another, take it in the same way, and then return for a third. They were each carried in her mouth, being held by the loose skin of the neck, and they hung quietly, their little tails curled up and brushing their mother's face. The reason of the removal I never knew. It may have been that the drey was in a too public situation, or possibly it had got into a verminous state. Fleas are often numerous in squirrel's nests.

The red squirrel varies much as regards its numbers from

59 THE GREY SQUIRREL

Its silvery-grey fur, rat-like head, and the absence of ear-tufts, at once distinguish the grey squirrel, introduced here from North America, from our native red squirrel

60 Asleep, the dormouse is so deeply unconscious that it may be handled without awaking it

61 Awake, the dormouse is a particularly alert little creature, and able to move very swiftly

year to year. The researches of the Oxford School of Biology have shown that it, in company with many other rodents, and in particular the grey squirrel, tends to wax in numbers periodically. It has cycles of increase and decrease. During the periods of decrease it gets more and more scarce and almost vanishes from our tree-tops, disease, probably coccidiosis, being seemingly the responsible agent.

The grey squirrel is often blamed for the disappearance of the red, and certainly the red tends to vanish from localities where the grey reigns supreme; and there is some evidence that the grey actually attacks our smaller and more elegant native squirrel. But probably competition for food and good dwelling-places, in which competition American "go aheadness" is bound to tell, is the true factor in the matter.

The grey squirrel, as has been said, is subject to the same tendency to periodic reductions in number, but during its periods of prosperity it does indeed flourish, as its colonisation of large areas in the United Kingdom goes to prove.

Sciurus carolinensis was introduced into the British Isles at various times and in a number of places. Many persons thought it a charming animal which would make a nice addition to our fauna, forgetting that introductions are ever dangerous. Mr. A. D. Middleton* gives a list of eighteen places where American squirrels were turned out between 1889 and 1910, beginning with Bushey in Middlesex, the only spot where the squirrels failed to establish themselves, and including localities as far apart as Kent and Yorkshire. All the introductions save the first were successful. In the light of the later knowledge we have gained the only matter for wonder is that number one was a failure. The English countryside and climate proved most suitable for this species, which is particularly sturdy and virile. The early introductions increased and multiplied, grey squirrels appeared in places far distant from their starting-point, until now districts free from the invaders are more notable than those where grey squirrels occur.

As is so often the case when an animal is placed in a new environment, what had been thought a harmless little beast soon proved the reverse. A creature of catholic tastes, with the usual razor-edged, chisel-like teeth of the rodents, there is very little in the way of fruit, nuts, bulbs, seeds and grain that

* *Proceedings of the Zoological Society of London*, October 22nd, 1930.

it does not sample. In addition, it has a marked liking for the eggs and nestlings of such birds as build in and under the trees. It has even been known to take young rabbits from their hole! The description of it as the "cat of the trees" applies not only to its habits, but to its appearance. It is a larger, more solid, and less spritely animal than the red squirrel, without ear-tufts, and clad in silver grey. It certainly has attraction, but lacks the fairy grace of our native species, though it is in no way behind it as regards activity—for the grey squirrel is a great acrobat. Yet again I would not say it is so truly a creature of the trees as the red. A grey squirrel will venture far from the nearest tree, but the red likes to have a tree-trunk within reach, so that it may scamper back to safety when danger threatens.

They are animals of considerably different characters. I do not think the red squirrel has the stamina of the foreigner. My little pet squirrel got very tired. She would suddenly, having had a romp, lie down and rest perfectly limply for a while, and she spent the greater part of her time in her nest.

It is probably the greater energy of the grey squirrel which has enabled it to supplant the red where and when they meet. There is little evidence of actual war between the species, nor on the contrary of any fraternization. Alleged hybrids between the two are based on mistaken observations. The red squirrel in winter coat often looks so grey.

Possibly the decrease of red squirrels in some places is not in any way due to the grey, but is merely a coincidence, for, as already remarked, the red species is subject to epidemic disease and periodic reduction in number. It reached a low ebb in 1904–14, and again prior to 1930, but has since been on the up-grade, so that now red squirrel dreys may be seen quite plentifully in many woods, and the owners may also be seen peeping down from on high, staring with those large dark eyes that evidently enable the squirrel to view things both near and far.

Before leaving the squirrels for those lesser inhabitants of the trees and bushes, the dormice, it only remains to state that as regards dreys and storage of food the grey squirrel is of similar habits to the red. It, too, makes a large comfortable nest aloft, and it, too, puts away such food as it cannot eat on the instant in a casual and unmethodical manner, to be later refound or forgotten as luck may dictate. Many a great

oak and many a hazel-bush undoubtedly owe their existence to the busy squirrel that buried the acorns or nuts from which they arose.

The common dormouse, *Muscardinus avellanarius*, is, like the red squirrel, to be found in woods of oak and hazel, but whereas the squirrel is also found in pine forests, the dormouse does not flourish in such surroundings.

Some three inches in length as regards head and body, with a slightly bushy tail another two and a half inches in length, clad in yellow-buff fur, with large dark eyes, and wee hand-like paws, the dormouse is a particularly attractive small creature. It is as truly arboreal in its habits as the squirrels, but it is an animal of the bushes, not the trees, particularly of the hazel-bushes where honeysuckle twines about the branches and provides it with nest-making material.

During the summer months it lives aloft among the branches, dwelling in a neat round nest little bigger than a cricket ball, which nest is woven of grass, honeysuckle bark and leaves. It has no exit or entrance hole, at least not when the owner is at home, for the mouse merely pushes its way through the elastic walls and closes the hole behind it. Likewise, when the dormouse wishes to depart it leaves by poking its head out at any convenient point.

Once when walking along a woodland path I saw a dormouse's nest in a wayside bush and paused to investigate it. It was a trifle bigger than usual, which made me suspect it to be a breeding nest. I touched a spray of honeysuckle, a rope which wound round the branch which supported the nest, and in an instant a dormouse face was thrust through its side. A yellow-buff furry head, with large lustrous dark eyes looked in my direction. Again I touched the branch. Out ran the mouse and after it came a second, a third and a fourth dormouse. The party consisted of a mother and three young ones almost full-grown, but the latter were rather duller in coat-colour than their parent. This was on August 28th. On August 30th the family were still at home, after which I did not visit them until October 30th, when I found they had gone, their quarters being usurped by a long-tailed mouse.

The long-tailed or wood-mouse, *Apodemus sylvaticus*, is no use at weaving aerial hammocks, yet it keenly appreciates a home aloft and I have often found it in dormouse nests. Whether it merely takes possession after the owners have

retired into winter quarters below, or whether it evicts them, I am uncertain, but it is a keen, sharp-witted little beast and I would not trust it. Judging by the pinch I received when I pushed my finger into a dormouse nest one day to encounter a long-tailed mouse, I think a dormouse would have little chance against it.

I was looking for dormice, saw a nest in a briar bush, poked and felt what I thought was a sharp thorn, drew back my finger and out leapt a beautiful long-tailed mouse. It fell to the ground and scuttled off across the mossy floor, and I was left to wrap my handkerchief round a bleeding finger.

The dormouse rarely bites, even under provocation, which formerly made it very popular as a pet. I say "formerly" because it is no longer easy to get dormice. These once common animals have become scarce, and in many parts of the country, where twenty to thirty years ago they were numerous, they are now unknown. The reason for the decrease is inexplicable. A similar diminution of the harvest mouse has been blamed on modern agricultural machinery. We cannot assign any such cause in the case of a woodland mammal which during the summer months lives aloft in the bushes.

The natural foes of the dormouse are the same as those of the other small animals, namely, hawks by day and foxes and owls by night; but its habits render it less liable to attack than the ground-dwelling mice. Disease may possibly have played a part in its shrinkage, but I have a theory that its reduction is due to climatic causes and changes.

Before going into this we must consider the winter behaviour of the dormouse. As its name of "dor-mouse" indicates, it hibernates during the cold season. So soon as the nights get chilly in the autumn this mouse tends to become lethargic. It has made good use of the season of plenty and is now as round and as fat as it can be: indeed it is a picture of stoutness and prosperity, with its winter provisions stored on its person. It only needs the sinking temperature of oncoming autumn to make it fall asleep. I have found dormice in October, still in their summer nests aloft in the bushes, so torpid, so cold and inanimate that they seemed dead, and I was able to remove them from their nests and return them without arousing or in any way disturbing them. The warmth of the afternoon brought them to life again, and by evening they

were as alert as ever, but with the tendency to torpor comes the desire for a safe hiding place.

In autumn the dormouse leaves its summer lodgings, makes its way to the ground and seeks well-hidden quarters. I have found dormice under logs, old tree stumps, and once saw one brought up from a depth of three feet underground. I was watching some men ferreting for rabbits, and they had had to dig open a deep rabbit-hole when one of them threw out with a spadeful of earth a neat ball of grass. This ball rolled to my feet, I picked it up and heard a slight wheezing sound. Inside was a sleeping dormouse, and the wheezing was its faint breathing. A hibernating dormouse seems hardly alive. Its body temperature falls so low that it is cold to the touch. Of course, as in the case of an engine which is throttled down, life is now maintained with a minimum consumption of fuel—that is, of the animal's internal reserves.

A rise in temperature will, however, quickly bring a dormouse back to wakefulness and activity, hence during a mild winter, such a season as has been so frequent in the British Isles during the past twenty-five years, the mouse has very broken slumbers.

It was formerly believed that the dormouse put away stores for winter emergencies. So far as I can discover, its hoarding instinct is not so well developed as that of the squirrel, and I cannot find evidence that it does any real storing of nuts and acorns. Moreover, it is obvious that if it was in the habit of laying by provisions it would not need to hibernate. Lastly, it is of decidedly insectivorous tastes, and such food is particularly difficult to discover in winter.

It seems certain that any dormouse which takes exercise in mid-winter finds little reward for doing so, and its activity will cause it to make severe calls upon its internal reserves, with the consequence that it may find itself too reduced to survive until spring and spring-time supplies arrive. It is my opinion that it is the mild winters during recent years which have brought about the reduction in the numbers of the dormice.

Howsoever this may be, the fact remains that dormice have gone from the majority of their old haunts. Formerly they were found throughout the oak and hazel coppices of England and Wales, though they seldom, if ever, crossed the border into Scotland and were unknown in Ireland. Abroad, dormice are found over the greater part of Europe, though *Glis glis*,

the edible or fat dormouse, is the more common of the two on the Continent. Of this latter species it will be necessary to say something later, for it has recently been imported into England.

With regard to the food of the dormouse, although it is usually regarded as a nut-eater, and although it *does* grow fat on hazel nuts and acorns in autumn, it consumes a variety of other things, even the eggs of small birds! I once caught two dormice in the act of raiding a long-tailed tit's nest. The fluttering and twittering of small birds drew my attention to a blackthorn bush, and peering into it I spied not only a pair of agitated tits, but two dormice coming out of their nest. One had an egg which it sat up to eat.

Insects and grubs, particularly caterpillars, are eagerly sought and devoured with relish. A tame dormouse that escaped from its cage and got into a box in which I was rearing 150 larvæ of the privet hawk moth demolished the lot.

Seeds, fruit and so on also figure on the bill of fare. Dormice kept in confinement will eat apple, and I have known one sample a plum. The more room they can be given and the more variety of food they receive the better they will flourish. Water is a necessity, and should be provided at all times, for dormice are thirsty little creatures; yet do what one will, it is exceptional for dormice to breed in captivity. Even in the wild they do not breed very freely, only one litter numbering three or four youngsters being born in the course of the summer, usually about July. They are naked and pink at birth, and I have known a late-born family still blind and helpless in October. These babies, I fear, had small chance of survival.

It is no doubt its slow rate of increase which has been a factor in the diminution of this species. The Continental edible, or fat dormouse, appears to be a more prolific animal and one of more hardy, go-ahead disposition, at least, so its recent colonization of parts of Buckinghamshire would seem to indicate. Here imported specimens have settled down and made themselves at home. The species shows a rat-like ability to make its way in the world, not as a shy retiring animal of the woods, but as a thief of the garden and a lodger in the house.

Once again the undesirability of introducing alien creatures is strongly shown, for an animal that in its home countries

is a more or less inoffensive species seems here likely to become a nuisance. This dormouse is of less arboreal type and more rat-like in appearance than our native one, which it exceeds as regards size. Although dormice in general, and our native dormouse in particular, have a good many characteristics in common with the squirrels, such resemblances are due to adoption of similar environment rather than near relationship, for the dormice and squirrels belong to distant families. The red squirrel and the dormouse have been treated together in the present chapter, because, in Great Britain, they are found in those typical English woods where hazel-bushes grow beneath the great oaks, and because they are near together in their likes, dislikes and needs, if not so close in structural details.

THE SQUIRREL

CHAPTER VIII

Rats, Mice and Voles

"RATS and mice" are words which make most persons shudder, yet which denote a group of rodents of great interest and outstanding importance, though, in the majority of cases, the reverse of beneficial to the human race. The common rat is a dreaded enemy, the house mouse is an unmitigated nuisance, and the meadow vole is often a plague in the countryside; nevertheless these and their allies are animals which enthrall the student of mammals and fill him with respect, for they embrace species second only to man in ability to overrun not merely the British Isles, but the wide world.

We have two kinds of rat in Britain, the common, too common, rat, otherwise known as the brown or sewer rat, *Rattus norvegicus*, and the black, old English or ship rat, *Rattus rattus*. The appearance of the first is too well known to need description; the latter is a more slightly built, elegant, mouse-like creature, with large ears, large eyes and a very long tail. It is variable in colour, being sometimes fawn, sometimes slate-grey and not infrequently black, to which it owes its title of "black rat." Neither of these rats is indigenous to north-western Europe, both being seemingly of Asiatic origin, where they early found the advantage of association with humanity and adopted semi-parasitic habits which resulted in their wide distribution through the Old and New Worlds. The black or ship rat was the pioneer in Britain, getting a free passage to this country as a stowaway in shipping from the Mediterranean. The blame for bringing it here is usually bestowed upon the returning Crusaders, who are supposed to have involuntarily brought it home with them in their belongings. It certainly arrived during the Middle Ages.

Once this rat had obtained a foothold it was soon in every home, for, being a very nimble, active animal, it had no difficulty in penetrating the wooden houses which prevailed in the cities. Its ability in this direction was brought forcibly to my notice when some black rats which I had in cages—

62 The old English or black rat, of somewhat mouse-like appearance and with a very long tail

63 The common or brown rat, which has replaced the above species in most parts of Britain

RATS

64 THE BROWN RAT

The brown, common or sewer rat is an animal which, in the wake of mankind, has spread to almost every part of the world, and in Britain is found from north to south, flourishing at our expense in every town and about every homestead; even in the most remote country districts

obtained with much trouble for purposes of study—got out and went off. They escaped in an outbuilding, but in a day or two were indoors, and what trouble they gave before they were recaptured! From larder to attic nothing was safe from them, and they did great damage. Rats in Tudor and early Stuart times must have been a sore trouble, also a terrible danger as carriers of pestilence.

At that time bubonic plague was rife in the land, across which it swept at frequent intervals and with devastating effect. It is now known that rats are as prone to the disease as human beings, the infection being transferred from rat to rat, and from rat to man by fleas which leave the dying rodents. Both brown and black rats can act as carriers, but the brown rat is not so fond of living in houses as the black, and the latter is the greater danger. It was undoubtedly the principal agent of plague infection in England in times gone by, for when the brown rat arrived here in early Georgian days—it was therefore known to many as the Hanoverian rat—and largely ousted the black rat, plague ceased to be the terrible menace it was of old.

The supplanting of the black rat by the brown was helped by the alteration in housing, by the disappearance of wooden houses, their replacement by buildings of brick and stone, and the improvement of sanitation, including the removal of garbage from the streets.

To-day the black rat in Britain is practically confined to our ports, where it infests warehouses and gets aboard ships, its activity giving it a great advantage over the brown rat when it comes to a seafaring life. The latter, if it to some extent yields place to the black rat on board ship and in the ports, is an easy winner elsewhere, penetrating not only to every corner of our great cities, but to the most remote and lonely homesteads. It is indeed a ubiquitous animal. Every man's hand is against it and yet it flourishes, so that we hate and fear it the more. Its intelligence and cunning adaption of habits to meet needs making us respect it despite our dislike.

However, despite this being the feeling, and a well-deserved feeling too, against the common rat, many persons have made friends with individual rats and found them animals of high mentality and much personality. One of the most charming pets I have had was a common rat. Samuel Whiskers, as he was called, was obtained as a tiny youngster, so small as to be

unable to feed himself. The cat had kittens and I placed the baby rat among them. Puss adopted him and nursed him devotedly. Whiskers flourished and grew rapidly to become very tame and affectionate and a household pet. As an indication of his quick wits, I must mention that if anything startled him he did not run away but raced to me for protection, to take refuge under my coat and thence to peep out and see if there was any real cause for alarm.

Poor old Whiskers came, alas! to a bad end. He went out one day through an open window and was lost for a week. I then found him in an outbuilding, but he had been in the wars, having done battle with his wild relatives and suffered in the fight. He was terribly bitten, and, after lingering for some weeks, died from his wounds. He was but a large ordinary farmyard rat, but more than one eye was damp when we buried him.

It is noteworthy that the domesticated white rat so often kept by children, also much used in scientific experiments, is an albino form of the common rat. Some persons think it is derived from the black rat, but this is not the case. Moreover, the black and brown rats are not known to hybridise, supposed hybrids always turning out to be colour freaks of one species or the other.

Both these rats are extremely prolific beasts, having three and four litters of young per annum, each containing six or seven little ones and sometimes more. The rate of increase of the rat, and the possible offspring of a single pair in ten years, reach figures to make the brain reel, while calculations regarding the damage done by rats in England suggest so terrible an amount that it is relief to turn to the rat's small relative, the house mouse.

In every respect *Mus musculus* is a lesser rat. It, too, is not an indigenous species but one of Asiatic origin, introduced here within historic times, though, like its big cousin, it has since spread far and wide, even reaching remote islets such as St. Kilda out in the Atlantic off the west coast of Scotland, and there making itself at home. Isolation brings about differentiation, and the St. Kilda mouse became recognisably distinct from that of the mainland of Great Britain. *Mus muralis*, as it was dubbed, was slightly more robust than the common house mouse and had cranial peculiarities. I say "was" because it may now be extinct. Like other house

65 THE HOUSE MOUSE

The common house mouse is probably the best known small mammal in the land, at any rate to the housewife and her cat. Like its larger relative, the brown rat, its existence depends on mankind, who is at once its worst foe and its best friend, even though the friendship is an involuntary one

66 A WONDERFUL ACROBAT

The harvest mouse, though so tiny and of fragile appearance, is amazingly active and a marvellous climber. It is aided in its acrobatics by its prehensile tail. Note the good use that two out of the three mice in this photograph are making of their tails

mice, wherever found, its existence was dependent on mankind, and when this lonely islet was evacuated in 1930 the mice were left to a precarious existence. Some of the islanders have since returned as summer visitors, but the fate of the mice remains uncertain. However, no housewife will mourn if the mice have departed; her only sorrow will be that all the mice of every house in the country have not gone too, though she can thank the domestic cat that mice are not a still greater nuisance.

Much more attractive, and without the same aptitude for making themselves a pest, are the mice of the genus *Apodemus*, of which we have no less than a dozen species and sub-species on the British list, though for practical purposes there is only one of importance, namely, *A. sylvaticus sylvaticus*, the long-tailed field or wood mouse.

This is one of the most numerous small mammals of the countryside, being found wherever it can get food and sufficient shelter. It is a great source of food supply to the owl, kestrel, buzzard, weasel, fox and other creatures that like such fare. It is a slim smooth-coated mouse, with a long tail, large ears, big eyes and the most dainty of hand-like paws. To see one sit up and wash its face, rubbing ears and quivering whiskers with tiny cat-like gestures, is a treat indeed. Although the living-place of a long-tailed mouse has a distinctive odour, this species is without the objectionable musty smell of the house mouse. It is a truly wild mouse, living in the ditches, on the hedgebanks and in the woodland undergrowth, whence it climbs aloft to feast on wild fruits, berries, nuts, grass-seeds and such fare. Harvest time finds it visiting the corn-field to sample the grain, and when harvest is over the farm-yard, with its ricks, draws a certain number of individuals—though I have never known *Apodemus sylvaticus* come in to the house, which remark does not apply to the yellow-necked mouse, *A. flavicollis wintoni*.

This last is a bigger, finer and more beautiful edition of the common long-tailed mouse, which is most plentiful in the West of England. It is not only larger, but it is brighter in colour than *A. sylvaticus*. Its white underparts look particularly clean, and across its throat is a band of yellow-fawn, hence the name of "yellow-necked mouse."

It was first recognised as a distinct species when Mr. de Winton found it in Herefordshire in 1894; and we know now,

that it differs from the common long-tailed mouse not only as regards size, but in habits and disposition. It is a much bolder creature, and commonly comes into houses in the winter. I have caught many lovely "greyhound mice"—to use the country name for this species—in larders and cellars, also in outside sheds, to say nothing of among the rows of peas in the kitchen-garden. I have even known instances of yellow-necked mice invading beehives and robbing the bees. A hive, of which the bees seemed in a poor state, was opened and out jumped two "greyhounds"; they leapt to the ground and bounded off like miniature kangaroos, leaving a sad spectacle behind them. Most of the contents of the hive had been eaten, while the mice lodged snugly in a nest made of the cloth which had covered the top of the brood chamber.

All the mice of this group will vary their normal vegetarian fare with honey, the eggs of small birds and such things. Under some circumstances they are not above cannibalism, as when I placed a pair of common long-tailed mice in a roomy cage with a pair of yellow-necks. The bigger mice quickly slew the smaller ones, and showed a provident spirit of "waste not, want not" with regard to the disposal of the remains!

There is considerable antagonism between these two mice, much more so than between long-tailed mice and voles, which I have often induced to live together quite happily. I do not believe the yellow-necked mouse and the common long-tailed mouse ever interbreed.

Both these mice have two or three litters of young in the course of the summer, the little things being blind and naked at birth. Their mother nurses them well in a snug nest hidden under brushwood, down a hole, or in some other warm nook, and they soon wax big, strong and active. The rapid rate of increase of the long-tailed mice makes them liable to feature in "vole plagues", but of these more presently when we have finished with the distribution of long-tailed mice in Britain. *A. s. sylvaticus* is found throughout England, Wales, Scotland and Ireland, likewise on many of our islets. On Bute, in the Inner Hebrides, occurs a slightly different form known as *A. s. butei;* while in the Outer Hebrides we have a more distinct type known as *A. hebridensis*, subdivided into five island races. The St. Kilda long-tailed is also distinct,

67 A LATE FEAST

It was at 11 p.m. on an October evening that the photographer secured this "flashshot" of a long-tailed field mouse eating on a stick. This elegant species is more nocturnal than many of our small beasts, and commonly has midnight meals. It is also a great climber, and remnants of its repasts are often to be found in old bird-nests

68 A WATER VOLE

The water vole loves the damp riverside, where it can find food and shelter beneath the overhanging vegetation. Its waterproof fur makes it immune from wet and dirt, both of which are easily shaken off to leave it clean and tidy, so it is forever paddling in the mud or going for a swim in deeper water

69 "ATTENTION!"

The bank vole, or red mouse, lives in hedge-banks, the woodland undergrowth, and such places. The photographer caught this one in the act of emerging from its run, but pausing to listen, with raised paw, before coming forth on to the snow-covered ground. The picture was taken early in March

70 A DEVOTED MOTHER

This life-sized photograph shows a short-tailed meadow vole removing one of her young ones from its nest. The nest, placed amongst the grasses and made of shredded fibres, had been accidentally exposed, but the mother returned to her offspring, and without regarding the camera, carried them away, one by one, to a safer situation

being entitled *A. hirtensis*, while Fair Isle, Foula and the Shetlands have their own races, these being sub-specific forms of the species *A. fridariensis*. All these mice are, however, very similar to the common long-tailed mouse, so we will leave them and go on to the voles, those small, furry, brown mice of the meadows already alluded to in connection with vole plagues.

When you walk across the fields, particularly where the grass is long and rough, you will find mouse tunnels between the stems and discover signs of numerous small creatures. With luck a glimpse may be caught of one of the inhabitants, though it will be no more than a glimpse—just an impression of a small brown shape slipping away between the grass stems.

I have written of the long-tailed mouse as an exceedingly numerous animal, but its numbers are often equalled, and in some seasons much exceeded by those of the meadow vole. The rodent tendency to wax and wane periodically, is particularly noticeable among the voles and lemmings, which have a peak of increase on an average every fourth year. When mild dry breeding-seasons coincide with this periodic tendency to wax numerous, when natural foes are scarce and there is nothing to keep the mice in check, we find ourselves confronted with a vole plague.

Microtus agrestis singly is a charming little mammal, with quaint ways and confiding manners, but in bulk it is a menace to the countryside, as in the case of the vole plague around Lake Vyrnwy in North Wales in 1934.

This artificial lake supplies Liverpool with water, and to safeguard the supply the Liverpool Corporation has acquired much of the land around, which extensive hillsides have been largely planted with young trees. Plantations such as these, where grazing animals are excluded and tall grass, bracken and briars flourish unchecked, afford a wonderful sanctuary for mice and voles. They can multiply beneath the undergrowth without hindrance from owls and hawks, and so it was in 1934, when voles appeared in terrific numbers. When I visited the spot they had eaten one hillside bare. *M. agrestis* is a grass-eater; it eats out its highways before it, and only varies this diet with similar green stuff, or, if hard pressed, the bark of trees and bushes. Necessity had in this case compelled the voles to attack the newly-planted trees, for they had already devoured all the green grass, only dead stuff being left.

Sere and brown were the banks, their colour being grim testimony to the appetites of the insatiable rodents which were now faced with famine.

Six months later I revisited the place to find it green and prosperous, and without trace of even one vole. On my previous inspection I had seen mice running about in broad daylight; now they were conspicuously absent, nor could I find any hint anywhere of the presence of voles, which had entirely disappeared. The contrast was startling, indeed almost awe-inspiring.

It seemed that the abundance of voles had caused buzzards, kestrels, ravens and owls to appear in unusual numbers. Weasels, stoats and foxes also flourished; but it was disease that swept away the mice, and that with amazing completeness.

This, of course, was an unusually dramatic example of what is regularly taking place among our countryside population of voles and mice—namely, a steady rise in numbers, then disease and a temporary decline. Although *Microtus agrestis* is ever the most conspicuous culprit in a vole plague, the bank vole and long-tailed mouse usually help to swell the numbers.

The bank vole, sometimes called the red mouse, is that pretty chestnut-hued mouse which haunts hedgebanks, thickets and often the kitchen-garden; but before we deal with it we must finish with the mice of the *Microtus* group.

Our common meadow vole is divided by zoologists into five sub-species: *M. a. hirtus*, of England and the Lowlands of Scotland; *M. a. neglectus*, the Scottish short-tailed vole; *M. a. exsul*, of the Hebrides; *M. a. mial*, confined to Eigg; and *M. a. macgillivraii*, of Islay, these island races testifying to the effect of isolation in producing differences in teeth and cranial characteristics.

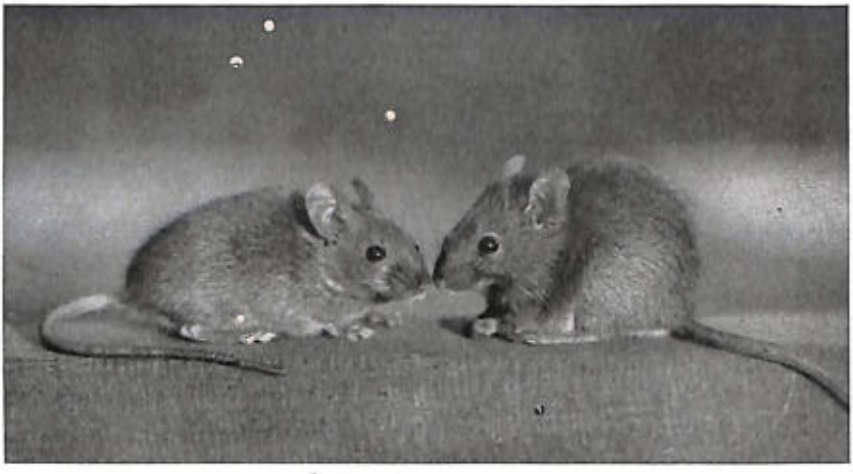
Again in the Orkneys we find evidence of the effect of island life in producing distinct races. To begin with, the Orkney vole is a quite different mouse from the common vole, and it is of bolder habits, driving its runs and tunnels far across the moors beneath the shelter of the heather and rushes. *Microtus orcadensis* also differs in temperament. I have handled many common voles and never known them attempt to nip, but the Orkney vole will use its yellow, rat-like teeth to good effect. One that I captured and brought south bit viciously whenever a finger was put near it. It "drew blood" from more than one hand. But I must add that another,

71 Young meadow voles are born in a nest of shredded grass hidden between the stems of the herbage

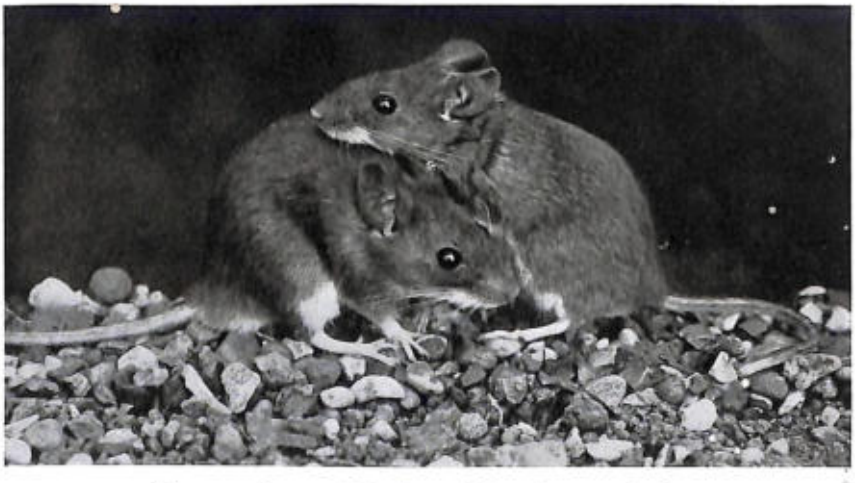
72 The short-tailed meadow vole is usually plentiful in the hayfields, and may be looked for in long grass

THE SHORT-TAILED MEADOW VOLE

73 The Skomer bank vole, found only on the Island of Skomer



74 A pair of common house mice



75 Two specimens of the beautiful yellow-necked mouse

known as Rognvald Petersen, lived for a long time, on happy terms and in a most amiable fashion, with a common vole distinguished by the homely name of Bill Smith. Despite the masculine names they were of opposite sexes, yet no progeny resulted from their association. Probably the two species differ too much to interbreed.

As I have said, the Orkney vole supplies evidence of the effects of island life in the evolution of species. *M. orcadensis* has split up into five distinguishable sub-species on as many islands, Mainland, South Ronaldshay, Rousay, Westray and Sanday, each having its peculiar race, known as *M. o. orcadensis*, *M. o. ronaldshaiensis*, *M. o. rousaiensis*, *M. o. westrae* and *M. o. sandayensis* respectively.

To turn now from the meadow or grass mice to the bank voles, we have the common widespread *Clethrionemys glareolus britannicus*, found throughout the mainland of Great Britain, *C. alstoni* and *C. erica* found on Mull and Raasay off the west coast of Scotland respectively; and *C. skomerensis* of the Welsh island of Skomer. The latter mouse is of especial interest, for it is unique, being found only on this small island of some 900 acres off Pembrokeshire, and differing considerably from the mainland bank mouse. Many of our peculiar island races of mice are obviously the result of isolation and differing environment. In some cases the distinctions consist of dental details and cranial measurements that to the layman hardly seem to merit a scientific name, but the Skomer bank vole comes into another category. It is believed to represent an older type of bank mouse than the pretty little fellow of our English hedgerows. Allied species are found in the Channel Islands, and the idea is that mice of this kind were once widespread in north-western Europe but were ousted by the nimble, quick-witted stock represented by *C. glareolus*. According to this view the Skomer mouse is a "living museum specimen" from a bygone epoch. To study it I visited the island, captured several examples alive and unharmed and brought them home for observation. They were charming mice, bigger, handsomer, of a more yellow-brown shade of chestnut than the common bank vole, and of a much more placid temperament. They allowed themselves to be picked up and stroked without resentment or attempt to escape, whereas any individual of the common bank vole would have struggled strenuously and made a flying leap for

liberty at the first opportunity. It was easy to understand how the latter quick-witted mouse could supplant the comparatively slow-going Skomer vole.

Allied to the bank and meadow voles, resembling them in habits but superior in size, are the water voles. I nearly used the singular and wrote "the water vole," because for practical purposes we have but one kind in Great Britain—again, this species does not pass across the Irish Sea—namely *Arvicola amphibius*, though the species-makers have divided it into two geographic races, giving the sub-specific title of *A. a. reta* to the small dark form found in the Highlands of Scotland and naming the southern type *A. a. amphibius*. This latter is the well-known "water rat" of our rivers, streams, lakes and canals, that dark-brown, rough-coated, comfortable-looking creature which sits at the river-side and, when alarmed, drops "plop" into the water to swim off, deep beneath the surface.

The water vole is of aquatic habits. It swims and dives with the greatest ease, lives in a burrow in the river bank and rarely goes far from the waterside. It is a most harmless and inoffensive animal, never interfering with other creatures and living wholly on vegetarian fare, yet it often gets the credit of evil deeds. It is most unfortunate for the water vole that it should ever be dubbed the water "rat" for this leads to confusion with the real rat, particularly when the latter takes a summer holiday at the riverside and desports itself in and about the river, at the same time amusing itself by looting eggs from the nests of moorhens, coots, and wild ducks, often from under the mother's very wing. I have even know a rat, a common or farmyard rat, *not* a water vole, swim after a brood of ducklings and seize one as it paddled behind the old bird. In sooth the common rat is a terrible desperado and almost as much at home in the water as the truly aquatic vole, so it is no matter for wonder that people muddle up the two rodents and give the one the blame for the bad deeds of the other. I must repeat that the water vole is quite blameless, indeed, it often suffers at the hands, or rather from the teeth, of *Rattus norvegicus*, which will evict it from its snug burrow and take possession of both its hole and nest.

The water vole believes in comfort. It may enjoy paddling in and out of the water, also diving amid the waterweeds, but when it comes ashore and shakes the moisture from its coat it wants a warm dry bed. This it makes of grass and rushes

in a chamber at the end of its tunnel, which nest serves both as a couch and nursery.

The little water voles, born blind and naked, are, by the time they come forth to see the world, miniatures of their parents, equipped not only with furry jackets, but an excellent set of watery instincts. They swim and dive without practice or instruction, for it is truly their native element, though their early excursions are not without risk, for a tender young vole makes a nice morsel for that freshwater shark, the pike, also that keen fisherman, the grey heron.

Now, in conclusion of this chapter, I must leave life at the waterside and turn to a mouse of the cornfields, that tiny, dainty, fragile mite known as the harvest mouse. It was of this fairy sprite in sandy-red that Gilbert White wrote: "Two of them, in a scale, weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois". I must break into his account to remark that when I weighed two harvest mice they dipped the scales at 66 grains and 86 grains respectively, Gilbert White went on to say that they were "of the squirrel or dormouse colour; their belly is white, a straight line along their sides divides the shades of their back and belly. They never enter into houses, are carried into ricks and barns with the sheaves; abound in harvest and build their nests amidst the straws of the corn above the ground and sometimes in thistles. They breed as many as eight in a litter, in a little round nest composed of the blades of grass or wheat. One of these nests I procured this autumn, most artificially plaited and constructed of blades of wheat, perfectly round and about the size of a cricket-ball, with the aperture so ingeniously closed there was no discovering to what part it belonged".

Although this description was written as long ago as 1767 (in letter XII of the *Natural History of Selborne*), it might have been penned yesterday and is a most accurate account. Alas! present-day naturalists have not the same opportunities of studying the harvest mouse that were possessed by our predecessors. Even 150 years ago its distribution in the British Isles was practically limited to England. It is said to have occurred in certain localities in the Lowlands of Scotland and in Wales, but this must have been very sparingly—and since then it has grown more and more scarce, until now we must seek it in the south-eastern counties, for it is extremely unlikely to be met with elsewhere. It may be found in the

cornfields, and likewise in the tangled vegetation of the reedy ditches of Norfolk. Here it is still carried at harvest-time into the rickyards, so that when the stacks are threshed wee mice scamper in all directions.

Why has this ceased to be the case in so many districts? The reason usually given is the extensive use of machinery in agriculture, of reapers and binders, of threshing machines and so on, which prove fatal to numbers of these tiny mice; but it is difficult to be sure that there is not some more fundamental cause, probably of a climatic nature, or arising from competition with another species or from disease, which has led to the disappearance of *Micromys minutus* from so many English counties. It is sad to add that the end of this diminution does not seem to be in sight, for we can ill afford to lose this fairy mite, which is unique among our British mammals by reason of its prehensile tail. This serves its owner as well as a fifth paw, enabling it to sit aloft on a swaying head of grain, securely anchored, and feast or wash its face with perfect freedom.

In this chapter we have shuddered at rats and abused the house-mouse, but this last of the mice is one of the most fascinating and delightful of small mammals. Let us hope its fortunes will mend, and that it may once more become a common animal of the harvest fields through England.

THE MOUSE

76 RABBITS AT HOME

The ubiquitous rabbit is found from sea-level to high up our hillsides, and such scenes as this are frequent on the common and by the hedge-side. The rabbits sit in the sunshine and amuse themselves; but they are on the alert, and at the least hint of danger will pass the alarm by a warning thump of the heel, and bolt to their burrows

77 Young rabbits near the mouth of their burrow, into which they are ready to bolt at the least hint of an onlooker

78 An adult wild rabbit. Note the tiny white spot on its forehead. This mark is frequent among the rabbits of some districts

CHAPTER IX

Hares and Rabbits

We have four species of hares and rabbits in the British Isles: the widespread rabbit, the brown hare of England, Wales and the Lowlands of Scotland, the mountain or blue hare of the high grounds of Scotland, and the Irish hare, the latter being as its name denotes, a native of Ireland.

The Irish and mountain hares are forms of the variable hare, so widespread over the northern regions of the Old World, which owes its title to the fact that its coat-colour varies with the season. In summer it is a darkish grey-brown but in winter it turns white or grey-white. The brown hare always merits its name, retaining its rich sandy-buff jacket throughout the year, but where it is found snow seldom lies long.

Although hares and rabbits have many features in common they are most dissimilar animals in certain respects, in particular as regards the state of their young at birth and the care bestowed on them by the mother.

The rabbit, *Oryctolagus cuniculus*, breeds several times in the year, gestation is thirty days and each litter consists of from four to seven young ones. More have been recorded. They are born naked, blind and helpless, but their dam makes careful provision for them. As their advent draws near she prepares the nursery, often, particularly in the early part of the year, digging an especial hole for them, though later on she may be contented with a quiet corner of the burrow common to the community. I must here pause to remark that whereas the hare never burrows, the rabbit is a great miner and is for ever digging. But whether the nursery is in a new tunnel or tucked away in an old one, it is furnished with equal care. The doe collects mouthful after mouthful of dry grass and carries it within to form a nest. I watched a rabbit one day very busy at this work, and she continued for ten minutes until a passer-by alarmed her. It is usually assumed that the buck is without any feeling of paternal responsibility; indeed some

persons aver that he is of uncertain behaviour towards his offspring and that one of the reasons the female hides her family with such care is for fear of his capricious temper. I doubt if he deserves the latter accusation and I believe him to have some regard for his mate. Whereas the hare is promiscuous in its maritial relations, there are indications that the rabbit has a tendency to pair.

A rabbit had begun to excavate a nest-hole in a bank in the garden, and looking out of a window—at eleven in the morning—I saw her at work. She was scratching diligently and throwing out the soil with strong kicks of her hind feet. While she worked a second rabbit, a big fellow with a broad forehead and one ear slit, sat about eighteen inches away. She continued work for an hour, the buck remaining beside her all the time, and then the two departed together. Unfortunately, further observations on the couple were prevented by the combined efforts of the household cat and terrier.

The finished nest-burrow is about one yard in length, and in addition to grass the doe lines the inner chamber with a quantity of wool plucked from her own sides. In this beautifully warm bed the newly-born babies lie in comfort despite the speedy departure of the dam, who leaves them soon after their birth, though she takes the precaution to stop up the hole. She scrapes the excavated soil into the entrance, fills it up, smooths it over and departs, leaving little to betray the location of the hidden family. Yet despite the care with which the young rabbits are concealed, many families are discovered by foes with keen noses. Foxes and badgers are adepts at finding and digging out the litters. A badger will locate the exact spot where lie the little things and scratch a shaft down to them, when the rest of their story takes little telling. However, far from regretting such happenings, we must commend them, for the rabbit, with its remarkable powers of multiplication, is a sore menace to agriculture and forestry, and everything which helps to keep it within bounds is something to the good.

Reverting to details of the domestic arrangements of the doe rabbit, she is certainly not an attentive mother. Having left her family stopped into their nest burrow, she is content that they should remain there and visits them only when absolutely necessary. A rabbit I had under observation went to her little ones only once in twenty-four hours, but it is

dangerous to generalise from a single instance. This rabbit had dug a hole beneath a fir tree close to the house. I removed a sod of turf over the nest chamber by which means I could inspect the family without disturbing the stopped-up entrance hole, the soil of which the mother had to scratch out and fill in again every time she visited her offspring. To know when she had done so I drew marks, a cross to be precise, on the loose but level earth. So long as my marks remained I knew the rabbit had not been home. I inspected the hole last thing at night and again before it was light in the morning. Nothing was disturbed during the night, but my marks vanished and the hole showed signs of a visitor each day between 5.30 a.m. and 7.30 a.m. After this it was again left undisturbed until the following morning. By means of my "spy hole" I kept notes of the progress of the young rabbits which grew and flourished splendidly and afforded me some truly interesting observations.

Young rabbits quickly change from pink to lead colour and then grow coats. Their eyes open, they become quite active, their mother no longer bothers to close the hole and they hop out to nibble grass, after which she ceases to concern herself with them and turns her attention to her next litter, It follows shortly.

For practical purposes, rabbits may be said to breed all the year round. In southern districts and on light sandy ground young ones may be found during every month of the year, but in more northern districts and in wet cold ones there is a respite during November, December and January.

Given favourable conditions, that is a dry mild time combined with sufficient food, it is appalling how rabbits will overrun the countryside, and that despite the utmost efforts of farmers, rabbit-catchers and gamekeepers, also of such natural foes as the fox and the stoat. The latter, which hunts for sport as well as for food, is a valuable ally in the war against rabbits, relentlessly killing considerable numbers. It is indeed a mighty hunter, and when it picks up the scent of a particular rabbit that one is doomed. And, what is truly remarkable, the rabbit seems to know it is fated. I have seen rabbits pay no attention to a playful stoat in their midst; I have known a doe rabbit attack a stoat: yet the average rabbit when it discovers it is pursued by a stoat becomes stupid with terror, sits down and lets the hunter come up and spring upon it.

In days gone by polecats and wild cats helped to keep rabbits in check, and there was also the pine marten to take toll; but these three animals are now exterminated in most parts of the country. Although the rabbit has been here a very considerable time, it seems, as geological periods go, to be a comparatively late arrival, having spread northwards from the Mediterranean region, partly by its own efforts and partly with mistaken human assistance, to reach northern Europe, including Great Britain and Ireland. Even yet it is spreading and invading districts where it was formerly unknown, or at any rate comparatively scarce. I have talked with elderly inhabitants of the Lake District who assured me that in "their young days" there were very few rabbits in the dales. Now they are numerous in every valley, and extend far up the fell-sides. It is the same in the Highlands of Scotland where the rabbit steadily gains ground. Its colonizing powers abroad have been demonstrated with dreadful effect, as in the devastated parts of Australia.

Like most of the rodents, the rabbit shows a tendency to periodic increases and decreases, a peak year being followed by a marked decline due to disease of one kind and another, particularly a form of coccidiosis, in which the liver is affected.

Although the rabbit collectively is a menace to mankind, rabbits individually are charming animals, and there is no more delightful sight than to watch them on a summer evening feeding in some sheltered corner at the verge of the woodlands. They hop about, skip, play and scamper, sit up and wash their faces with strangely cat-like gestures, and then nibble the grass sedately.

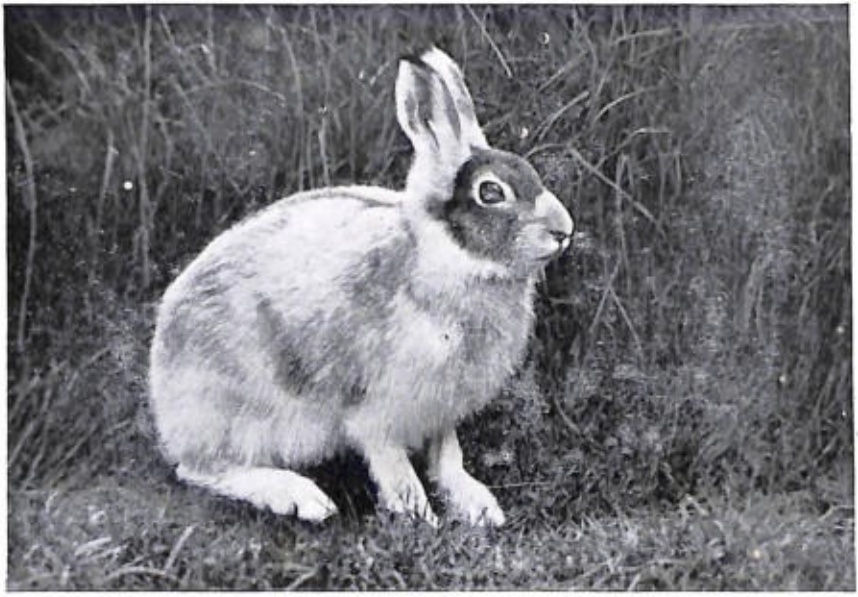
The rabbit is very particular about the care of its person, and it is continually dressing its fur, licking its toes and putting itself in order. Under ordinary circumstances, however wet and dirty its surroundings, a rabbit will keep itself perfectly clean. It is only when worried and alarmed that it gets clay on its feet and mud on its person. Except when alarmed a rabbit is as careful where it steps as any cat.

Apropos of being alarmed, how different is the demeanour of the happy, confident, unafraid rabbit and that which suspects danger. The latter, especially if it thinks it can slip away unseen, turns down its white fluff button of a tail, so that only the dark back is visible and there is nothing to catch the eye, and sneaks off quietly. But, on the contrary, when

79 A "jack" hare, with his long ears erect, listening for possible danger, and ready to bound away at the least hint of it

80 Leverets. It is unusual to find so many as five together, two or three being more general

81 A mountain hare in its dark summer coat. It will be seen that its ears are shorter than those of the brown hare



82 A mountain hare in nearly full winter white. But even when the change is complete it will retain the black tips to its ears

THE MOUNTAIN OR BLUE HARE

rabbits are feeding together in the open and something frightens them, they dash away with their white tails bobbing conspicuously.

Rabbits are social animals and have certain community impulses, such as passing on information of danger, the danger signal being a thump on the ground with the heels, which thump is surprisingly far-carrying. Many persons believe that the white tail also serves as an alarm sign, and that it helps to guide young and inexperienced members of the community to the home burrow and safety.

Normally, that is when going out to feed and proceeding happily and undisturbed, rabbits travel along their established paths or "runs". These roads may be traced for some way across the meadows and often bring about the downfall of the owners, for it is in them that the rabbit-catcher sets his snares or "wires" by which he captures numbers of rabbits.

We do not usually think of the rabbit as an emotional or temperamental animal, but the old bucks frequently bear signs of combat, such as slit ears and ears from which bits have been torn; and I have seen rabbits fight like demons. The ordinary type of fight consists of manœuvres to get an advantage, so that one of the duellists may spring over the other and deal it a blow with its hind feet. In short, they try to kick each other, but I have seen rabbits come to grips.

I came upon two bucks in furious battle. The one had got hold of the other by the neck, and the two were rolling over and over on the ground. They were so intent on one another that I was able to approach very close; indeed they rolled almost to my feet, when at last they realised my presence, let go of each other, sprang to their feet and scampered off, looking most dishevelled as they did so. It would need a great deal of licking and washing before they were tidied up again.

The hare shares the rabbit's fastidiousness and dislike of getting dirty, and like it spends much of its time in washing and dressing its fur—perhaps even more time than the rabbit, for it lives entirely in the open, exposed to wind and weather, while the rabbit seeks shelter underground and often rests for hours in its snug dry burrow.

Perhaps one of the most outstanding differences between our two, or rather three, hares and the rabbit, is that the latter

goes to ground and lives habitually in a burrow, whereas the the former only seeks shelter in a hole under exceptional circumstances. The rabbit is a great digger, the hare is no miner. The hare always lives in a form open to the sky, but the rabbit, although it will sit in a form, only does so as an adjunct to its burrow, much as we use a summer-house in the garden as a pleasant extra for sitting-out purposes. Moreover, the hare is essentially an animal of the open country, whereas the rabbit likes the shelter of the bushes. The brown hare is most plentiful on our biggest arable fields and on the rolling downland, where it can speed lightly across the turf on those long legs which propel it with such swift ease. An old jack hare of the downs gallops a great pace, so that even the stoutest of greyhounds may find him too fast for it. Yet our brown hare is not so big and, therefore, probably not quite so fleet, as the brown hare found in many parts of the Continent. *Lepus europæus* is widely distributed across Europe, including Russia, being found wherever suitable open country occurs. It varies somewhat in different areas, often sufficiently to merit such local races receiving subspecific titles. The hare found in England constitutes, for instance, the sub-species *L. e. occidentalis*.

Considering that the hare is a defenceless animal, with not even a burrow in which to take refuge, and that it does not multiply so fast as the rabbit, it is amazing that it holds its own so well. Protection for sporting purposes is undoubtedly valuable to it, but against this must be set the fact that the farmer, even if not the owner of the sporting rights, is legally entitled to destroy it, and when it raids his sugar-beet and such crops does not hesitate to do so. Nevertheless, a sandy-brown shape, galloping with easy action across the fields is a frequent sight in the countryside at all seasons, as in the spring time when we often view hares playing the fantastic antics which have made the "mad March hare" so well known as the type of all that is silly and foolish.

The hare presents an interesting study in animal psychology. Its character is a curious mixture of extreme timidity and boldness, of rashness and suspicion, of cunning and of the most flagrant silliness.

I once had a pet hare. It was a male, had been brought up by hand and was thoroughly domesticated, living in the house and being perfectly tame. Topsy had no fear of any

person. My knees afforded him a comfortable seat when he wished to warm himself before the fire of an evening, and he also made use of my mother's lap, where he would roll on his back, stretch out his long legs and lie in a queer cat-like attitude. Though there is no true affinity between this typical member of the order *Rodentia* and the cat, there is undoubtedly something very feline about the hare, and it is easy to understand how the custom of speaking of it by the name of "puss" has arisen.

Topsy, as I have said, was "as bold as brass," yet a more temperamental creature never walked. The slightest strange thing would upset him. I have seen him flee in crazy panic from his own shadow moving on the wall, temporarily mad with terror and liable to injure himself in his headlong, heedless flight.

A hare when running from anything usually looks back. Its eyes are placed so that it can do this as easily as it can look forward, and it seems to give far more attention to what is behind than ahead. This sometimes causes it to run into things that bar its path. One day, when out with the fox-hounds, I and some other persons on horseback were standing by a gate when a hare alarmed by the sound of the hounds, came galloping towards us. It was evidently accustomed to passing under the gate, and was hurrying to leave the field by its usual exit, looking back all the while and paying no heed to what was before it.

On came the hare, and it was only at the last moment, when it was almost among the horses, that it stopped short, bounded aside and sped off, faster than before, in the opposite direction, when it almost galloped into the very hounds whose voices had startled it!

People sometimes ask if animals of the hare type, so easily alarmed, so quick in their reactions and of such nervous temperament, live a miserable life of trembling fear. It is my belief that the opposite is the fact, and that they are particularly happy creatures, troubling little about the past, still less about what is to come, and living for the fleeting moment. Alarm passes with them as quickly as a cloud shadow on a windy day sweeps along the hillside, and the panic of one second gives place in a brief instant to joy, anger, or happy content.

I have seen my Topsy after having been driven quite silly

by his shadow on the wall, dance in the most cheerful manner, and then in another moment become exceedingly cross. He was always angry when I got in his way. If he wanted to leave a room and I tried to stop him he would stand up on his hind legs and hit at me with his forepaws, uttering queer little grunts the while.

The temperamental nature of the hare is well exhibited in the early spring; indeed, the mad March hare has become proverbial. When you say that a person is "as mad as a March hare" everyone understands that he is indeed irresponsible, and certainly hares in the first months of the year do appear crazy creatures.

Breeding begins in February, exceptionally in January, but it is not until the March winds begin to blow that the jack hares give their best performances. Normally animals of the night, by which I mean that under ordinary circumstances hares rest in their forms by day and go out to feed under cover of darkness, they forget all rules and may then be seen abroad at midday. Long-legged, long-eared forms are to be viewed on the fallows, on the downs, and other places where hares like to disport themselves, often in little companies of twos and threes. Ordinarily the hare, whether brown, mountain or Irish, is of solitary disposition, having peculiarly little craving for society, but now males and females may be seen together, and sometimes two or three jacks can be watched vying with one another for the favour of a lady. Combats ensue, grave affairs carried out in ludicrous fashion, when the duellists face each other, stand on their hind legs and hop around, pushing and hitting with their fore-paws just like boxers. Although, so far, the matter is one of mad solemnity which has little result except to make the fur fly, it may lead to a truly serious climax, when one hare or the other sees a chance to leap over his opponent and deal him a good blow with his powerful heels. However, as a rule, these fights terminate inconclusively, and the duellists depart, none the worse save for the loss of a little fur, upon their respective businesses.

Hares are promiscuous in their relations between the sexes, and there is no evidence that the male takes more than a passing interest in the female, still less that he has any concern for his offspring.

The leverets, as has already been remarked, are well

developed at birth, being beautiful little things, with thick furry coats and bright eyes. It is a curious fact that many little hares have a tiny white spot on the forehead, but this is lost when they grow up.

The dam makes no preparation for her family. A form or sitting-place in a furrow, under a tuft of grass or in the green growth of a crop of clover, has to serve the leverets as a home and nursery. It is quite unfurnished. The hare never attempts to make a nest.

The litter is not a large one, two or three leverets being usual, though four are met with now and again. The mother that has reared an early family will probably manage another before the summer has gone, but the hare is not nearly so prolific as the rabbit, which so far as multiplication is concerned beats it easily.

Stories are sometimes told of hare and rabbit hybrids; indeed some persons believe that the fine domestic rabbit known as the Belgian hare has brown-hare blood in its veins—but this is not so, the Belgian "hare" being merely an example of the breeders' art as exercised upon the rabbit.

There is no scientific evidence in support of the idea that the hare and rabbit will cross, and there are many reasons for doubting the possibility of such a thing, such as the difference in the development of the young at birth and the contrast in their methods of rearing their offspring. The notion that brown and mountain hares may sometimes hybridise is not so unlikely, but before considering it we must give the latter some attention.

The blue or mountain hare, so widespread throughout northern Europe and known as *Lepus timidus*, is represented in Scotland by a geographic race which has been considered worthy to have a name of its own, so is entitled *L. t. scoticus*.

It is a rather smaller and more compactly built animal than the brown hare. A big brown hare may weigh eight pounds or even more, but it is rare for a mountain hare to be more than five pounds. It is not so long in the leg, nor has it such long ears; in fact, it is of more rabbit-like type, though nevertheless it is a true hare and has the black-tipped ears of its tribe. These it retains even in mid-winter when in full winter white.

The winter change is effected by an autumn moult, long grey-white hairs coming through the summer peltage which

is cast off as the new jacket is acquired. This change appears to be a matter of heredity and independent of latitude and temperature; at any rate, a hare I brought south as a leveret and kept in the English Midlands adhered to the correct time-table and duly acquired a white jacket during the mild winter when there was little frost and no snow fell.

That the ability to change colour in winter is of protective value seems to be indicated by the fact that the allied Irish hare, living in a country of equable seasons where snow seldom falls and rarely lies long when it does come, has almost lost the tendency to turn white. No doubt in a green countryside the winter change, far from being protective, would be the opposite, and elimination of white individuals would proceed briskly.

The native hare of Ireland, though allied to and of very similar type to *Lepus timidus*, has sufficient points of difference to merit it having full specific honours, so it is known to zoologists as *L. hibernicus*. It is rather larger than the Scottish hare and of a more russet colour. The Highland animal, even in midsummer, has a dull grey-brown appearance, but even the Irish hare does not achieve the rich sandy-buffs and reds of the brown hare, which is ever a handsome animal.

The question whether, where their range overlaps, the brown and mountain hares may not now and again interbreed, is raised sometimes by the appearance of individuals of abnormal colour, and so on. All mammals are subject to variation, and no character is more unstable than coloration, so it is difficult to be positive about the matter; but I can say I have seen a nearly full-grown leveret which made me wonder if it really was a pure-bred mountain hare. In length of limb and of ear it was certainly *scoticus*, but its coat did suggest *occidentalis*.

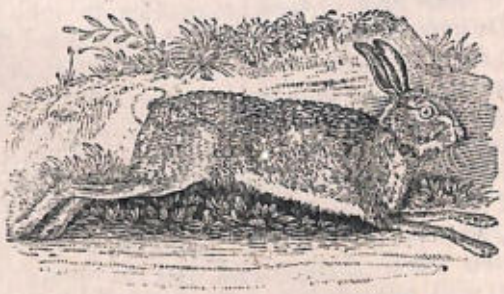
Although the mountain hare in the British Isles is confined to the more bleak and inhospitable regions, it breeds as early as, possibly earlier than, the brown hare, and often has strong leverets running around by April. Yet it takes no more care of its little ones than its relative of the south. They may be deposited in a crevice between the rocks, or beneath the shelter of the heather, but considering the bleak winds that blow early in the year their treatment is Spartan indeed. However, they flourish, two, three or four of them to a litter.

The mountain hare has all the " hare-brained " character

of the brown, and is no whit more sober, being a feckless, irresponsible animal. Jock, the mountain hare I kept for a while in order to study his coat changes, and in the hope of mating him with a brown hare, came to an untimely end because something startled him and he bounded against a wire-netting fence with such violence that he broke his neck.

Mountain hares are not easy to keep in confinement as they are liable to liver and digestive troubles if fed on rich luscious food. On their native moorlands and mountains they get nothing better than hard wiry grass, bilberry shoots, heather shoots, twigs of bog myrtle, birch and so on. Nevertheless, I kept my Jock on cabbage leaves, oats, bran and the other things given to tame rabbits, and he was in good condition when he met with his accident.

Although the English farmer has ever a grumble for what the brown hare does among his crops, it is nothing to the complaints levelled at the mountain hare in its northern home. The farmer there has a good deal to say. The hare comes down from the moors and raids his fields, he avers, and the forester tells of plantations invaded and young trees damaged. To make the case worse, hard living and much galloping makes the blue hare a stringy, wiry beast of little value for the table, so that while the brown hare may expiate its offences as a delicious dish, no such atonement is within the power of its northern relative. In fact, the blue hare is little good to us, dead or alive, though the naturalist must put in a word for an interesting and attractive animal which is appreciated by the golden eagle, the fox. the wild cat. and other creatures of the hills.



THE HARE

CHAPTER X

The Deer of the British Isles

LEAVING the rodents, we pass on to those handsome animals, the deer, of which we have three species in these islands: the truly native red deer, the roe deer which is also indigenous, and the fallow deer, in connection with which the word "native" cannot be so certainly employed. But of this last deer's claim to be a true member of the British fauna more presently.

The red deer, *Cervus elaphus*, must be considered first. It is an undisputed native, so much so that our race, which shows points of difference from the various continental races of red deer, has been given a sub-specific title, and is known in full as *Cervus elaphus scoticus*. Whether it deserves to be regarded as a distinct sub-species, whether its differences and those of the Continental sub-species are due merely to environment and food, is another matter. We do know that "feed" makes all the difference to antler development in deer.

But this is getting on too quickly; we must not deal yet with the stag's antlers, but consider first the distribution of our finest wild animal. Formerly the red deer was found wild throughout the length and breadth of Great Britain and Ireland, taking shelter in the forests by day and coming forth at dusk to raid crops and graze the grass in the meadows, but not even the most loyal of subjects could view such visits with delight. Despite deer being rigorously protected throughout the Middle Ages for the benefit of the King and his noblemen, wild red deer gradually became exterminated in all cultivated areas, though considerable herds were enclosed in many parks.

At the present time the Exmoor deer represent the chief stock of wild red deer in England, but there are a certain number of deer on the Lakeland fells. In Scotland deer flourish, large areas of otherwise profitless mountain country being termed 'deer forest" and left to their occupation. Those not well acquainted with the red deer and deer-stalking as practised in Scotland, are often puzzled by the

83 FALLOW DEER

Fallow deer are ever beautiful animals, whether of the dark, light or white varieties. In this picture we see a party of bucks at rest in the summer sunshine, all three types being present in the group

[*From a Water Colour by George Barret, jun.* ; *The Animals by Robert Hills*

use of the word "forest" in this connection. Accustomed to the word being used to denote a large woodland, it surprises them to find it employed in connection with a more or less treeless region. However, such use is but a continuation of that of olden days, when "forest" meant any untilled region where wild animals roamed.

Of course, in the present-day forests of Scotland, the deer are most carefully preserved; indeed, no British mammal owes its survival more entirely to sporting interests than *Cervus elaphus scoticus*. On Exmoor it is protected because of stag-hunting, on the fells and in Scotland for stalking. If hunting came to an end and all sporting rifles were put away, the red deer would soon go. No naturalist who has watched deer, whether stags or hinds, on a Highland mountain-side could think of such a thing without sorrow. Let us hope it will never come to pass.

Deer are essentially gregarious creatures, yet (except in the breeding season) they tend to separate into herds of hinds and young deer with the stags in distinct parties. It is interesting to lie on the hillside and watch deer through a telescope, noting how alert they are for any taint upon the wind, and how slight a hint of an intruder will be sufficient to make them move off.

Apparently they place little trust in their eyes. One day I, with two others, was sitting in a small corrie eating my lunch and at the same time watching some deer pass along the mountain side, when a hind, which somehow had got left behind, came trotting after her comrades. Her path brought her towards us. The wind was blowing from her in our direction so she could not smell us, and, despite the fact she was in close view of us, she continued to come on. At about twenty-five yards distance she stopped and stared hard at us, but we remained motionless. She stood there, evidently completely puzzled and without in the least recognising us as human beings. Suddenly a gust of wind blew from behind us to her, and of course took our scent to her. She bounded in the air and galloped off exactly as if she had been hit.

The stags shed their antlers each year, much as moulting birds shed their feathers, and new ones are grown in the course of the summer, these developing antlers being covered with a soft velvet-like substance. At this stage the antlers

are in a delicate condition and a blow might harm them, but as they attain full growth they become hard and insensitive, the "velvet" peels or is rubbed off, and the stag is once more in possession of formidable weapons with which to do war upon a rival or attack a weaker brother.

The experiments with the Warnham Court deer which were so beautifully illustrated by the late J. G. Millais in his classic work on "British Mammals," show the effect of high feeding and good living in the production of record "heads." In 1892 there was a stag with 48 points to its antlers living in the park, whereas a wild head, having ten or more points, is considered quite good.

A stag's antlers improve at each successive "moult" until he reaches his prime, after which they decline. He is probably at his best at about seven or eight years old, when he is a splendid fellow, though many persons think the Scottish stag would be still finer if there were fewer deer in the forests and if poor individuals were carefully weeded out. Too often it is the best stags only which fall to the rifle, and when their turn comes the fattest hinds, so that indifferent animals are left to form the breeding stock. In fact, it is elimination of the best, not of the worst, which is practised. Certainly the antlers remaining from days gone by, such as those found buried in the peat and lying in caves, often surpass the modern product, while Continental deer generally carry better heads than ours.

Apropos of the use to which the stag puts his armature, wild deer keep their antlers to do combat between themselves, but park stags, which have lost proper respect for human beings, are often exceedingly dangerous. When the rutting season arrives in the early autumn the stag becomes greatly excited. Then he lifts up his voice and it carries far across the heather of Exmoor, of Scotland, over the fells of the Lake District and beneath the trees of many a park. When heard under the said trees, prudent persons give him who roars a wide berth. Many people have been attacked and injured by stags, and fatal accidents have been known. Tame deer of all species are difficult pets. The red deer is far too big and strong to be trusted even when half-tame, and should always be regarded with suspicion.

The rutting season does not last long, but is, while it endures, a time of high excitement. Each stag tries to

84 THE RED DEER

The male red deer, otherwise the stag, is undoubtedly the finest and most impressive animal we have in the British Isles, at least when his antlers have attained their full development. These are shed and regrown every year

85 RED DEER IN WINTER

The Scottish red deer have to face severe weather during the winter. This photograph shows a party of stags driven down from the hills by a heavy snowfall, but they are shy and suspicious, and ready to make off at the least alarm

86 A Dispute. When hinds fall out, likewise stags when they have shed their antlers, they rear up and fight with their fore-feet

87 The Challenge. This remarkable snapshot shows a stag uttering that roar which is a defiance to all other stags within hearing

88 Stags seeking food beneath the snow, with the stern mountains of the Scottish Highlands behind them

89 A summer scene: stags "in velvet" resting in the shade of the trees. Note the two white stags. White individuals often occur in park bred herds of red deer

RED DEER, SUMMER AND WINTER

collect a harem of hinds, keep his ladies together and prevent his rivals stealing them from him.

For the greater part of the year the deer have their home areas and, unless disturbed, do not wander far, but in September, with love their master, the stags roam about and a stag well known in one forest may be discovered some miles away in another. But so soon as this brief season of feverish excitement is over, of roaming and challenging, of hectic journeying and desperate efforts to gather hinds, the stags subside, for they are now thin and worn, and badly in need of rest. Their pugnacious spirit leaves them. They seek consolation in each other's society, and not one angry roar echoes along the mountainside.

Winter is a very hard time for the deer in Scotland; food becomes exceedingly scarce on the high ground, and necessity compels the animals to seek a living lower down. On most forests assistance is given, but even so the winter storms take toll and many die before spring arrives. Fortunately for the hinds their fawns are not born until the end of May or June—gestation is a little over eight months—so that conditions are usually more favourable before they come into the world.

As her time approaches, the hind leaves the herd and goes off by herself, to hide her single offspring in some sheltered nook. Twins sometimes occur, but are exceptional. The new-born fawn is a lovely little thing, beautifully marked with light spots on a reddish-fawn ground. It has been suggested that this colouration is of concealing value during those days when the youngster has to be left lying in hiding; however, its legs soon gain strength, and it is able to leave its "form" and run after its dam, when it is comparatively safe, for whereas during its first few days anyone could have picked it up, no athlete, however great a runner, could catch it now.

Reverting for a moment to the stag, having got through the winter, he sheds his antlers in the early spring. They fall off, leaving him a mere shadow of his former magnificent self; but it is a curious fact that very few shed antlers are found lying about. Some drop into peat holes and are lost, but more are *eaten by the deer*.

The reader will exclaim at such a statement, thinking it must be, to say the least, wide of the mark, but it is an assertion of bare fact. The deer have seemingly a craving for

salt and lime, and they suck and chew the shed horns until they chew them away. I have found the stumps of red deer antlers of which only the base was left, likewise a roe deer's skull from which the horns had been eaten away. This latter skull I kept as a remnant of much interest.

Next to the red deer, the roe is certainly our most interesting deer. It is likewise an indigenous species, probably found here before man invaded the land, and it is still fairly plentiful in many districts. Moreover, it owes much less to protection than the red deer.

Whereas our largest deer is so carefully conserved, the tiny roe, no more than 25 inches in height, is often looked upon as a useless little nuisance and treated accordingly. Nevertheless it continues to flourish in the old pine forests of Scotland, in the oak woods of the Lake District, and in similar woods in the South of England. It has never been known in Ireland.

It is a non-gregarious species, a buck, a doe, their twin fawns and, perhaps, a yearling, being the largest gathering usually met with, though it is much more common to catch a glimpse of a single deer slipping away through the woodland undergrowth.

The roe is essentially a forest species, and by "forest" we here mean woodland, for the word is now being employed in its more usual sense. This small and dainty species loves not only the shelter of the trees but to browse on such of their shoots as it can reach and upon the leaves of the bushes.

Capreolus capreolus thotti is the scientific name given to the roe deer in Great Britain, which has been separated as a subspecies from the roe of the continent of Europe because of its darker face and other points of distinction; though as we see it, a fleeting shadow in the woods, we seldom get time to study precise details such as the colouration of its face. Yet one day I did get ample time to gaze at a roe buck. It was in a Scottish pine forest, one of those tracts of country where man's influence has been slight, where ancient, red-stemmed, lichen-festooned firs rise from an undergrowth of bilberry, broom and heather, much as they did when our only weapons were those of flint and stone. It was a warm afternoon, the sun shone from a blue sky on the broom, the flowers of which were like a sea of gold, and from them came waves of heavy scent of drowsy influence. I sat down with my back to a pine

stump and the forest world faded from me—or rather I was back in an earlier epoch when primitive man with a wolfish dog hunted beneath the pines. "Wouf! Wouf!" barked the dog, and I woke to realisation of an actual sound. Was a dog barking at me? No, it was a roe buck! He stood perhaps fifteen yards away, a picture of puzzled curiosity, staring intently at me and uttering his bark of mingled surprise and alarm. Perhaps I moved as I awoke, perhaps he caught human smell amidst the strong scent of the broom; howsoever it was, he swung suddenly around and bounded off under the trees.

This little buck carried nice antlers of the usual pointed type. In one or two places Japanese roe have been introduced, with consequent alteration of the horns, but his were truly British. By the way, "antler" is the correct word to use for the head weapons of deer, but it is by no means descriptive when applied to the short, sharp growth of the roe, so I will err in good company, such as that of the late J. G. Millais, and refer to them as "horns." Although importation of foreign stock may give fresh vigour to the home breed, the naturalist will ever deplore the introduction of alien blood, so liable to bring about the loss of the indigenous type. Our native roe may not carry such horns as that of Central Europe, and may be much surpassed by the Japanese, but it is our very own, with native peculiarities, so let us keep it pure and free from admixture.

As roe browse so much on twigs and shoots they are not welcome guests in plantations of young trees, and in many areas where extensive plantations have been made they are regarded as little better than vermin, being driven to persons awaiting them and shot with guns. Somehow or other one feels some prejudice against using a shot-gun for a deer, even the tiny roe, and it is to be hoped some more suitable method of dealing with this sporting little animal may be devised.

Frequent in the Scottish woods, the roe becomes less plentiful as we go southwards, though it is fairly numerous in many of the woodlands of Cumberland and Westmorland. It occurs in some parts of Southern England, particularly Dorset, but its presence here seems to be due to re-introduction from the north.

The roe is an animal of certain outstanding peculiarities with regard to its breeding. Mating time is in the late

summer, that is, during July and August, but the fawn or fawns—for, as mentioned before, twins are quite common—are not born until the next May or June, although gestation has not been proceeding during the entire period. Careful investigations show that there is no development of the embryo until mid-winter, but about Christmas-time it begins and then proceeds as in most other mammals. Roe fawns are delightful little things, and tempting creatures to keep as pets, but, like all tame deer, they are apt to become very mischievous. One that I heard of, which had been hand-reared by a devoted mistress, grew up to be a handsome little buck, and grew likewise into such an intolerable nuisance that she had to give it to a Zoological Garden. This buck made such use of his pointed horns that everyone feared him.

With regard to the employment of their antlers by deer, it is noteworthy that red deer, although they use them during the rutting season, when they not only do battle with them but have been found with their antlers so interlocked that the combatants came to a miserable end, at other times rear up and strike with their forefeet. It is a common thing to see them sparring, standing aloft and hitting at each other like boxers, but such matches are rather an outlet for high spirits rather than duels *à outrance*.

Now, having considered our two truly native deer, we come to the third species on the British list, the one that is probably the best known of all, but which many people declare is but an introduction from abroad—I mean the fallow deer.

This lovely animal, midway in size between the roe and the red deer, has ever been the most popular of the three as an ornamental inhabitant of our parks. The number of herds of fallow deer kept under semi-domesticated conditions in these islands is difficult to compute; in addition, wild fallow deer have existed for a very long time in the New Forest in the South of England, and odd parties of deer have maintained themselves here and there about the country. At the present time fallow deer leading a truly wild existence occur in all sorts of places, and the large plantations of the Forestry Commission afford them good sanctuaries.

The beauty of the fallow deer, especially of the buck with his palmated antlers, has been appreciated from early times, particularly by the Romans, who are said to have brought the fallow deer here with them. So many things about which

we are not really certain are laid to the credit of the Romans that it is difficult to know which of them is correct. In this case it is probably true that the Romans did bring in fallow deer to grace the enclosures about their villas and add much loveliness to the view, but the real question is whether the deer of the Roman introduction are the origin of our present fallow deer, or whether there were already wild fallow deer in the land.

There is good reason to think, despite the number kept under semi-domestic conditions, that we can claim the fallow deer as a truly indigenous wild animal, for remains of a deer very like this species have been found in comparatively recent deposits. It has been suggested that *Dama dama* was exterminated and re-introduced, but as quite wild fallow deer have existed in the New Forest from very early times, it seems more probable that here we have our truly wild stock, and that it shows us what the fallow deer is like when away from comfortable park life. In any event, we can in the New Forest study deer under quite natural conditions.

The fallow is perhaps a more social animal than the red deer. It loves to congregate in large companies, but these are usually of one sex or the other, and the younger animals tend to herd with those of their own age.

Truly wild and gone-wild fallow deer may be found in mere twos and threes, but this is not from choice, but force of circumstances. These wild deer are timid creatures, lying up in dense thickets by day, though coming forth under cover of darkness to raid the adjoining crops. Although so wary, deer do not impress the casual observer as being animals of especially high intelligence; yet under such circumstances, with every man's hand, and gun, against them, they display great cunning.

Several deer, two or three bucks and a like number of does, escaped from a park in South Shropshire and took refuge in some extensive woods. Little was seen of them, they kept out of sight, and soon their numbers increased, when they spread into neighbouring woods and began to make nightly expeditions into the fields. The farmers got annoyed, very annoyed indeed, when their mangolds, swedes and sugar-beet suffered, and vengeance was sought. Irate agriculturists sat up armed with guns and rifles to shoot the raiders, attempts were made to catch the deer in snares, and other poachers'

devices were tried with little result. One young buck was slain, but that was all. Better results were obtained by driving the deer in the woods with beaters, but even then the toll taken was not large. Fallow deer are still present in these woodlands and seem to have established themselves securely.

With regard to escaped deer, a peculiar thing came under my notice when a young buck that had got out of a neighbouring park entered a field in which there was a large herd of pedigree Hereford cows. These cattle were great, fine, stolid creatures of particularly quiet, easy-going temperament, yet when the little buck appeared, bounding lightly along in the usual deer style, they lifted their heads, stared in a startled manner and gave a simultaneous bellow. Then, with one accord, they charged it, and the nimble deer had no chance. It was killed instantly.

Horses, too, often betray dislike of deer, and I have seen them bolt in fright from fallow deer in a park, as in the case of a hunter mare, which, alarmed when some bucks leapt up out of the bracken, dashed off, despite her rider's endeavours to pull her up, and ran away with him until a stream barred her course, when she stopped suddenly and he shot over her head to fall with a great splash into the water.

Yet, however horses may view fallow deer, in what I was almost going to term their "natural" environment of undulating parkland, dotted with great trees, with some stately mansion in the background, few persons will differ from the verdict that they are remarkably beautiful and decorative.

They differ in appearance with the time of year. In summer, with the sun gleaming through the green foliage of the shady trees, it seems as if it has painted them with pale spots, for they, or rather I should say, members of the typical race, wear reddish-fawn coats with light spots. In autumn the dappled coloration is replaced by a plain dark-brown coat.

Many naturalists consider that the spotted summer uniform is a protective adaptation, evolved in the days when the fallow deer roamed wild in all great woods, which renders its wearer very difficult to see as it lies beneath the trees. They point out that, as the leaves fall from the trees and the light passes through bare branches so that it no longer makes strange patterns of bright spots on what lies below, the deer shed their dappled jackets and assume a garb suitable for escaping

90 A roe buck taking his ease. Note his short, rough, sharp, pointed antlers

91 A March snapshot in Richmond Park of red deer at rest, and in act of chewing their cud

92 A party of fallow bucks in the summer, seeking shade beneath the trees. These are of the dark type

93 A fallow buck of the spotted type in summer coat. It should be compared with the deer on fig. 92

observation under the new conditions. However, a good many fallow deer never wear spots. Like all animals that have come under the influence of man, this deer is subject to considerable variation in coat colour. White individuals are not uncommon, and white strains are maintained in some places. In contradistinction to such albinistic departures from type are the very dark deer, of melanistic tendency, which are also by no means uncommon. Yet neither the sooty-hued deer nor the white ones can compete with those of the typical form for charm and distinctive appearance. It is the spotted fallow deer which is *the* deer of "the stately homes of England."

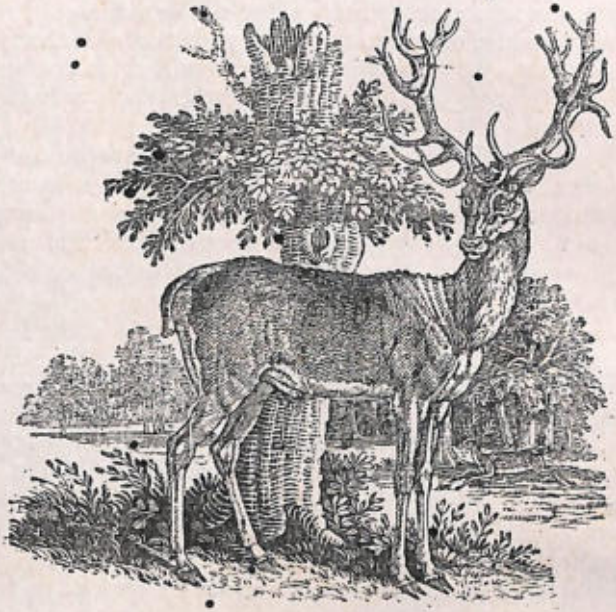
The life story of the fallow deer is much the same as that of the red deer and the roe. The buck becomes excited as mating-time approaches, and raises his voice to challenge his fellows; but, having rent the September air with his calls, he subsides, again seeks the society of other bucks, and lapses into community life for the rest of the year.

The doe gives birth to her fawn in the following June or July, sometimes two of them; but triplets rarely, if ever, occur. The mother lets her new-born baby rest for a few days under the shelter of the bracken, in long grass or under other cover, but as soon as it is strong enough to follow she lets it come with her into the general company. That company, which knows so little of the troubles and fears which beset wild deer, which can graze when it pleases and rest how it likes, nevertheless behaves according to hereditary custom, feeding in the still hours of the evening and early morning and resting while the sun rides high in the sky.

The topic of this book is *Wild Animals in Britain* and not the things to which they contribute, yet we cannot leave the subject of deer without further reference to the stag-hunting on Exmoor and the buckhounds which chase the fallow deer of the New Forest.

The Devon and Somerset Staghounds and the New Forest Buckhounds are institutions to which the deer owe much, for they ensure the protection of the red deer of Exmoor and the fallow deer of the New Forest, and without the incentive of sport it is certain that in neither area would these animals be exactly popular. Just as the sport of stalking has ensured not only the continuance, but a very large population of deer in Scotland, so has stag-hunting been the means of saving the

deer of Devon and Somerset and keeping them going under the best of conditions. While stalking and hunting flourish we may be sure all will be well with the wild red deer of the north and south, and the old-established wild fallow deer in Hampshire.



THE STAG, OR RED-DEER

CHAPTER XI

Seals, Whales and Porpoises

We have two species of seals which breed regularly around the shores of the British Isles, namely, the grey or Atlantic seal, and the common seal. Several others visit British waters, as do likewise many whales, porpoises and dolphins. All these sea creatures are true mammals and suckle their young in the typical mammalian manner, but the whales and so on are creatures of the open ocean, and come so little within the view of the ordinary nature-lover that I shall begin with those most interesting beasts, the seals, which do love the shore.

These animals may be seen, often in fair numbers, both on the shallow mud-flats of our eastern seaboard and on the rocky coasts of Wales, Scotland and Ireland. But, speaking roughly, it is the smaller common seal, *Phoca vitulina*, which is met with on the North Sea side, and the large Atlantic, or grey seal, *Halichærus grypus*, which, as its one name suggests, enjoys the long swell of the Atlantic rollers.

This generalisation has its exceptions. There are breeding-places of the Atlantic seal in the North Sea, and there are records of the common seal in the Atlantic, but it does indicate the general distribution of these two seals about British shores, and where they are most likely to be found.

Neither of these seals is an animal that wanders afar. They are both coastal in their habits and have their headquarters and hunting grounds as much as the foxes and badgers in the woods; but whereas the latter hunt rabbits, etc., the seals pursue fish, and whereas the foxes lie up in burrows and in brakes, the seals take their rest on sandbanks and rocky islets.

The most obvious difference between the two species is that of size, the common seal being about four to five feet in length, while the grey seal may be as much as nine feet from nose to hind-flippers. Both are dappled and spotted, but the latter is usually more grey and white, though this is not a reliable distinction, for coat colour varies much in both seals.

Once, on the island of Skomer off the Welsh coast, I watched an almost silver-white female Atlantic seal lying asleep, high and dry on the rocks, with other seals of normal coloration; and on the nearby islet of Grassholm I saw a very large and practically coal-black seal. It looked jet-black as it swam and played in the clear water of a still pool. Once it rose from the seaweed entanglements that waved about the submerged rocks and stood on end in the water, when the sunshine caught its eyes and was reflected by them until they shone with a red light.

In shape of head and body there are decided differences between our two seals. The smaller common seal is a rounder animal with a more bullet-shaped head, while the Atlantic seal has a longer cranium and a profile like that of a retriever dog. Both species rise from the waves to stare at the intruder with a wistful, soulful expression, as if oppressed by all the mysteries of the oceans and the ages, that goes far to account for the old legends of mermaids. But neither seal lacks wariness, and at the least alarm it dives headlong into the depths—often striking the water with its hind flippers as it does so, and thus producing a resounding smack.

Although the common and grey seals are really very different animals, they are not easy to identify for certain when disporting themselves in the water. But there is one thing over which confusion is impossible. Any seal seen with a pup in May or June is certainly a common seal, for the Atlantic seal does not have its young until the autumn. Its little ones are indeed babies of the equinoctial gales.

Just when the Atlantic is brewing its worst storms, when the black clouds race up out of the west, and wind and rain batter our coasts, when the rollers crash in force and fury upon the rocks, and the gale carries the flying spray far inland, the seal mothers seek the caves of the Cornish coast, nooks and corners elsewhere, lonely islets in the Hebrides and other such retreats, and give birth each to her single offspring.

The young seal is a substantial baby and is clad in a white silky coat. It is comparatively helpless and unfit for any attempt to swim, so the mother keeps it from the water for some time, during which period she remains with it as much as possible, guarding it from other jealous seal mothers and from surly old bulls. But as soon as it has shed its white natal coat and acquired the iron-grey dappled velvet jacket

94 GREY OR ATLANTIC SEALS ON SHORE

This photograph, taken on the rocks of an island of the Orkney group, shows a party of Atlantic or grey seals at rest at the edge of the tide. They have been asleep in the sunshine, but their raised heads show they are on the alert, and ready to take the water at the least alarm

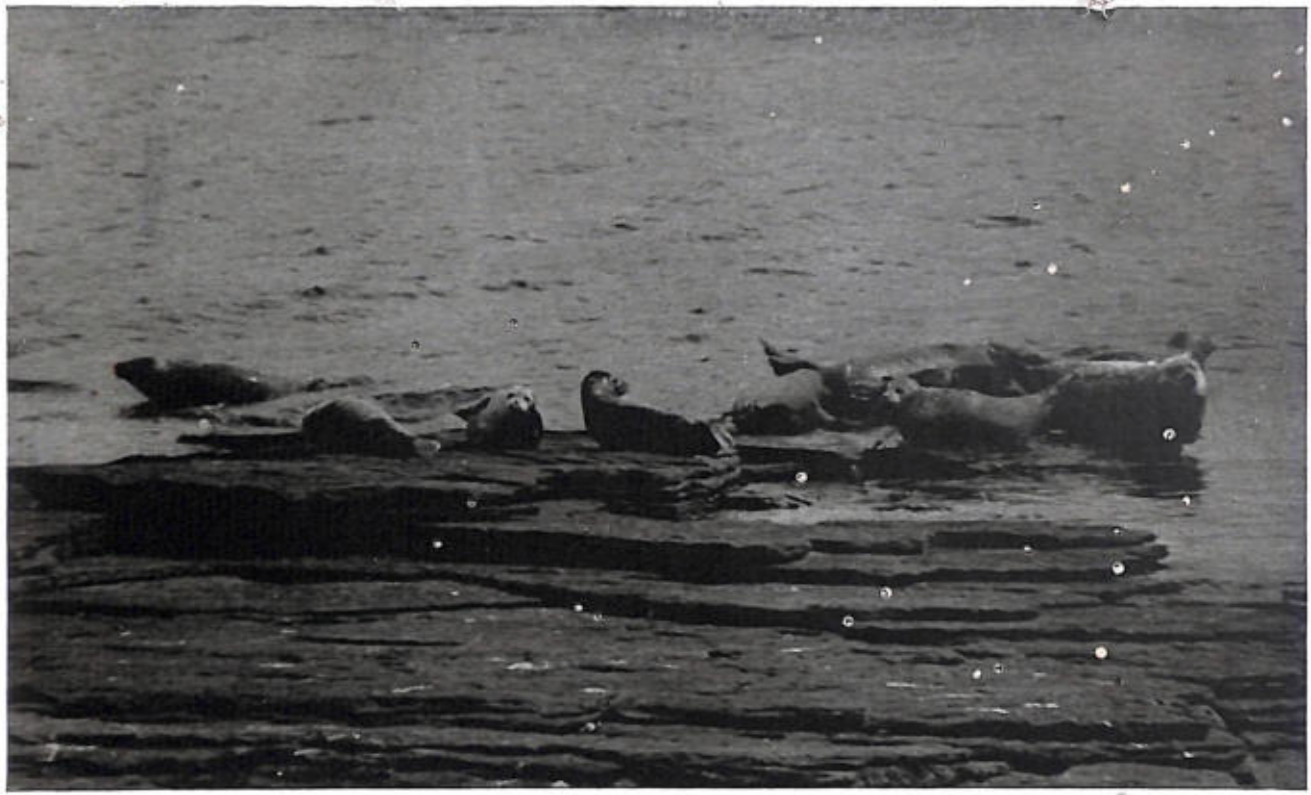
Once, on the island of Skomer off the Welsh coast, I watched an almost silver-white female Atlantic seal lying asleep, high and dry on the rocks, with other seals of normal coloration; and on the nearby islet of Grassholm I saw a very large and practically coal-black seal. It looked jet-black as it swam and played in the clear water of a still pool. Once it rose from the seaweed entanglements that waved about the submerged rocks and stood on end in the water, when the sunshine caught its eyes and was reflected by them until they shone with a red light.

In shape of head and body there are decided differences between our two seals. The smaller common seal is a rounder animal with a more bullet-shaped head, while the Atlantic seal has a longer cranium and a profile like that of a retriever dog. Both species rise from the waves to stare at the intruder with a wistful, soulful expression, as if oppressed by all the mysteries of the oceans and the ages, that goes far to account for the old legends of mermaids. But neither seal lacks wariness, and at the least alarm it dives headlong into the depths—often striking the water with its hind flippers as it does so, and thus producing a resounding smack.

Although the common and grey seals are really very different animals, they are not easy to identify for certain when disporting themselves in the water. But there is one thing over which confusion is impossible. Any seal seen with a pup in May or June is certainly a common seal, for the Atlantic seal does not have its young until the autumn. Its little ones are indeed babies of the equinoctial gales.

Just when the Atlantic is brewing its worst storms, when the black clouds race up out of the west, and wind and rain batter our coasts, when the rollers crash in force and fury upon the rocks, and the gale carries the flying spray far inland, the seal mothers seek the caves of the Cornish coast, nooks and corners elsewhere, lonely islets in the Hebrides and other such retreats, and give birth each to her single offspring.

The young seal is a substantial baby and is clad in a white silky coat. It is comparatively helpless and unfit for any attempt to swim, so the mother keeps it from the water for some time, during which period she remains with it as much as possible, guarding it from other jealous seal mothers and from surly old bulls. But as soon as it has shed its white natal coat and acquired the iron-grey dappled velvet jacket



94 GREY OR ATLANTIC SEALS ON SHORE

This photograph, taken on the rocks of an island of the Orkney group, shows a party of Atlantic or grey seals at rest at the edge of the tide. They have been asleep in the sunshine, but their raised heads show they are on the alert, and ready to take the water at the least alarm

95 This portrait of an old seal resting on a rocky couch shows the long head and "Roman nose" of its species

96 Even in this young pup, yet in its silky-white natal coat, the long head and nose are apparent

such as its parents wear, she ceases to worry so much. The youngster then takes to the water as its natural element.

Seals have few enemies around the shores of Britain except man, the weather and themselves. Now and again irate fishermen, jealous of such efficient competitors, take fearful toll; petty feuds between the old seals when at the breeding-places are sometimes fatal to the helpless pups; and the violent storms of October often account for many infants. They are washed away, drowned and battered to death. I found three dead baby seals washed up on the shore of Ramsay Island after a spell of severe weather.

But the autumn gales, even if an occasional danger, are often a great protection, for they ensure privacy for the seals and keep inquisitive and possibly dangerous visitors away. Most Atlantic seal breeding-places are inaccessible except in the finest of weather, and need anti-cyclonic conditions before a boat can approach them. After all, the Atlantic and the wild storms it brews at the equinoctial period do more for the safety of the seals than they do harm.

The common seal, as already remarked, prefers shallow waters—it is believed to have an especial liking for the flounders and other flat fish found in such places—and takes its rest upon the sandbanks that rise as the tide retreats, using these too for breeding-places, where the little ones may be seen on a fine midsummer day.

The great Atlantic seal is a wary fellow, quick to sense human approach and careful not be be caught ashore, being evidently helped thereto by keen ears and a sensitive nose. Although seals have no external ear, and the ear orifice is covered with waterproof hairs, they have remarkable hearing. Several times I have watched seals from high cliffs, looking down on happily sleeping parties from three and four hundred feet above, and seen them aroused from their rest by a quietly-spoken remark. I remember some common seals and their little ones on a Shetland shore, and how two of us, lying above on the cliff-head, whispered to each other, which sound was evidently carried to the seals and was heard above the moaning of the waves, for, in an instant they were up and off, caterpillaring their way into the sea and only pausing to look back when well out in the water.

Yet quick and wary as were these seals, cautious as are the Atlantic seals, I do not think any of them are more wide-awake

than the seals of the sandbanks of the Wash. It was these seals I had in mind when I referred to seals being left on the banks by the outgoing tide. Considerable herds of common seals haunt this estuary. I have seen parties of sixty, seventy, a hundred, and more, sunning themselves very happily, but they do not let a boat get too near, and when it turns in their direction lose little time in humping themselves down the sandy slope and into the water, leaving broad tracks behind them to show the way they came.

Phoca vitulina is a more gregarious species than *Halichœrus grypus* and assembles in much larger gatherings, but the Atlantic seal likes company and is far from solitary in disposition.

Young ones of both species are attractive little things and have this in common with the human baby, that they weep when frightened and upset.

There was a young grey seal that I surprised asleep in the corner of a sheltered cove. It was not a white-coated infant, but a well-grown, portly youngster in dappled grey velvet, and when it awoke to find me between it and the sea it tried to make off. It came straight at me, heaving itself over the slippery, seaweed-covered stones in a most determined manner, but I grabbed it by the hind flippers and stopped its retreat. The youngster was much upset. It wriggled around and tried to bite—its teeth were already formidable—and then it cried, weeping piteous tears that ran copiously down its face. I took a photograph and then let it go to wash away its grief in the sea.

This seal also showed its perturbation by closing its nostrils and holding its breath. Seals have the power, no doubt a necessity for long diving, of shutting their noses, the nostrils closing tightly and effectually preventing water rushing in and entering the lungs.

Seals can stay under water for many minutes. I watched an Atlantic seal busy fishing and found the average duration of its dive was five minutes, after which it came up to breathe, rest, and survey the upper scene, before plunging again into the depths.

There is a good deal of difference of opinion as to which species of fish are preferred by the Atlantic and by the common seal, but it may be suspected that large and voracious animals such as these are glad to take what comes along, and that their diet is largely governed by what they can get.

97 The common seal is distinguished from the grey or Atlantic seal by its much more rounded head and slightly upturned nose

98 This seal is smaller than the great Atlantic seal, but the round head is the most useful means of distinction

THE COMMON SEAL

99 A back and a fin glimpsed from a fishing-boat may belong to any one of the several species that visit us

100 But *these* fins that cleave the waves are certainly those of bottlenosed whales, a common species off our shores

That seals devour quantities of fish is unquestionable. It is no wonder that fishermen detest them, yet such is the bounty of the oceans that it is doubtful if the presence of a few hundreds, or even a few thousands of seals up and down our coasts makes much difference to "the harvest of the seas."

Although the seal is a wonderful example of adaptation to marine life, in which the limbs of the typical mammal have become converted into flippers, it has not gone so far in the fish-like direction as the whales, porpoises and dolphins. For one thing it still retains a thick furry coat which the latter have long lost. But before going on to survey this last group I must mention certain seals which are sometimes seen in British waters, though never known to breed with us. These are the harp seal *Phoca grœnlandica*, the ringed seal *P. hispida*, and the hooded seal *Cystophora cristata*. All three are Arctic animals, dwelling in the northern seas, on the ice floes and the shores of the lands of the Polar Regions, and they come only to the coasts of Britain and Ireland as stragglers from their Arctic haunts.

The ringed seal is a small animal, similar to, but somewhat less in size than, the common seal, and it owes its name to its blackish-grey fur being marked with oval whitish rings.

The harp seal is somewhat bigger and is distinguished in the case of the males by a "somewhat harp-shaped or crescentric blackish mark crossing the shoulders and extending down each flank, and the muzzle is also dark-coloured," as we are told by Professor Lydekker in his *British Mammals* (p. 156).

The hooded seal is yet bigger, equalling the grey seal in size, and is, like it, a dark dappled grey, but the male has a strange characteristic which is truly distinctive. It has a bladder-like sac on the nose that it inflates in moments of excitement such as those breeding-season combats when bull fights with bull for the females he wishes to add to his harem. Alas! there is no hope of seeing such duels taking place about our shores, for the rare hooded seals which come to us, likewise the few harp and ringed seals, are solitary individuals which have strayed from their home in the north.

Another inhabitant of the frozen north which we find on lists of British mammals is *Odobenus rosmarus*, the walrus, but whatever may have been the case during those ancient times when our climate was colder—walrus remains have been found in various deposits—this animal has now no real claim

to be called British. Its place on our faunal lists rests upon a few reported occurrences, mostly early in the last century, of animals driven by accidental circumstances into a region to which they had no claim to belong.

We now leave the sub-order *Pinnipedia* which is a division of the *Carnivora*—the seals and walruses have, despite their outward unlikeness, much in common with such familiar quadrupeds as the cat, fox and dog—and turn to the order *Cetacea*, which embraces those highly specialised marine mammals the whales, porpoises and dolphins, animals that have departed far further from the land mammal type than the aforesaid seals, and provide us with some remarkable examples of adaptation to aquatic existence, but which remain nevertheless essentially mammals and suckle their young as does the cow her calf.

On the *List of British Vertebrates* published by the British Museum (Natural History), there appear no fewer than twenty-three species of whales and allied creatures. These range from the great blue whale, *Balænoptera musculus*, to the comparatively small common dolphin, *Delphinus delphis*. The former, the largest of living animals, may be as much as 100 feet in length; the latter is no more than seven or eight feet.

It is difficult for the person unacquainted with such creatures to realise that these streamlined, amazingly fish-like inhabitants of the sea, often of enormous size, are not merely mammals in a technical sense, but are air-breathing, warm-blooded animals, with all the devotion to their young, characteristic not only of the seals, but of the land mammals about us. It is true that their fore-limbs have been converted into paddles, and that all external signs of hind-legs have vanished, but their internal structure betrays their affinity with the creatures of dry land, even when some of their adaptations seem to have carried them far apart. The baleen or whalebone of the whalebone whales is an example. This horny substance grows in great plates in the mouth, where its frayed margins make a sieve through which the water filters and leaves behind it the small organisms on which these monsters live, for, despite their great size, the whalebone whales live on little things. They make up, however, for the minute size of their quarry by the quantity of organisms they consume.

Six species of whalebone whales are known in British waters

and were taken off our coasts when whaling was a British industry. There are no whaling stations now in Britain, but they have only closed down during the present century. In 1922 I visited that at Olna Firth in the Shetlands. It was then in full operation.

Two things remain especially vividly in my memory: first the smell and secondly the birds. The smell was apparent from afar, a strong, all-pervading stench which seemed to penetrate oneself and one's belongings and remain with one for many subsequent days. But this smell had no deterrent effect on the gulls, crows and ravens—their indifference was good evidence as to the absence in birds of any olfactory sense worth mentioning—which were present in incredible numbers. The hillsides were white with gulls, satiated with whale fat and meat and sleeping off their orgy; the air was full of wheeling birds, and the waters of the voe, stained red with whale blood, were thickly dotted with gulls, as were the carcasses of the whales, inflated until they looked like balloons, that were moored in the firth and lay waiting their turn to be dragged up the slipways, cut up, put in the great boilers and simmered until the oil was extracted.

Despite the gruesomeness of it all, the whaling station was a place of great interest. One saw the baleen or whalebone being cut from the huge jaws, one saw the blubber or fat and one was able to study the anatomy of the gigantic creatures. Some idea of the size of the larger whales was gained when viewing the entrance gates to the manager's house, which was arched by two ribs, still attached to a vertebral bone, perched high overhead on the curved ribs.

It is good to know that now the taking of whales within the coastal waters of the United Kingdom has been totally prohibited; the commercial exploitation of these monsters of the seas always seemed a pathetic affair to those who admire animal life. "Between 1904 and 1914, 109 blue whales, 2,409 fin whales, 31 humpbacks, and 1,181 sea whales were taken at the Scottish whaling stations," says Mr. F. C. Fraser (*Romance of Nature*, p. 304), who has made an especial study of whales.

By the way, in addition to *Balænoptera musculus*, the great blue whale, other whales known in our seas are *B. physalus*, the fin whale; *B. borealis*, the sea whale; *B. acuto-rostrata*, the lesser rorqual; *Balæna glacialis*, the North Atlantic right whale,

sometimes called the Biscay right whale; and *Megaptera nodosa*, the humpback.

The fin whale, or common rorqual, comes next in size to the great blue whale, and may be as much as 80 feet in length; but length does not give so good an idea of the size of these monsters as does weight. A blue whale 89 feet long "weighed piece by piece, totalled more than 119 tons" (F. C. Fraser, *op. cit.*, p.304), and no doubt a fin whale would weigh quite as much. Yet these monsters breed at sea, and their gigantic babies, often over 20 feet in length, are brought up in the unsheltered water of the open ocean.

After the huge giants of the family *Balænidæ*, the toothed whales, *Physeteridæ*, of which five species occur around Great Britain and Ireland, seem small animals. Except for the sperm whale, *Physeter catodon*, the male of which may grow to 60 feet in length, none of them usually exceed 30 feet.

The sperm whale is a mammal of the warmer seas, and only comes to us as an exceptional visitor, but the bottle-nosed whale, *Hyperoodon rostratus*, is better known here, for one reason because it has the unfortunate habit of venturing too near shore and frequently getting helplessly aground. Stranded individuals have been found at one time and another on nearly every part of our coasts. Perhaps it is their partiality for cuttle-fish which causes them to get into such precarious and often fatal positions, for this group of whales lives very differently from the baleen whales with their great sieves for the gathering of minute organisms from the water.

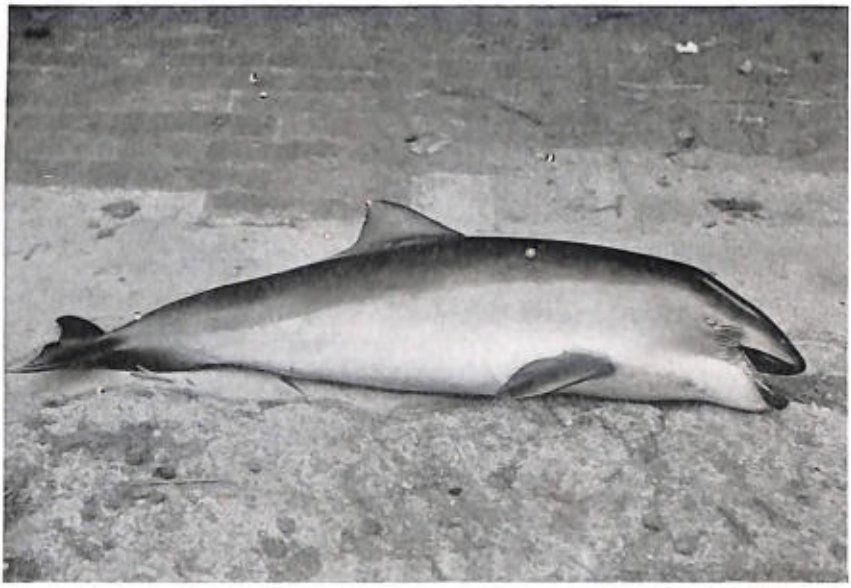
The three remaining whales of this group, *Mesoplodon bidens*, Sowerby's whale; True's whale, *M. mirum;* and Cuvier's whale, *Ziphius cavirostris*, are species that only come here by chance, though now and again a stray one gets stranded on some beach.

Finally, we come to the considerable group of dolphins, which included the common porpoise, *Phocæna phocæna*, perhaps one of the best known of sea mammals, for not only is it plentiful, but it is fond of coastal waters, and will even enter harbours and sea lochs, here to disport itself with joyous abandon, showing itself on the surface at frequent intervals and doing its headlong, characteristic dives. It may be known from its allies by its triangular and not recurved dorsal fin and by its comparatively blunt nose. The common

101 A whale in the North Sea. A fin above water is as much as we usually see of whales off British shores

102 But now and again whales get stranded, as in the case of this rorqual which came ashore on these rocks

103 Pilot whales, or blackfish, that have come too near shore and got stranded on the mud



104 The common porpoise: a wonderful example of a mammal adapted to a marine life

dolphin, *Delphinus delphis*, for instance, has a beak-like snout, and its dorsal fin is distinctly recurved. This last species has a particularly good outfit of teeth, some forty or fifty pairs being distributed along its jaws. It, the common porpoise, and the succeeding species, the bottle-nosed dolphin, *Tursiops truncatus*, are all blackish above and white or light-grey below; and all are of most gregarious disposition, delighting in the society of their fellows and going about in large schools, often hundreds strong.

We have little or no clue to the intelligence, abilities and mentality of these marine mammals, but their love of company is suggestive, as is the curiosity they display towards strange things in the water—for it is only the dull-witted being that is indifferent to what is new.

Risso's dolphin, *Grampus griseus;* the white-backed dolphin *Lagenorhynchus albirostris;* and the white-sided dolphin, *L. acutus*, need not detain us long, because they are not usual inhabitants of British waters. They come now and again, often in large schools, but they cannot be claimed as regular visitors even in our northern waters.

A common species in the north, particularly about the Orkneys and Shetlands, is the black-fish, or pilot whale, *Globicephala melæna*, which, as its name indicates, is of a general black hue save for a whitish stripe along its underparts. This is a biggish creature, often reaching 20 feet in length, and is as sociable as, or more so, than the majority of its relatives, for it is usually met with in great schools or herds of many hundreds of individuals. Its very numbers are sometimes a source of danger to it, as when the fishermen, desiring whale oil and taking to their boats, get between a school and the open sea, and drive the animals ashore; but pilot whales, also false killers, often get stranded without any such cause.

The false killer, *Pseudorca crassidens*, which usually keeps to the open sea, and which also assembles in large companies, has, on many occasions, been the victim of chance mishaps, as in the case of the great school which went ashore in the Dornoch Firth in 1927, when 150 individuals found themselves stranded, powerless to get off, and died miserably in consequence, not even benefiting anyone by so doing and becoming instead a horrible nuisance as their great bodies began to decompose.

I have suggested that whales and dolphins are creatures of some, if not considerable, intelligence, so the reader will no doubt ask how such seemingly stupid happenings can be accounted for. The answer seems to be that these social oceanic animals have a strong tendency to follow a leader, and if the head of the school swims into a land-locked bay or other narrow piece of sea, they all follow. But when they find themselves in a narrow space they are apt to lose their heads, dash madly about and get into sore trouble.

There is one sea beast which is ever ready to take advantage of the troubles of its fellows, at least, when such troubles overtake them at sea, and which will even attack without provocation, and that is the terrible wolf of the seas—the killer or grampus, *Orcinus orca*. This ferocious member of the dolphin group is as terrible to the creatures of the ocean as the stoat is to rabbits in a field. It will attack and kill other dolphins and porpoises, also seals, and a party of killers does not hesitate to go for a big whale, worrying the poor thing and tearing chunks of blubber and flesh from its sides until it eventually succumbs. The killer is, of course, no small animal, being often 20 feet or more in length. It is black on the back, white below, and has a white spot over the eye. Its tall back fin is noticeable in the water.

We must leave the horrible killer to its fell work, and before concluding mention the white whale or beluga, *Delphinopterus leucas*, and the narwhal, *Monodon monoceros*, both relatives of the dolphin group, but known here only as rare visitors from the Arctic seas, though both, when they do come, are easily recognised. The first is a 10 to 12 feet animal of pure white colour, and the other, of grey hue, has the remarkable distinction of a unicorn-like tusk projecting before it. This single tooth, spirally-twisted—its fellow remains undeveloped—grows from the left side of the upper jaw of the male and often attains a remarkable length—truly a weird embellishment and implement of offence.

This completes our tally of the British whales, porpoises and dolphins, also of our British mammals as a whole, which if not of great number, certainly embraces a diversity of species.

Index

(The numerals in italic type refer to the *figure numbers* of illustrations)